



CYPRUS UNIVERSITY OF TECHNOLOGY
FACULTY OF GEOTECHNICAL SCIENCES
AND ENVIRONMENTAL MANAGEMENT

ACTIVITY REPORT 2022-2024

Limassol
2025

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Πίνακας Περιεχομένων

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Welcome Message

Dear Readers,

On behalf of the Faculty of Geotechnical Sciences and Environmental Management, its Academics and all its Staff, I would like to welcome you to the “Activity Report 2022-2024” of our Faculty. Our Faculty is currently composed of the following two Departments: the Department of Agricultural Sciences, Biotechnology and Food Science and the Department of Chemical Engineering. It is the only School of its kind in Cyprus and is tasked with covering subjects that are at the heart of the contemporary social and environmental challenges we face. The fields of agriculture and food are becoming increasingly significant as we are tasked with meeting the nutritional needs of a growing global population without causing irreversible damage to the planet's ecosystems and human health.

Protecting the environment and natural resources, especially in the context of climate change, which is directly linked to our standard of living, requires cooperation amongst many scientific disciplines. Our Faculty covers topics from the natural and technological sciences, such as Chemistry, Physics, Microbiology, Toxicology and Biotechnology, with emphasis on the environmental and agronomic aspects of these sciences. We also want to highlight the economic and management dimension of the problems we face.

Since its establishment, one of the Faculty's main objectives is the active participation in the scientific and economic development of our country. We do not only want to follow, but also play a leading role in the great changes that are taking place, which naturally include new agricultural and environmental technologies. For us as a Faculty, cooperation with industry is crucial and is a priority towards the realization of our strategic goals.

Finally, I would like to wish all those who have graduated to have successful and fulfilling careers, as well as good luck to those who are continuing their studies with us. Our Faculty will be here and will continue to support you, being a place of education, spirituality, communication, humanity, cooperation and creativity.

George Botsaris
Associate Professor
Dean of the Faculty

Χαιρετισμός

Αγαπητοί Αναγνώστες και Αγαπητές Αναγνώστριες,

Εκ μέρους της Σχολής Γεωτεχνικών Επιστημών και Διαχείρισης Περιβάλλοντος (ΓΕΔΙΠ), των Ακαδημαϊκών και όλου του Προσωπικού της, επιθυμώ να σας καλωσορίσω στην «Έκθεση Πεπραγμένων 2022-2024» της Σχολής μας. Η Σχολή ΓΕΔΙΠ απαρτίζεται στην παρούσα φάση από τα εξής δύο Τμήματα: το Τμήμα Γεωπονικών Επιστημών, Βιοτεχνολογίας και Επιστήμης Τροφίμων και το Τμήμα Χημικών Μηχανικών. Είναι η μοναδική Σχολή στο είδος της στην Κύπρο και καλείται να καλύψει γνωστικά αντικείμενα που βρίσκονται στην καρδιά των σύγχρονων κοινωνικών και περιβαλλοντικών προκλήσεων που αντιμετωπίζουμε. Οι τομείς της γεωργίας και των τροφίμων αποκτούν ολοένα και μεγαλύτερη σημασία, αφού καλούμαστε να καλύψουμε τις διατροφικές ανάγκες ενός αυξανόμενου παγκόσμιου πληθυσμού, χωρίς να προκαλούμε ανεπανόρθωτη ζημιά στα οικοσυστήματα του πλανήτη, αλλά και στην ανθρώπινη υγεία.

Η προστασία του περιβάλλοντος και των φυσικών πόρων, κυρίως σε συνθήκες κλιματικών αλλαγών που είναι άμεσα συνυφασμένες με το βιοτικό μας επίπεδο, απαιτεί συνεργασία μεταξύ πολλών επιστημονικών κλάδων. Η Σχολή ΓΕΔΙΠ θεραπεύει γνωστικά αντικείμενα των θετικών και τεχνολογικών επιστημών, όπως η Χημεία, η Φυσική, η Μικροβιολογία, η Τοξικολογία και η Βιοτεχνολογία, με έμφαση στις περιβαλλοντικές και αγρονομικές πτυχές των επιστημών αυτών. Θέλουμε, επίσης, να αναδείξουμε την οικονομική και διαχειριστική διάσταση των προβλημάτων που καλούμαστε να αντιμετωπίσουμε.

Η Σχολή ΓΕΔΙΠ από την ίδρυσή της μέχρι σήμερα έχει ως έναν από τους βασικούς της στόχους την ενεργή συμμετοχή στην επιστημονική και οικονομική ανάπτυξη της χώρας μας. Δεν θέλουμε μόνο να παρακολουθούμε, αλλά και να πρωταγωνιστούμε στις μεγάλες αλλαγές που διαμορφώνονται, που περιλαμβάνουν φυσικά και νέες γεωργικές και περιβαλλοντικές τεχνολογίες. Για εμάς ως Σχολή, η συνεργασία με τη βιομηχανία είναι πολύ σημαντική και αποτελεί προτεραιότητα προς την υλοποίηση των στρατηγικών μας στόχων.

Τέλος, θέλω να ευχηθώ σε όλα τα παιδιά που έχουν αποφοιτήσει επιτυχημένα και δημιουργική σταδιοδρομία, καθώς και καλή συνέχεια στα παιδιά που συνεχίζουν τις σπουδές τους. Η Σχολή ΓΕΔΙΠ θα είναι εδώ και θα συνεχίσει να σας στηρίζει, αποτελώντας ένα χώρο εκπαίδευσης, πνευματικότητας, επικοινωνίας, ανθρωπιάς, συνεργασίας και δημιουργίας.

Γιώργος Μπότσαρης

Αναπληρωτής Καθηγητής του Τμήματος Γεωπονικών Επιστημών, Βιοτεχνολογίας και Επιστήμης Τροφίμων

Κοσμήτορας Σχολής Γεωτεχνικών Επιστημών και Διαχείρισης Περιβάλλοντος

The Faculty and its Departments

I. The University (www.cut.ac.cy)

The Cyprus University of Technology (CUT) is a newly established public university, which was founded by law in December 2003. It constitutes one of the three state universities operating in the Republic of Cyprus. CUT has seven (7) Faculties and fifteen (15) academic Departments, able to offer education and high-level research in primary fields of science and technology, at undergraduate and postgraduate levels. Currently, the university educates about 3,200 students and includes an academic and administrative staff of about 920 people.

Although it initiated its research activity recently, CUT already participates in a significant number of research projects funded by national authorities and European programmes, such as Research Framework Programmes FP7, Horizon 2020 and Horizon Europe (including one prestigious grant from the European Research Council); the LIFE Programme, ERASMUS+, European Territorial Cooperation Programmes such as Interreg, Archimed, MED etc. The University has adopted research principles which conform to the European Union's declarations on the creation of the European Research Area (ERA).

Despite its short history, the University has already been ranked 601-800th in the World University Rank 2024 and 148th in the Young University Rankings 2024. Moreover, it has been ranked in the highly honourable 47th place in the Times Higher Education World's Best Small Universities 2024. This highlights the University's devotion to quality research and teaching, and motivates its staff for higher international achievements.

The University's Faculties are the following:

1. The Faculty of Geotechnical Sciences and Environmental Management
2. The Faculty of Management and Economics
3. The Faculty of Engineering and Technology
4. The Faculty of Health Sciences
5. The Faculty of Fine and Applied Arts
6. The Faculty of Communication and Media Studies
7. The Faculty of Tourism, Hospitality and Entrepreneurship

The Faculty of Geotechnical Sciences and Environmental Management, which is presented in this report, currently consists of two Departments: the Department of Agricultural Sciences, Biotechnology and Food Science; and the Department of Chemical Engineering. Brief information about each Department is provided below.



II. The Department of Agricultural Sciences, Biotechnology and Food Science

(www.cut.ac.cy/abf)

The Department of Agricultural Sciences, Biotechnology and Food Science (ABF) was established and accepted its first students in 2007. By that time, the Department's staff was comprised of two (2) faculty members, two (2) members of Special Teaching Staff and one (1) clerical officer. Professor Nicolas Ioannou, who retired in September 2013, acted as the first Coordinator and later as the first Chair of the Department, followed by Associate Professor Christakis Papachristoforou (2012-2014), Professor Andreas Katsiotis (2014-2020), and Associate Professor Despoina Miltiadou (2020-2022). Within the remit of the Department's first Coordinator was the appointment of additional faculty members, as well as the coordination with external advisory committees for the development of the Department's programmes of studies. The programmes have been accredited by the Council of Agriculturists and the Cyprus Registration Board for Food Scientists, Food Technologists and Dietitians.

ABF offered its first undergraduate programme in 2007. The Department is admitting around 40 students per academic year through national examinations and offers a B.Sc. degree in Agricultural and Food Sciences with specialization in three basic areas: **(a) Crop Science & Technology, (b) Animal & Dairy Science and (c) Food Science & Technology.** For awarding the B.Sc. degree of the Department of Agricultural Sciences, Biotechnology and Food Science, students are required to complete 240 European Credit Units (ECTS).

In September 2011, the Department began offering its postgraduate programme leading to the award of the degree of **Master of Science (M.Sc.) in Agricultural Biotechnology.** The M.Sc. programme has a duration of 18 months (three semesters) and accepts around 15 students per year, distributed in the three main areas of Plant, Animal and Food Biotechnology.

The first undergraduate students successfully obtained their degrees in June 2011. The first M.Sc. degrees were awarded in 2013. The Department awarded the first doctoral title in 2012, followed by an additional two doctoral titles in 2014 and another seven during 2016-2018. By mid-2018 there were 22 PhD students in the Department.



ABF is housed in well-equipped and well-maintained **laboratory facilities.** Through public funding (approx. 2.5M Euro), adequate infrastructure was purchased to support both teaching and research. The Department is also using a greenhouse located in the broader area of Limassol. Furthermore, two experimental farms have been acquired in the area of Lofou and in the area of Acheleia.

III. The Department of Chemical Engineering

(<https://www.cut.ac.cy/faculties/gem/est>)

The Department was officially established in January 2008 under the name of 'Environmental Management'. In September 2010, the Department's name was formally changed to 'Department of Environmental Science and Technology' (EST), and its undergraduate degree was **B.Sc. in Environmental Science and Technology**. Until the discontinuation of the programme in 2017, two hundred and six (206) students graduated with a B.Sc. In addition, the Department offered two M.Sc. programmes, with a hundred and four (104) graduates in Energy Resource and Management and fifty (50) graduates obtained an M.Sc. in Environmental Bioscience and Technology. In 2017, the Department joined forces with the University's Faculty of Engineering and Technology and started offering a **B.Sc. programme in Chemical Engineering**, the first University degree in Chemical Engineering offered in Cyprus, while the Department's name was formally established as 'Chemical Engineering' in 2019. The programme has been accredited by the Cyprus Agency of Quality Assurance and Accreditation in Higher Education (ΔΙΠΑΕ) and it has been recognised by the Technical Chamber of Cyprus (ETEK).

The Department currently admits 25-30 undergraduate students every year. The first Chemical Engineering students were admitted in September 2017 and graduated in June 2021. Since 2022, sixteen (16) students graduated with a B.Sc. in Chemical Engineering. The Department has built strong ties with the industry of Cyprus both in research and education, and includes a mandatory practical training of all senior students in industrial plants. The Department offers an impressive national and international network of industrial contacts and has strong collaborative links with other university departments in Cyprus and abroad. Furthermore, the Department offers doctoral degrees and until summer 2022, nineteen (19) doctoral students had graduated with a Ph.D. The M.Sc. programme is currently re-designed in order to be in line with the educational priorities of the undergraduate Chemical Engineering programme and with the research priorities of the Department's staff.

The Department of Chemical Engineering, although young, has a diverse portfolio of academic courses and research projects attracting high-calibre staff and students alike who wish to expand a career in chemical reaction engineering, biotechnology, fluid engineering, material science, the environment and the energy sector.



EST has extensive and modern **laboratory facilities** worth more than 1.5 million Euros. Adequate infrastructure was purchased to support both teaching and research needs, initially thanks to public funding and later as a combination of public University funds and research infrastructure acquired by the Department's academic staff through competitive research grants. These facilities are continuously upgraded, in order to address all educational needs of the new Chemical Engineering programme.

Personnel*

I. Department of Agricultural Sciences, Biotechnology and Food Science

| <u>Name</u> | <u>Rank</u> | <u>Specialty</u> |
|-------------------------------|------------------------|---|
| Katsiotis, Andreas | Professor | Plant Breeding/Plant Genetics |
| Tsaltas, Dimitrios | Professor | Agricultural Microbiology & Biotechnology |
| Miltiadou, Despoina | Professor | Animal Science/Molecular Biology |
| Fotopoulos, Vasileios | Professor | Plant Physiology |
| Manganaris, Georgios | Professor | Arboriculture/Postharvest Physiology and Technology |
| Stavrinides, Menelaos | Associate Professor | Entomology/Acarology |
| Papademas, Photis | Associate Professor | Dairy Science and Technology |
| Tzamaloukas, Ouranios | Associate Professor | Animal Science/Nutrition |
| Tzortzakis, Nikolaos | Associate Professor | Vegetable Crops/Aromatic plants/Postharvest Physiology and Technology |
| Kanetis, Loukas | Associate Professor | Phytopathology/Crop Science |
| Botsaris, Georgios | Associate Professor | Food Microbiology |
| Drouza, Chryssoula | Associate Professor | Food Chemistry |
| Goulas, Vlasios | Assistant Professor | Physical Chemistry & Analysis |
| Pantelides, Iakovos | Assistant Professor | Phytopathology/Plant Biotechnology |
| Nikoloudakis, Nikolaos | Assistant Professor | Plant Biotechnology |
| Gadanakis, Georgios | Assistant Professor | Applied Agricultural Economics |
| Mitsiopoulou, Christina | Special Teaching Staff | Animal Science |
| Aspri, Maria | Special Teaching Staff | Dairy Science |
| Christoforou, Michalakis | Special Teaching Staff | Plant Science |
| Christou, Atalanti (*2025) | Special Teaching Staff | Environmental and Food Chemistry |
| Chrysargyris, Antonis (*2025) | Special Teaching Staff | Floriculture/Plant Nutrition |
| Retired: | | |
| Ioannou, Nicolas | Professor | Phytopathology |
| Gekas, Vassilis | Professor | Food Engineering & Technology |
| Papachristoforou, Christakis | Associate Professor | Animal Reproduction |
| Papachristoforou, Christakis | Associate Professor | Animal Science/Reproductive Physiology |
| Georgiades, Costantinos | Academic Staff Member | Principal Instructor |
| Hadjimichael, Panagiotis | Academic Staff Member | Principal Instructor |

* Contact details of each staff member can be found on the corresponding webpage of each Department, which is depicted in the previous Section

II. Department of Chemical Engineering

| <i>Name</i> | <i>Rank</i> | <i>Specialty</i> |
|--|---|---|
| Varotsis, Constantinos | Professor | Environmental Bio-Catalysis |
| Costa, Costas | Professor | Environmental Chemistry & Catalysis |
| Charalambides, Alexandros | Associate Professor | Renewable Energy Sources |
| Daskalakis, Evangelos | Associate Professor | Computational Physics of the Atmosphere |
| Koutinas, Michalis | Associate Professor | Environmental Biotechnology |
| Vyrides, Ioannis | Associate Professor | Environmental Engineering |
| Antoniou, Maria | Associate Professor | Water & wastewater treatment |
| Constantinou, Achilleas | Associate Professor | Chemical Engineering |
| Stephanou, Pavlos | Associate Professor | Chemical Engineering |
| Evripidou, Nikola (*2025) | Assistant Professor | Chemical Engineering |
| Savva, Petros | Special Teaching Staff | Environmental Chemistry & Atmospheric Pollution |
| Koutsoupakis, Constantinos | Special Teaching Staff | Environmental Science |
| Vasquez, Marlen | Special Teaching Staff | Environmental Toxicology & Microbiology |
| <i>Retired:</i> | | |
| Papadopoulos, Ioannist | Professor | Water and Soil Science |
| Serghides, Despina | Professor | Bioclimatic Architecture |
| Theopemptou, Charalambos | Lecturer | Environmental Policy |
| <i>Left:</i> | | |
| Zachariadis, Theodoros | Associate Professor | Energy & Environmental Policy |
| Daskalakis, Evangelos | Assistant Professor | Computational Physics of Atmosphere |
| <i>Administrative Personnel</i> | | |
| Pillatsi, Sonia | Secretary of the Department of Agricultural Sciences, Biotechnology and Food Science (2016-today) | |
| Kiperesi, Zooula | Secretary of the Department of Chemical Engineering (2008-today) | |
| Herodotou, Marina | Secretary of the Faculty (2012-today) | |
| Nikolaidou, Fotini | Faculty Librarian | |
| Eliza Theofanous | Faculty Officer (2022 - today) | |

International Recognition, Outreach Activities & Social Service

As a result of their heavy involvement in international collaboration, the academic staff of our Faculty participates in a large number of national and international associations, scientific committees and advisory groups, related to the topics of their research interests. For example, two Faculty members participated in the Domain Committees of the European COST programme (under its previous structure that changed in 2015), while several others take part as members of the Management Committees of individual COST Actions. Moreover, two members of the Faculty were national representatives of Cyprus in the Programme Committee of Food, Agriculture, Fisheries and Biotechnology of the European Commission's 7th Framework Programme, and in the Programme Committee on Climate Action, Environment, Resource Efficiency and Raw Materials of the European Commission's Horizon2020 Programme, respectively. A previous Dean of the Faculty is a member of the Scientific Committee of the European Environment Agency, the EU organisation that to provide sound and independent information on the environment in order to enable the proper implementation and evaluation of environmental policy.

Moreover, at the initiative of the Faculty's Sustainable Energy Laboratory (SEL), CUT has become a member of the Knowledge and Innovation Community on Climate Change (Climate-KIC) of the European Institute of Innovation and Technology (EIT). Climate-KIC is the largest public-private climate change partnership and main EU initiative to build a low-carbon economy through education, entrepreneurship and innovation.

Similarly, at the initiative of the Faculty's Agricultural Microbiology and Biotechnology Laboratory (AMBL), CUT has become a member of the Knowledge and Innovation Community on Food (EIT Food) of the European Institute of Innovation and Technology (EIT). EIT Food participation mobilised the engagement of faculty and students in multiple projects for entrepreneurship and innovation in agrifood and supported the empowerment of women in agriculture and food production via multiple training initiatives.

In the national scene, due to their expertise, our academic staff is frequently invited to testify in front of Committees of the Parliament of Cyprus, assist the Cyprus Ministry of Education, Sport and Youth in the evaluation of educational programmes of private Universities, and participate in Committees set up by the national authority that is responsible for the recognition of higher education qualifications (ΚΥΣΑΤΣ). They also appear in national media offering expert opinions on topical issues related to agricultural, food, energy or environmental policy; and provide lectures to schools and professional associations on topics of their speciality.

Several members of our staff have gained international recognition and are therefore invited abroad to offer their expertise. For example, in recent years, some staff members have participated in the evaluation process of several Academic Institutions and Departments in Greece by contributing to the work of the Hellenic Quality Assurance Agency of Higher Education (HQAA). Moreover, Faculty staff have acted as evaluators of research proposals for the following organisations:

1. European Commission (COST, FP7, Horizon 2020)
2. European Science Foundation
3. Austrian Science Fund
4. Research Foundation of Flanders, Belgium
5. Research Council of the Katholieke University of Leuven, Belgium
6. Innovation Fund Denmark
7. National Research Agency of France
8. Agriculture and Agri-Food Canada
9. USA-Israel Binational Agricultural Research and Development Fund
10. Israel Science Foundation
11. Ministry of Education of Greece
12. General Secretariat for Research and Technology of Greece
13. National Commission of Scientific and Technological Research of Chile
14. Ministry of Education, University and Research of Italy
15. University of Insubria, Italy
16. University of Pavia, Italy
17. University of Calabria, Italy
18. Investment and Development Agency, Latvia
19. National Science Centre, Poland
20. Foundation for Science and Technology, Portugal
21. Qatar National Research Fund

Members of our academic staff have also served as external examiners of MSc theses and PhD dissertations in the following institutions:

22. University of Antwerp, Belgium
23. Aristotle University of Thessaloniki, Greece
24. University of the Aegean, Greece
25. Sant' Anna School of Advance Studies, Pisa, Italy
26. University of Florence, Italy
27. University of Foggia, Italy
28. University of Teramo, Italy
29. University of Amsterdam, The Netherlands
30. Stellenbosch University, South Africa
31. Tshwane University of Technology, South Africa
32. KTH Royal Institute of Technology, Sweden
33. University of Cranfield, UK
34. University of Cyprus, Cyprus

Our academic staff are Associate Editors or members of the Editorial Board of the following international academic Journals:

- | | |
|--|--|
| 35. Agronomy | 48. Journal of Horticultural Science & Biotechnology |
| 36. Advances in Horticultural Science | 49. Journal of Plant Biology & Soil Health |
| 37. Advances in Oceanography and Limnology | 50. Journal of Post-Harvest Technology |
| 38. BMC Plant Biology | 51. Phytoparasitica |
| 39. Energy Economics | 52. Plant Gene |
| 40. Frontiers in Agricultural Biological Chemistry | 53. Plant Physiology and Biochemistry |
| 41. Frontiers in Crop Science & Horticulture | 54. Plant Signaling & Behavior |
| 42. Frontiers in Microbiology | 55. Postharvest Biology & Technology |
| 43. Frontiers in Plant Abiotic Stress | 56. Recent Patents on Biotechnology |
| 44. Frontiers in Plant Physiology | 57. Small Ruminant Research |
| 45. Gene | |
| 46. Journal of Catalysis | |
| 47. Journal of Experimental Botany | |

Furthermore, several Faculty members have been invited to offer keynote lectures in international conferences and to deliver short academic or training courses abroad.

International conferences and meetings organised by Faculty members in Cyprus in 2022-2024

1. 16th Mediterranean Phytopathological Union Congress – MPU2022 (4th-8th April 2022)
2. VI International Symposium on Post-harvest Pathology: Innovation and advanced technologies for managing postharvest pathogens (29th May – 2nd June 2022)
3. Cyprus Agrifood Entrepreneurship & Innovation organised by CyprusInno and the Cyprus University of Technology in partnership with EIT Food. (December 2023, Nicosia, CyprusInno, D. Tsaltas Co-organizer and Panelist)
4. Member of the Local Organizing and Scientific Committee of the 16th Congress of the Mediterranean Phytopathological Union entitled “Safeguarding Mediterranean Plant Health”, (4-8 April 2022, Limassol, Cyprus - I. Pantelides)
5. President of the Organizing Committee of the 21st Hellenic Phytopathological Conference (4-7 November 2024, Pafos, Cyprus - I. Pantelides)
6. Member of the Local Organizing and Scientific Committee of the 16th Congress of the Mediterranean Phytopathological Union entitled “Safeguarding Mediterranean Plant Health” (4-8 April 2022, Limassol, Cyprus - L. Kanetis)
7. Secretary of the Organizing Committee of the 21st Hellenic Phytopathological Conference, (4-7 November 2024, Pafos, Cyprus - L. Kanetis)
8. Member of the Organizing Committee of the 1st and 2nd Pancyprian Conferences, “Rural Development: From Research to Practice”, co-organized with the Department of Agriculture (Extension Services Section) and the Agricultural Research Institute (24 November 2022 & 16 November 2023) - L. Kanetis

International patents owned in part by members of our Faculty

1. Efstathiou A.M., Costa C.N. & Fierro J.L.G., Novel Catalyst for the NO Reduction to N₂ with the use of Hydrogen Under Lean De-NO_x Conditions. International Patent Cooperation Treaty: WO 03068390 (2002); US Patent: US 2005/0090393 (2006); European Patent: EP 1475149 A1 (2008); Australian Patent: AU 2003206981 A1 (2005); Spanish Patent: ES 2192985 (2003); Japanese Patent: JP2005516767 (2005).
2. Efstathiou A.M., Savva P.G. & Costa C.N., Catalyst Containing Platinum on a Support Consisting of Nano-crystal Magnesium Oxide and Cerium Dioxide Towards H₂-SCR. European Patent No. EP 08010888.8 (2010).
3. Efstathiou A.M., Savva P.G. & Costa C.N., Catalyst Containing Platinum and Palladium for the Selective Reduction of NO_x with Hydrogen (H₂-SCR). European Patent No. EP 08010887.0 (2010).
4. Costa C.N., Valanidou L., Savva P.G. & Theologides C., Novel Catalyst for the NO Reduction to N₂ with the use of Ethanol or Ethanol-Hydrogen Mixtures Under Lean De-NO_x Conditions. European Patent No. 10390001.5/EP10390001 (2010).
5. Kashfi K. & Fotopoulos V., Method of Priming Plants against Abiotic Stress Factors and Promoting Growth. International Patent No. PCT/US15/15380 (2015).
6. *Patent pending*: Tapakis R. & Charalambides A., System and Method for Predicting Solar Power Generation. International Patent Application No. PCT/EP2016/055889 (2016).

Research at the Faculty

I. Department of Agricultural Sciences, Biotechnology and Food Science

Overview

In spite of a substantial load of teaching and administrative work, the academic staff of the Department has been actively involved in numerous research projects and the submission of competitive research grants. Research is additionally boosted thanks to internal funding from the available (though limited) financial resources of the University.

The strengths of ABF for research are the existence of a state-of-the-art analytical/molecular equipment, the willingness of all academic staff to be heavily involved in research initiatives and the existence of a critical mass of active research faculty. It is also noteworthy that the University provides incentives and support to faculty members to participate in competitive research. All these factors have led to a sizable number of publications in peer-reviewed journals with high impact factors, edited books and conference proceedings, as well as an international patent. ABF academic staff members have made a large number of presentations in international scientific conferences. Published results have been widely endorsed by the scientific community, as indicated by the large number of citations in the international literature.

To support its focus on building strong interdisciplinary teams and generating world-class research, the ABF Department has established comprehensive research facilities, which can be broadly categorised according to its three divisions – Crop Science and Technology, Animal and Dairy Science, and Food Science and Technology. The specific divisions and their equipment are the following:

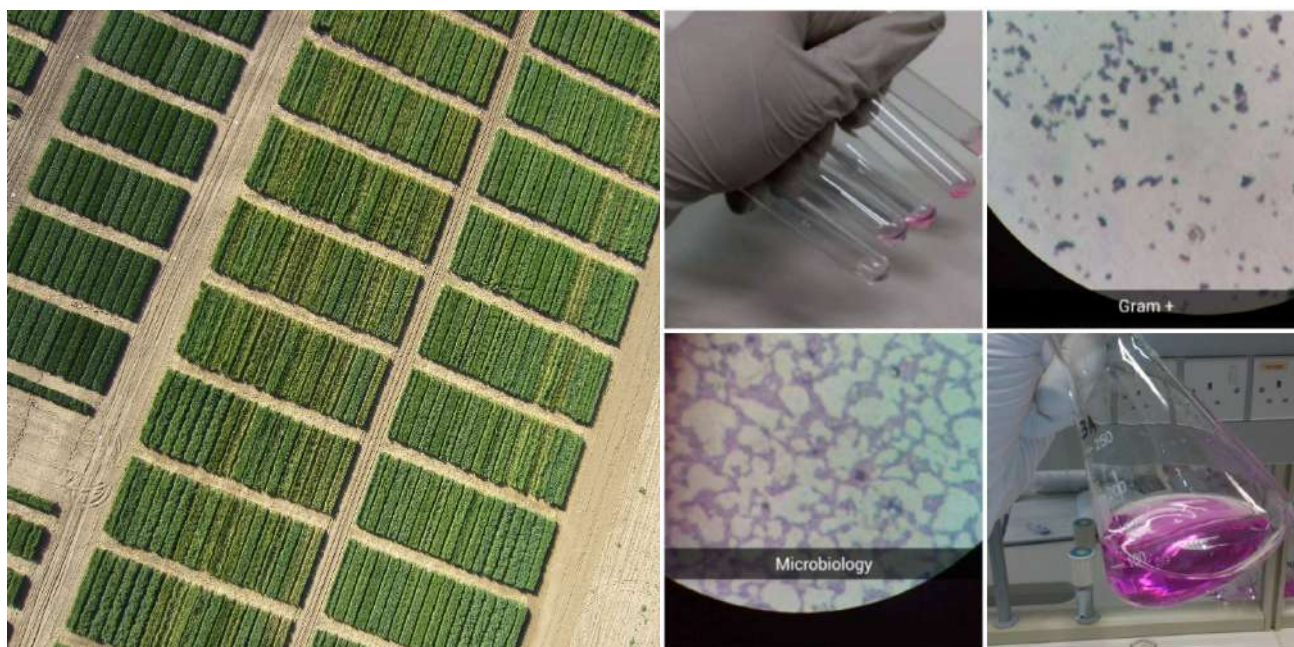
Crop Science and Technology: LiCor 6400 photosynthesis meter, porometer, fluorometer, two plant growth rooms, nitrate/nitrite probe, plant tissue culture incubators, EpiFluorescence Stereo Microscope, EpiFluorescence Microscope, VITEK, Laminar Flow Class II, ABI Genetic Analyser, spectrophotometer plate reader, fluorescence spectrophotometer, ELISA plate reader, PCR, two real time PCR, DNA electrophoresis, protein electrophoresis, 2D-protein electrophoresis, DNA hybridization oven, DNA cross linker, fermentor, nanodrop, gel documentation, MiSeq system for DNA sequencing.



Animal and Dairy Science: Dairy production Unit (cheese vat, cheese pressing equipment), incubator, flow cytometer, laminar flow class II, DNA electrophoresis, PCR, Milkoscan, nano filtration unit, homogenizer, inverted fluorescent microscope, CO₂ incubator.

Food Science and Technology: Soxhlet extractor, texture analyser, spectrophotometer, Gerber, distillators, vacuum packing machine, conductivity meter, water activity meter, automatic titrator, colorimeter, viscometer, fruit firmness tester, sample concentrator, Solid Phase Extraction Unit, Sonicator, bench top refractometer, Kjeldahl Unit, calorimeter, HPLC units (2x), GC-FID, GC-MS, FT-IR spectrophotometer, polarimeter, freeze-dryer.

Other general equipment includes various laminar flows Class I, fume hoods, electrophoresis fridges, incubators, centrifuges, shaker incubators, pH meters, vortexes, RO water, water distillation system, refrigerators and freezers -20°C, -40°C and -80°C. Finally, other Departmental facilities include a chemical storage room and a sterilisation room.



The international committee that conducted an external evaluation of the ABF Department in June 2015 commented “the highly motivated, dedicated, enthusiastic faculty members who have established a very good track record resulting in national and international recognition of their Department” and the Department’s “excellent research infrastructure”. The international committee conducted another evaluation of the ABF Department in November 2020, stating that “the profile of the, relatively young, highly motivated teaching staff is broad and excellently suited to carry out the study programmes”.

The following pages describe briefly the activities carried out by each research group of the ABF Department during the period 2018-2022. Interested parties may obtain more information by accessing the webpages of each group, or the general Departmental webpage (www.cut.ac.cy/abf).



Research Group on Plant Breeding, Plant Genetics and Experimental Design

Head: Andreas Katsiotis, Professor

Team: Andreas Pallides (PhD candidate)

Webpage: <https://www.researchgate.net/profile/A-Katsiotis-2>

Plant breeding is an interdisciplinary science, targeting to improve agricultural productivity, food security, and environmental sustainability. Through plant breeding heritable traits are manipulated to develop new varieties with desirable traits. Plant breeding involves various tools and techniques to improve crop traits. These tools can be categorized into traditional, biotechnological, and modern molecular approaches, including:

- Conventional plant breeding tools (natural selection, crossbreeding, hybridization, mutation breeding, backcross breeding)
- Biotechnological tools (tissue culture, genetic engineering, marker-assisted selection, gene editing)
- Bioinformatics and Data Analysis tools (quantitative trait loci /QTL identification, genome-wide association studies/GWAS, artificial intelligence/AI, and machine learning/ML)
- Field-based tools and technologies (phenotyping platforms, UAVs and remote sensing, Internet of Things/IoTs)
- Seed banks and genetic resources tools (genebanks, cryopreservation)

These tools collectively help improve crop yield, disease resistance, nutritional value, and environmental adaptability, ensuring food production and security.

Plant breeding uses an array of basic knowledge courses, including genetics, botany, crop science, plant pathology, statistics, experimental design, molecular biology, and more advanced courses such as quantitative genetics, population genetics, cytogenetics, and molecular cytogenetics.

Our work aims to integrate knowledge from plant breeding methodologies, molecular cytogenetics, incorporation of traits from wild crop relatives in cultivated species, genome organization, plant phenotyping, plant diversification, molecular markers, plant evolution, biodiversity, field evaluations (NDVI) towards developing plant material suitable for sustainable food production. The Plant Breeding research group has utilized a diverse plant material through the years: (a) *oats* for species and genomic relationships, interspecific crosses for evolutionary studies, species genetic diversity studies, presence of $2n$ gametes, genetic diversity of landraces; (b) *olives* for genomic organization, germplasm characterization, and variety identification; (c) *wheat* for genetic diversity studies, evaluation of germplasm, and genetic stability within landrace and MAGIC populations. Furthermore, species relationships among pistachio varieties, genetic structure and population diversity of edible herbs, and phylogenetic relationships in oregano, have also been studied.

Throughout the years, past members of the group have participated in international and local plant collection missions. Our group is using a number of techniques to accomplish the research described above, including molecular markers, molecular and conventional cytogenetics, flow cytometry, development of interspecific hybrids, field experimentation, genomics, DArT technology etc.

Former PhD students and post-docs are working as university professors around the world, genebank curators, researchers in the public and private sectors, and plant breeders in public research institutes.

Andreas Katsiotis has participated in several international and nationally funded projects as a coordinator or partner. On-going competitive projects include: BIOVALUE (Horizon 2020), ECOREADY (Horizon EU), UMORPHEAS (EGPCR), Phenotypos (RIF), TraCEREAL (RIF), AENAON (Interreg), and MedSEVa (ERASMUS+).

Selected publications:

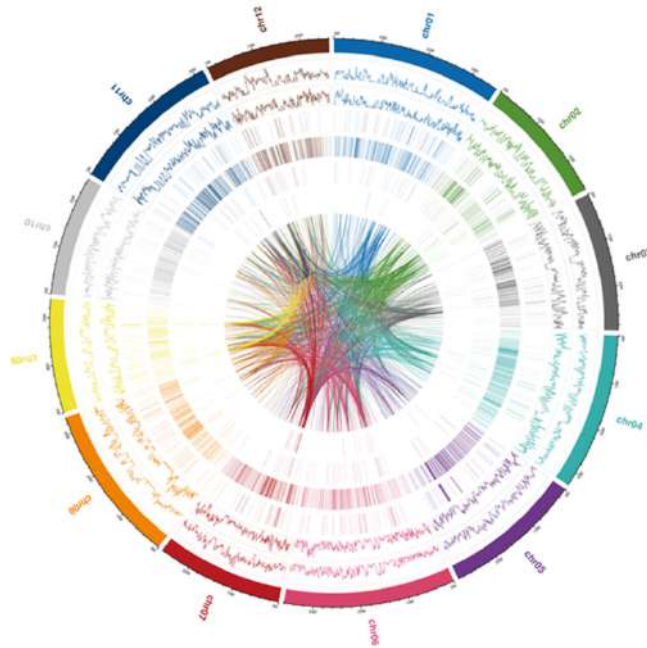
Platis, D.P.; Papoui, E.; Bantis, F.; Katsiotis, A.; Koukounaras, A.; Mamolos, A.P.; Mattas, K. 2023. Underutilized Vegetable Crops in the Mediterranean Region: A Literature Review of Their Requirements and the Ecosystem Services Provided. *Sustainability*, 15, 4921. <https://doi.org/10.3390/su15064921>

Gkatzamani, A.; Ipsilantis, I.; Menexes, G.; Katsiotis, A.; Mattas, K.; Koukounaras, A. 2024. The Impact of Salinity in the Irrigation of a Wild Underutilized Leafy Vegetable, *Sonchus oleraceus* L. *Plants*, 13, 1552. <https://doi.org/10.3390/plants13111552>

Eric N. Jellen, Charlene P. Wight, Manuel Spannag, Victoria C. Blake, James Chong, Matthias H. Herrmann, Catherine J. Howarth, Yung-Fen Huang, Jia Juqing, Andreas Katsiotis, Tim Langdon, Chengdao Li, Robert Park, Nicholas A. Tinker and Taner Z. Sen. 2024. A uniform gene and chromosome nomenclature system for oat (*Avena* spp.). *Crop & Pasture Science* 75, CP23247. doi:10.1071/CP23247



Greenhouse eggplant cultivation for the evaluation of morphological and biochemical traits (left). Eggplant fruit diversity across landraces (right).



Circos plot across the 12 chromosomes of a Cypriot *Cucumis melo* var. *flexuosus* landrace depicting significant SNP diversity and genomic reorganization compared to the reference type



Experimental plot for the evaluation of phenotypic variation of oat varieties using the Zadoks scale.



Research Group on Agricultural Microbiology and Biotechnology

Head: Dimitris Tsaltas, Professor

Team: Dr Michalakis Christoforou Special Teaching Staff, Dr Eleni Stylianou Postdoctoral Researcher, Dr Nicolas Kyllilis Postdoctoral Researcher, Dr Mamantia Constantinou Postdoctoral Researcher, Eleni Xenofontos PhD Student, Research Assistant and Project Manager, Faiza Ramzan PhD Student and Research Assistant, Antria Tsalakou PhD Student, Research Assistant and Project Manager, Iasonas Fotiou PhD Student and Research Assistant

Webpage: <https://www.facebook.com/MicrobeAtCUT>

Microbes from the Farm to the Fork

Globalization of the food supply has increased the range of plant, animal and foodborne pathogens as well as amplified health and economic impacts of a single contamination incident. At the same time quality foods require the thorough analysis of the biological substrate and/or the living organisms participating and interacting with it, in order to optimise production and prevent counterfeiting.

Production, processing, and distribution of food, increasingly takes place across vast and complex global networks—where each link in the chain needs to work optimally and stay free of contaminants that could taint the final product. Microorganisms are involved in food production in direct and indirect ways, by helping produce or transform food into specialized products with unique properties—adding flavour, improving nutrition or extending shelf life. Fermentations are responsible for a whole new list of products at all levels of agriculture and food production. From the farm to the fork, microbes orchestrate the transformation of biological matrices for the benefit of the environment, the plants, the animals and the humans. All fermentations are currently under deep exploration. From the soil and the rhizosphere, to cheese, wine and the animal or human gut we need to unravel and understand the real role of microbes. Their role to Global Health.

The “Farm to fork” approach emphasizes the importance of tracing food and feed from its very beginning steps of production in the field to the farm, the greenhouse, the sea or even the bioreactor, through to the point they reach our plates. On the other hand, the “One Health” concept came to highlight the interconnectedness of human, animal, and environmental health, stressing that the well-being of each directly affects the others.

Through a strong belief in “One Health” and “Farm to Fork” the Group of Agricultural Microbiology and Biotechnology at CUT is engaging in research all along the “Farm to fork” chain or otherwise from soil to plants, animals and humans as well as the environment that hosts these tremendously complicated living organisms. Microbiology research across the food supply chain combined with modern molecular biology techniques to study the microbial ecology and the interactions of microbes, their host and food matrices, offers valuable opportunities for university training, academic research, industrial collaboration and innovation.

Our Group is divided in three interacting divisions: Plant & Soil Microbiology, Food Safety and Food Fermentations and Animal Microbiology:

Plant & Soil Microbiology

This section's research focuses on the role of microbial biodiversity in soil and plant health and develops methodologies for soil health assessment as well as microbial inocula and microbial products enhancing health of agricultural ecosystems. Currently, agroecology is a main driving force of change for healthy soils and the Group is heavily engaged in multiple EU funded projects. The Group also works on Wastewater treatment for irrigation attempting to provide clear, knowledge-based guidance on its safe and effective use in agriculture and landscaping.

Food Safety and Food Fermentations

This section's research focuses on the role of microbes on produce and food fermentations. The Group's moto is that microbes create the ID and the quality of foods and thus accurate microbial fingerprinting is used to document and validate food authenticity. Our group works towards understanding and supporting quality and safety of traditional fermented products of Cyprus. Characterizing their microbiota evolution, we are contributing to the full profiling of the products and the development of starter cultures and probiotic inocula.

Animal Microbiology

This section's research focuses on the animal health and currently works for honeybee gut microbiome in relation to honeybee health. Equally important is the development of methodologies for Antimicrobial and Antiparasitic Resistance surveillance.

The Group uses modern tools of molecular ecology and biotechnology such as Next Generation Sequencing offering new perspectives in microbial characterization. Contribution to scientific research and knowledge is summed up by the development of a culture collection from all the ongoing projects, fully supporting the European motto for "Knowledge Based Bio-Economy". Our culture collection will be our documented "knowledge trust" for the future, creating bio-based opportunities for the Group as well as for the society.

A snapshot of current work

1. Composting and compost plant beneficial microbes along biochar interactions
2. Isolation and characterization of autochthonous microflora of Trahana (Fig. 1), Commandaria sweet wine, Pitsilia Cured Meats (Fig. 2), Table Olives (Fig. 3) and Arkatena (Fig. 4) for the development of artisanal starter cultures
3. Microbiome/metabarcoding and metagenomic analysis of various microbial ecosystems of food and agricultural importance (soil, plant roots, industrial fermentations) (Fig. 5)
4. Development of microbial terroirs as an authentication and geographical origin fingerprint tool in various fermented products
5. Bee gut microbiology
6. Development of molecular techniques for detection and enumeration of *Brettanomyces* spp in wine.
7. Potato cyst nematodes detection methods and potato cultivars resistance evaluation
8. Innovative protocols for reduction of pesticides use via DSS, resistance inducers, biostimulants and biocontrol agents

Funding and collaborations

Dr. Tsaltas is an American Society of Microbiology Ambassador and ASM International mentor. He is national representative of the International Food Association and leading the international efforts of the Association on research for Traditional Foods. He is also national representative of the Global Harmonization Initiative. The group has extensive collaborations with researchers in Europe, Israel, China,

South Africa and USA. Funding is secured from EU (H2020, Horizon Europe, ERASMUS+, LIFE+), Regional (INTERREG) and National funds (RPF, Ministry of Agriculture). The group is also securing funds from local industries through scholarships and offered services.

Selected publications

E. Kamilari, C. Stanton, D. Tsaltas, R.P. Ross (2024). Regional microbial content of fermented traditional and industrial East Mediterranean sausages from the islands of Cyprus and Mytilini. *Microbiome Research Reports* 4 (1)

E. Kamilari, D.A. Anagnostopoulos, D. Tsaltas (2023). Fermented table olives from Cyprus: Microbiota profile of three varieties from different regions through metabarcoding sequencing. *Frontiers in Microbiology* 13, 1101515

E. Kamilari, D. Tsaltas, C Stanton, RP. Ross (2022). Metataxonomic mapping of the microbial diversity of Irish and eastern Mediterranean cheeses. *Foods* 11 (16), 2483

A. Anagnostopoulos, D. Tsaltas (2022). Current Status, Recent Advances, and Main Challenges on Table Olive Fermentation: The Present Meets the Future, *Frontiers in Microbiology*, 2022

E Kamilari, M Mina, C Karallis, D Tsaltas (2021). Metataxonomic Analysis of Grape Microbiota During Wine Fermentation Reveals the Distinction of Cyprus Regional terroirs, *Frontiers in microbiology*, 2021

DA Anagnostopoulos, E Kamilari, D Tsaltas (2020). Evolution of bacterial communities, physicochemical changes and sensorial attributes of natural whole and cracked picual table olives during spontaneous and inoculated fermentation. *Frontiers in microbiology* 11, 1128

A Hadjilouka, K Loizou, T Apostolou, L Dougiakis, A Inglezakis, D Tsaltas (2020). Newly Developed System for the Robust Detection of *Listeria monocytogenes* Based on a Bioelectric Cell Biosensor. *Biosensors* 10 (11), 178

M. Mina and D. Tsaltas (2017). Contribution of yeast in wine aroma and flavor. *Yeast - Industrial Applications*, ISBN 978-953-51-5782-3, Book edited by: Prof. Antonio Morata, PhD Iris Loira Calvar; <https://www.intechopen.com/books/yeast-industrial-applications/contribution-of-yeast-in-wine-aromaand-flavour>



Research Group on Animal Genetics

Head: Despoina Miltiadou, Associate Professor

Team: Dr. Simoni Symeou, Mikaella Kyriakou (PhD Student), Eleni Sfakianaki (PhD student)

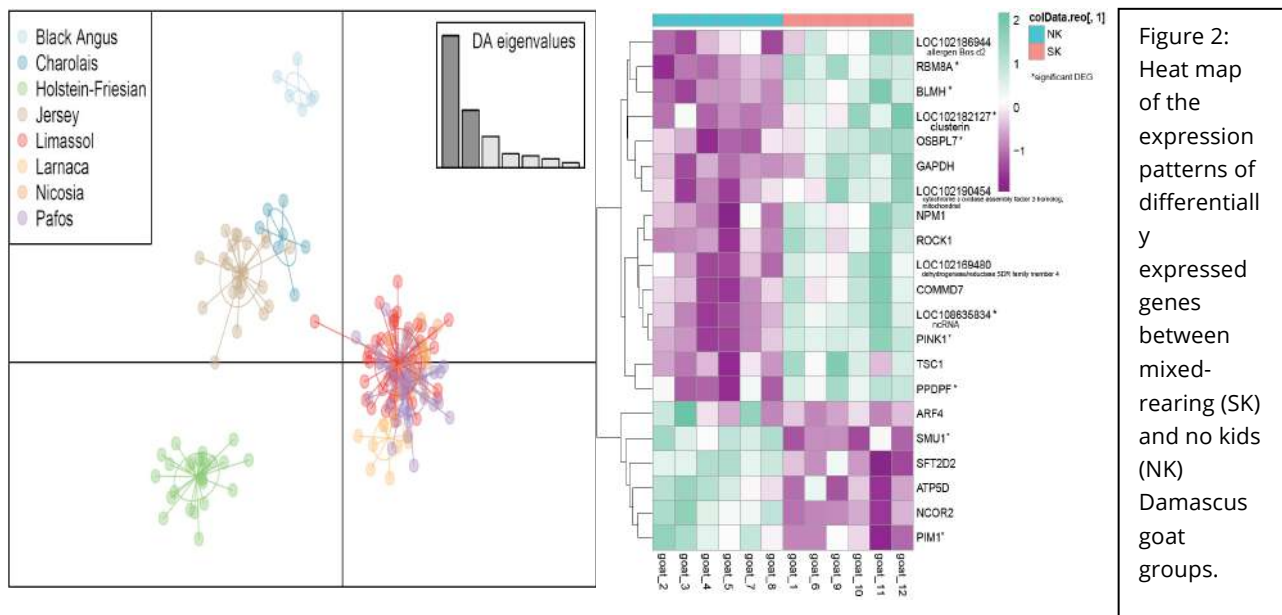
Webpage: <http://ktisis.cut.ac.cy/cris/rp/rp00047>

The preservation of animal genetic resources in Cyprus is crucial due to the unique ecological and geographical characteristics of the island that promotes unique adaptations due to isolation, leading to endemic species of animals and autochthonous breeds that are not found anywhere else in the world. In particular, native ruminant breeds well adapted to the extreme climate conditions of Cyprus is of paramount importance, as the loss of genetic variability is irreversible with consequences in farming, land use and soil regeneration, and the extinction of genes resistant to diseases or to adverse environments. Additionally, ruminant production is currently the most important priority of the Ministry of Agriculture and the dairy industry of Cyprus, due to the amount of milk required to support the main agricultural export of the country, the halloumi cheese, a protected designation of origin product. In parallel, ruminant production in Cyprus faces the challenge of a cost of feeding at least three times higher to EU average. Our group focuses on investigation of the genetic profile of native species and breeds, identification of genes associated with milk production and quality traits and investigation of management practices interplay.

The Cyprus Bovine Breed, an indigenous cattle population, faces ongoing challenges in preserving its genetic diversity due to the introduction of high yielding commercial breeds. Our study investigated the genetic structure of the breed and compared it to both commercial breeds grown in the island and global cattle populations. By analyzing nearly 10% of the total population using 18 microsatellite markers we found that the Cyprus Bovine Breed is clearly distinct from all imported commercial breeds grown in Cyprus and shows genetic affinities to both Zebu and African *Bos taurus* cattle (Figure 1), reflecting a complex history of genetic exchanges likely driven by ancient trade and migration routes. Although our findings reveal moderate to high genetic diversity of the indigenous Cyprus cattle breed, the effective population number is low and therefore to ensure the breed's survival, sustainable breeding practices and region-specific programs are essential to maintain its genetic integrity. Enhancing the preservation funding and exchanging males between the prefectures of Cyprus seems vital for the survival of the breed.

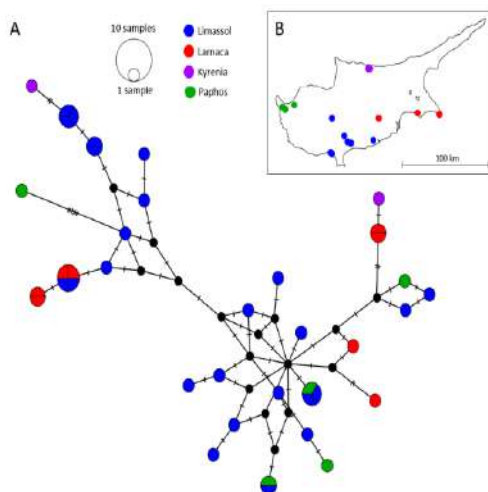
Another study investigated the effect of partial natural suckling on milk production, milk composition and the transcriptome of the mammary epithelium in Damascus goats, the main local goat breed farmed in Cyprus, since artificial suckling is often practiced in goats to increase commercial milk yield. Thirty goats in their second lactation period were divided into two equal groups: no breastfeeding (NK) and mixed rearing (SK). All goats were mechanically milked twice daily. In the NK group, kids were separated from their mothers immediately after birth, whereas in the SK group, the goats breastfed their kids until weaning. The results showed that partial breastfeeding in Damascus goats does not adversely affect commercial milk yield and quality, improves the fatty acid profile of the suckling goats and identified genes associated with breastfeeding. In particular, our transcriptomics analysis suggests that genes involved in developmental processes, RNA metabolism, nutrient transport and wound healing are differentially regulated in response to kid suckling (Figure 2). As mixed rearing has considerable advantages for

management and animal welfare, our study supports that the implementation of this practice does not negatively affect total income.



In another study, the genetic structure and diversity of *Mus cyriacus*, one of three small palaeoendemic mammals that have survived the Mediterranean islands' anthropization, was investigated using mitochondrial and microsatellite markers. This endemic to Cyprus species was described in 2006 and stands out as one of the last mammal species to have been discovered in Europe. Our analysis did not identify any population genetic structure and suggested a high genetic diversity across Cyprus. When inferring habitat preference using sample locations, it appeared that *M. cyriacus* utilizes a diverse variety of habitats, covering more than 80% of the island.

Fig. 3 A D-loop haplotype network calculated using median-joining. The circle size represents the frequency of the respective haplotype, and the colours represent the populations of the individuals carrying a given haplotype. The hatch marks on the edge represent mutations between haplotypes and black circles represent hypothetical haplotypes. B Map of Cyprus with the geographical location of *M. cyriacus* samples, with the same colour code as in (A)



Selected publications

The effect of breastfeeding on milk production, milk quality and the transcriptome of the mammary epithelium of Damascus goats. Submitted to Journal of Dairy Science

Genetic characterization of the indigenous Cyprus cattle breed. Submitted to Tropical Animal Health and Production

Population genetics and demography of the endemic mouse species of Cyprus, *Mus cyriacus*. Mammalian Biology (2024) 104:311–322



Research Group on Plant Stress Physiology

Head: Vasileios Fotopoulos, Professor

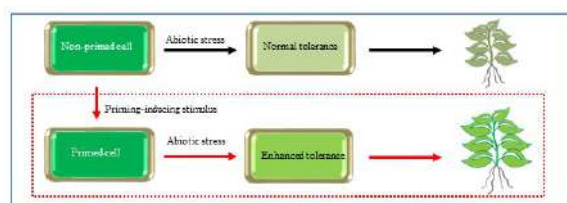
Team: Dr. Egli Georgiadou, Dr. Xavier Zarza, Andreas Ioannou, Alexandros Spanos, Ioanna Efstathiou

The increased frequency and extent of global climatic changes and associated extreme environmental events remarkably influence plant growth and development, ultimately affecting crop productivity throughout the world. Our research group has extensive research experience in plant stress physiology, biochemistry, molecular biology and biotechnology with emphasis on the study of oxidative and nitrosative signalling cascades involved in the plant's response to abiotic and biotic stress factors. Its staff and collaborators are comprised of plant physiologists, biochemists, molecular biologists and analytical chemists. Through our work we try to decipher the cellular mechanisms that orchestrate plant responses to such stress factors, while at the same time evaluating means of their amelioration. This is primarily done with chemical priming, which involves exposure to a priming agent such as a natural or synthetic chemical compound. Chemical priming presents opportunities for more effective use of plant priming in plant stress physiology studies and crop stress management. Furthermore, we are examining the potential improvement of priming agent efficiency through the smart delivery with engineered nanocarriers, using either nanoparticles or functionalized biopolymers, towards improved growth under normal conditions.

We participate in numerous national (Phenotypos, PlantNGreen) and EU-funded (Radiant, Primesoft, Primer) research projects and are members of international associations and networks such as the International Plant Proteomics Organization, as well as COST Actions CA22144 and CA22157. Our group also has extensive experience in hosting

international exchange students through Erasmus+ and COST STSM programs, including students from Poland, Greece, Austria, Italy and Spain.

Our network of collaborators extends globally, including partners at VIB in Belgium, Max Planck Institute in Germany, Zhejiang University in China, City University of New York in the US and CNR in Italy. In addition, we have experience in the establishment of intellectual property rights resulting from research carried out in our labs, leading to international patent WO 2015123273.A1. Attempts are currently being made to license the patented technology through a short-tech research project co-funded by the inventors' affiliating Institutes (CUT and CUNY; 'NOSH'-TEC).



Pretreatment using a priming-inducing stimulus (e.g., chemical compound) results in enhanced cell tolerance and amelioration of stress-induced plant growth inhibition.



Alfalfa plants (A) under drought stress, (B) well-watered, (C) pre-treated with melatonin and drought-stressed, (D) pre-treated with melatonin and watered.

Selected Publications (2024 – 2025)

- Sun L, Yin J, Wang L, Li J, Hu C, Liu B, Zheng C, Chen J, Fotopoulos V, Shu Q, Jiang M (2025). Role of serotonin in plant stress responses: Quo vadis? *Journal of Integrative Plant Biology* (in press)
- Fejes G, Bodor T, Szollosi R, Kondak S, Kutasi K, Fotopoulos V, Kolbert Z (2025). Nitric oxide as integral element in priming-induced tolerance and plant stress memory. *Journal of Experimental Botany* (in press)
- Giovannini L, Pagliarani C, Cañizares E, Sillo F, Chitarra W, De Rose S, Zampieri E, Ioannou AG, Spanos AL, Vita F, González-Guzmán M, Fotopoulos V, Arbona V, Balestrini R (2025). Mycorrhization and chemical seed priming boost tomato stress tolerance by shifts of primary and defence metabolic pathways. *Journal of Experimental Botany* (in press)
- Yu Y, Fotopoulos V, Zhou K, Fernie AR (2025). Role of gasotransmitter hydrogen sulfide in plant cadmium stress responses. *Trends in Plant Science* 30, 35-53
- Gohari G, Kulak M, Georgiadou EC, Ioannou A, Panahirad S, Mahmoudi R, Spanos A, Kocak MZ, Ntatsi G, Fotopoulos V (2024). Enhancing salinity stress tolerance in corn salad (*Valerianella locusta* L.) through melatonin or salicylic acid-functionalized chitosan seed priming: A smart delivery approach. *Plant Stress* 14, 100600
- Jiang M, Zhang H, Song Y, Chen J, Bai J, Tang J, Wang Q, Fotopoulos V, Zhu QH, Yang R, Li R (2024). Transcription factor OsbZIP10 modulates rice grain quality by regulating OsGIF1. *Plant Journal* 119, 2181-2198
- Guo M, Yang F, Zhu L, Wang L, Li Z, Qi Z, Fotopoulos V, Yu J, Zhou J (2024). Loss of cold tolerance is conferred by absence of the WRKY34 promoter fragment during tomato evolution. *Nature Communications* 15, 6667
- de Camargo Santos A, Schaffer B, Ioannou AG, Moon P, Shahid M, Rowland D, Tillman B, Bremgartner M, Fotopoulos V, Bassil E (2024). Melatonin seed priming improves early establishment and water stress tolerance of peanut. *Plant Physiology and Biochemistry* 211, 108664
- Gohari G, Jiang M, Manganaris GA, Zhou J, Fotopoulos V (2024). Next generation chemical priming: with a little help from our nanocarrier friends. *Trends in Plant Science* 29, 150-166



Research Group on Fruit Crops and Postharvest physiology and technology

Head: George Manganaris, Professor

Team: Egli Georgiadou (Research Associate), Elena Myrtsi (Research Associate), Sofia Torrado (Research Assistant), Nicolas Valanides (PhD student), Anna Maria Taliadorou (PhD student)

Webpage: www.fruitsciences.eu

Our group is having extensive research experience in issues related to preharvest and postharvest factors affecting fresh produce with special reference to fruit crops and grapes. We can routinely run an array of assays related to qualitative, physicochemical, phytochemical and biochemical properties of fresh produce. We have additionally focusing our research activities towards:

1. Optimization of production protocols/preharvest management practices
2. Control of physiological disorders both on- and off-vine
3. Characterization and valorization of indigenous cultivars, including the exploitation of underutilised fruit crops under Cypriot conditions
4. Incorporate innovative postharvest applications in the supply chain of fresh produce
5. Create a critical mass of interest and raise awareness among policy makers and end users for the deployment of the Group results at commercial scale
6. Identify market challenges and opportunities for the Cypriot horticultural sector with special reference to fruit crops and grapes

Funding sources (European Commission)

- Development of innovative priming technologies safeguarding yield security in soft fruit crops through a cutting-edge interdisciplinary approach, Call: HORIZON-WIDERA-2021-ACCESS-03-01 –Twinning, Budget: 894,000€, www.prime-soft.eu

- Sustainable optimization of the value chain of added-value fresh and dried berries through the integration of Precision Agriculture management strategies and innovative dehydration and edible coating processes, Call:H2020-MSCA-RISE-2020, CUT Budget: 193,200€ www.friets.eu



Editorships [Books]

Managanaris GA, Costa G, Crisosto CH. Peach, CABI publishers, 2023, pp. 424.



Outreach activities

- Organizer of ISHS Hort Forum episodes
- Elected Vice Chair of the Division: Temperate Fruit Crops [Period: 2022-2026]
- Co-convenor of IHC 2026 International Symposium on Physiology & Modelling for Sustainable Temperate Fruit Production

Keynote talks

- XIII ISHS International Rubus & Ribes Symposium Portland, United States, July 2023
- V ISHS Balkan Symposium on Fruit Growing, Zagreb, Croatia, June 2023
- Postharvest Conference in Belgrade, Serbia, January 2023
- V ISHS Symposium on Pomegranate and Minor Mediterranean Fruits, February 2022

Widening participation

CA21142: Water deficit and decision support systems applications (**FRUITCREWS**)

CA19125: Epigenetic mechanisms of crop adaptation to climate change (**EPICATCH**)

CA18210: Oxygen sensing a novel mean for biology and technology of fruit quality (**ROXYCOST**)

Selected publications

(available through the link: <https://www.fruitsciences.eu/research-papers.html>)

- Gohari G, Jiang M, Manganaris GA, Zhou J, Fotopoulos V. Next generation chemical priming: with a little help from our nanocarrier friends. Trends in Plant Science 2024, 29, 150-166.
- Varnava A, Stavrinides M, Manganaris GA. Assessing the biodiversity and the impact of pollinators on carob production. Plos One 2023, 18: e0291431
- Georgiadou EC, Mina M, Neoptolemu V, Koundouras S, D'onofrio C, Bellincontro A, Mencarelli F, Fotopoulos V, Manganaris GA. The beneficial effect of leaf removal during fruit set on physiological, biochemical, and qualitative indices and volatile organic compound profile of the Cypriot reference cultivar 'Xynisteri'. Journal of the Science of Food & Agriculture 2023, 103, 3776-3786.
- Manganaris GA, Minas I, Cirilli M, Torres R, Bassi D, Costa G. Peach for the future: a specialty crop revisited. Scientia Horticulturae 2022, 111390.
- Neri D, Crescenzi S, Massetani F, Manganaris GA, Giorgi V. Current trends and future perspectives towards sustainable and economically viable peach training systems. Scientia Horticulturae 2022, 111348.
- Christofi M, Pavlou A, Lantzouraki DZ, Tsiaka T, Myrtsi E, Zoumpoulakis P, Haroutounian SA, Mauromoustakos A, Biliaderis CG, Manganaris GA. Profiling phytochemicals in fresh and canned fruit of peach cultivars: impact of genotype and canning process on their concentration. Journal of Food Composition & Analysis 2022, 104734



Research Group on Sustainable Agriculture (**SAG**)

Head: Menelaos Stavrinides, Associate Professor

Team: Andri Varnava, Athanasia Mandoulaki, Chrysis Kaponas, Pamela Theophanous

Webpage: <http://sustagric.com/>

Research in the Sustainable Agriculture Group (SAG) focuses on improving the sustainability of crop protection and agricultural production in the face of a changing climate. Our work encompasses three main interlinked areas:

1) Agri-environmental Research

One of the key ecosystem services, pollination, is essential for maintaining the productivity of agricultural ecosystems. Andri Varnava, a PhD student in our group (co-supervised by Assoc. Professor D. Michez of the University of Mons, Belgium) published the first modern updated checklist of the wild bees of Cyprus. We found that Cyprus hosts 369 species of bees, of which 21 are endemic. In addition, through the COST ACTION SUPER-B, we participated in research showing that almost half of the surveyed farmers believed they had pollination service deficits for at least one of their crops. Furthermore, in another multi-collaborative work we evaluated the effectiveness of ecological focus areas for pollinator conservation and recommended that to improve habitat quality for pollinators an effective monitoring framework is needed.

The new Farm to Fork Strategy and the Post-2020 Common Agricultural Policy (CAP) place tremendous importance on the environment. Guided by our interests and the permeating sustainability environment, we coordinated the EU funded AgroLIFE project, the first effort in Cyprus to promote the conservation of High Nature Farmland (HNVF). HNVF represents agricultural fields and interwoven surrounding areas, which are of high importance for the conservation of biodiversity, and the preservation of traditional landscapes. Collaborating with Prof. Vogiatzakis of the Open University in Cyprus we characterised and mapped HNVF, showing that 35% of the area of the island is potentially HNVF. Key findings from AgroLIFE were used to design a new set of agri-environmental measures to provide support to farmers within the Cyprus Agricultural Development Programme. In a subsequent study we used HNVFs as an indicator for the provision of ecosystem services, and we are currently refining refine this work through our participation in a successful Integrated LIFE Project application (LIFE IP PHYSIS - <https://pandoteira.cy/>) coordinated by the Cyprus Department of Environment.

b) Sustainable pest management

Essential oils from various plant species exhibit promising effectiveness against pests. Working with Assist. Professor N. Tzortzakis at CUT, we showed that essential oil produced from lavender grown under water stress caused higher mortality to *T. urticae* than essential oil from plants grown under regular irrigation. Through collaboration with a Cypriot SME, we secured funding from the Research and Innovation Foundation of Cyprus (RIFCy) and evaluated the potential of an essential oil-based biopesticide against *T. urticae*, whiteflies (*Bemisia tabaci*) and aphids (*Myzus persicae*), and to test its effects to the predator *P. persimilis* – the PLANTSAFE project. We found that the product shows promising results in the lab, while appropriate formulation seems to be required for adequate effectiveness in the field.

c) The environmental footprint of agricultural products

In an effort to establish a single market for green products across the EU, the Union has been developing the concept of the Product Environmental Footprint (PEF). The idea behind the PEF is simple: Enable consumers to compare the environmental performance of products based on a comprehensive assessment of environmental impacts over the life-cycle. The PEF for wine includes four impact categories: Carbon emissions (the carbon footprint), water use, eutrophication potential (fertilizer use) and biodiversity impacts. Working independently but in parallel to the EU initiative, we determined for the first time the carbon footprint of grapes from native and introduced varieties in Cyprus, showing that the CF of grapes from native varieties is three times lower than that of introduced varieties. In a subsequent study we showed that 73% of the CF is due to winery practices. Along similar lines, we established for the first time the CF for important medicinal and aromatic plants grown in Cyprus. The work in vineyards was funded by the RIFCy funded project ECOWINERY, where we worked closely with the SME Nicolaides winery, the National and Technical University of Athens, the University of Aberdeen and a global player, the NGO Cool Farm Alliance to estimate for the first time the PEF for Cypriot wine and develop a methodology for determining the biodiversity impact score. Athanasia Mandoulaki, a PhD student in my group focuses her research on evaluating the biodiversity effects of viticultural management practices and developing a scoring system for quantifying their impact.

1.31 kg CO₂ per bottle

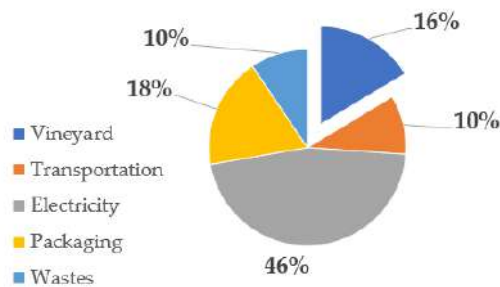


Fig. 1. Wild bee of Genus *Melecta* sp. (left) and collecting bees with the net (right).



Fig. 2. The carbon footprint for a Cypriot wine.



Fig. 3. Lowering pesticide use in vineyards through modern spraying technologies

Selected publications

Pe'er, G., Finn, J. A., Díaz, M., Birkenstock, M., Lakner, S., Röder, N., ... , Stavrínides, M., Targetti, S., Viaggi, D., Vogiatzakis, I. N., & Guyomard, H. (2022). How can the European Common Agricultural Policy help halt biodiversity loss? Recommendations by over 300 experts. *Conservation Letters*, 00, e12901. <https://doi.org/10.1111/conl.12901>

Ioannidou, S. C., Litskas, V. D., Stavrínides, M. C., & Vogiatzakis, I. N. (2022). Linking management practices and soil properties to Ecosystem Services in Mediterranean mixed orchards. *Ecosystem Services*, 53, 101378. <https://doi.org/10.1016/j.ECOSER.2021.101378>

Michael, C., Gil, E., Gallart, M., & Stavrínides, M. C. (2020). Influence of spray technology and application rate on leaf deposit and ground losses in mountain viticulture. *Agriculture (Switzerland)*, 10(12), 1–18. <https://doi.org/10.3390/agriculture10120615>

Varnava, A., Roberts, S.P.M, Michez, D., Ascher, J., Petanidou, T., Dimitriou, S., Devalez, J., Pittara, M., Stavrínides, M.C. The wild bees (Hymenoptera: Apoidea) of the island of Cyprus. *ZooKeys*. Accepted November 2019.

More publications available at: <http://sustagric.weebly.com/publications.html>



Research Group on Dairy Science and Technology

Head: Photis Papademas, Associate Professor

Team: Ioanna Neokleous (PhD Student and Research Assistant), Kallis Souroullas (PhD Student), Lina Kotsaki (PhD Student), Panayiotis Mousikos (PhD Student)

Webpage: <https://ppapademas.wixsite.com/dstech>

Dairy Products hold a major share of the worldwide food production as the dairy industry is considered a massive business. Research on Dairy Science and Technology is essential in producing high-quality, safe, nutritious products. As we are situated in the Eastern part of the Mediterranean we have the opportunity to work with milk types other than cow. Therefore, our group has extensive research experience in non-cow milks such as goat, sheep and donkey milk.

Over the last years the study of donkey milk is a major research objective of our group, where the potential positive health impact of donkey milk (i.e. immunity related disorders) is studied through an international multi-disciplinary approach. We have also extensively studied the microbiome of donkey milk and used some of the isolated lactic acid bacteria to produce fermented products with functional properties.

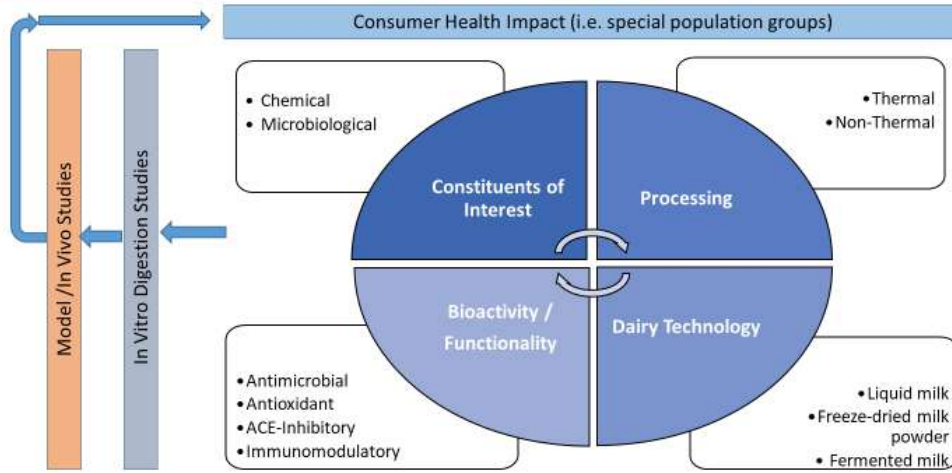
We are very much interested in characterising and “adding-value” through research to traditional dairy products and we have worked significantly over the years (and still are through funding by the Ministry of Agriculture Rural Development and Environment) on sheep/goat Halloumi cheese (i.e. authentication, feeding regimes/areas of production, characterisation of the product). Additionally, we studied/characterised of a lesser-known Cyprus white-brined cheese named Halitzia which has recently gained a PGI status.

The more recent projects we are involved focus in (a) the valorization of whey as a by-product of cheese making to produce probiotic drinks (b) the production of a probiotic donkey milk drink, (c) the use of UV-C technology to process bovine milk to extend its shelf life and (d) develop a Novel Verification Method of UV-C Treatment of Milk.

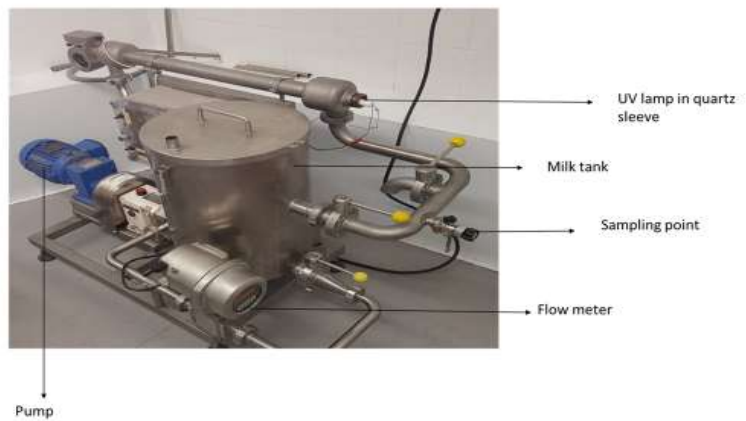
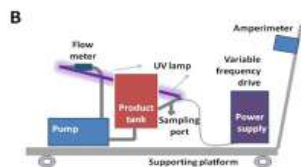
Moreover, our group in collaboration with the Research Group on Food Microbiology and Bioactivities and Dr Maria Aspri has successfully completed two research projects: a) “Deliver” funded by the Research and Innovation Foundation of Cyprus. We partnered with a local enterprise to produce a novel, bioactive donkey milk powder by a non-thermal processing method (UV-C) that has a minimal impact on the product’s bioactivity, and b) “MILI” funded by the Research and Innovation Foundation of Cyprus. The main objective of the project is to design and develop a novel method and related prototype to simultaneously detect in less than 10 minutes a selected panel of common milk contaminants (Aflatoxin-M1 and Antibiotics) at farm level.

We are also part of the COST Action PIMENTO Promoting Innovation of ferMENTed fOods as WG2 Co-leader. The long-term goal of PIMENTO is to place Europe at the spearhead of innovation on microbial foods, promoting health, regional diversity, local production at different scales.

Donkey Milk Research



UV-C Photo-purification System Deliver



Our network of collaborators includes academic partners from Parma University and Molise University in Italy, University College Dublin in Ireland, Queen's University Belfast in the UK, the Agricultural University of Athens, Aristotle University Thessaloniki, in Greece and others.

Additionally, we have participated/organised numerous outreach activities such as public talks, science fairs and others, in an attempt to promote Dairy Science and Technology research and education in Cyprus. Our group has extensive experience in hosting international conferences such as the IDF 7th IDF International Symposium on Sheep, Goat and another non-Cow Milk which was hosted in Limassol, Cyprus in 2015.

Publications

For a full list of publications please visit:

Orcid ID: <https://orcid.org/0000-0003-0284-2247>

Google Scholar: <https://scholar.google.com/citations?user=ATM5l0oAAAAJ&hl=en>

Selected Publications

Souroullas, K., Manoli, A., Itskos, G., Apostolou, T., & Papademas, P. (2024). Fluorescence of Intrinsic Milk Chromophores as a Novel Verification Method of UV-C Treatment of Milk. *Foods*, 13(18), 2887.

Tedeschi, T., Loffi, C., Dellafiora, L., Galaverna, G., Aspri, M., & Papademas, P. (2023). Processing of raw donkey milk by pasteurisation and UV-C to produce freeze-dried milk powders: the effect on protein quality, digestibility and bioactive properties.

Papademas, P., Aspri, M., Malissiova, E., Fantuz, F., Salimei, E. (2022) Donkey Milk. In: McSweeney, P.L.H., McNamara, J.P. (Eds.), *Encyclopedia of Dairy Sciences*, vol. 5. Elsevier, Academic Press, pp. 522–529.

Papademas, P., Bintsis, T. (2022) Cheese from Non-Bovine Milk. In: McSweeney, P.L.H., McNamara, J.P. (Eds.), *Encyclopedia of Dairy Sciences*, vol. 3. Elsevier, Academic Press, pp. 91–100.



Research Group on Hydro-Aromatic Plants

Head: Nikolaos Tzortzakis, Associate Professor

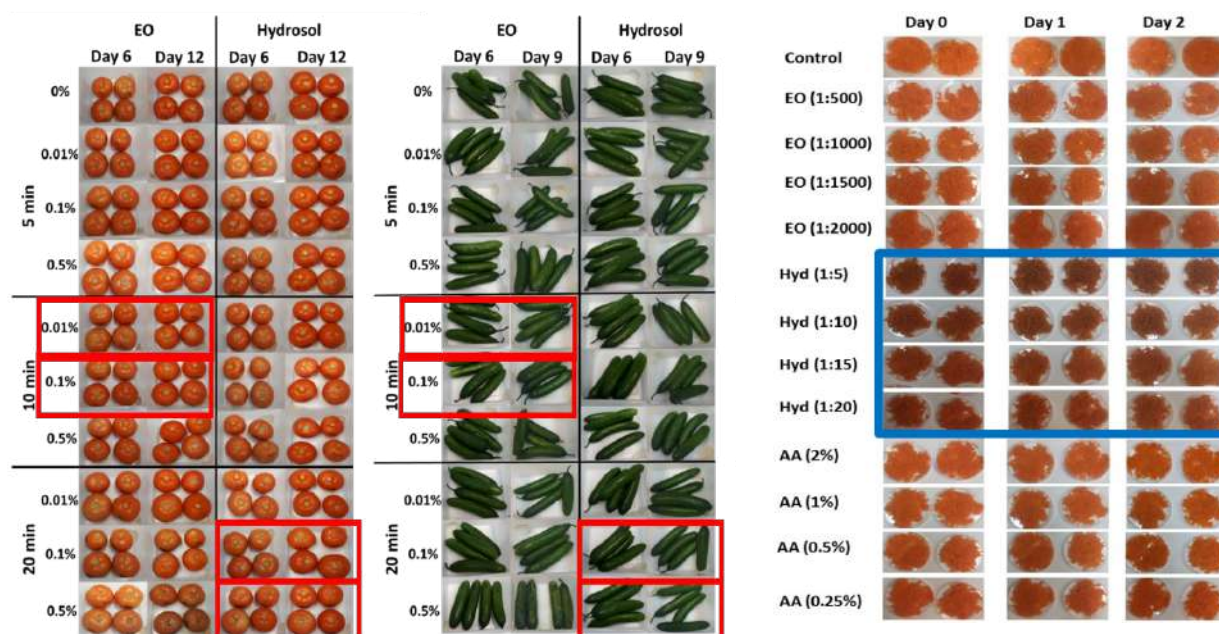
Team: Dr Antonios Chrysargyris*, Dr Panayiota Xylia, Dr Munoo Prasad, Dr Kalia Kyriakou, Giannis Neofytou, Antria Kotsoni, Constantinos Stefanou, Christos Goumenos, Stavros Louka, Efraimia Hajisolomou, Michalis Makrygiorgis, Afroditi Pachniotou, Nikoletta Zaravelli, Lilav Hussein, Stefanos Christou, Marialena Oikonomou

(*Since 2025, Dr A. Chrysargyris, is Special Teaching Staff at CUT)

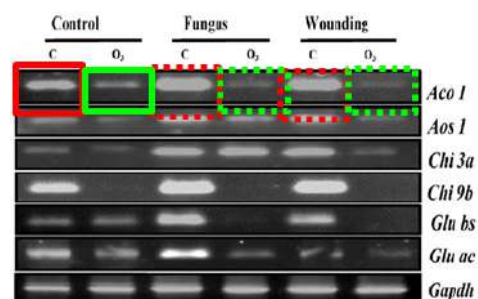
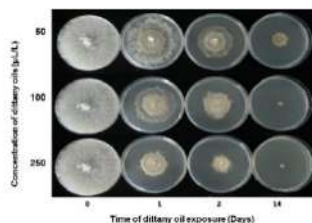
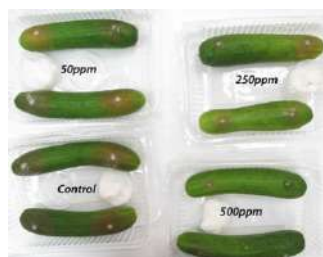
Webpage: <http://www.cut.ac.cy/hydro-aromatic-plants>

Plant nutrition and food safety are major concerns nowadays, attracting significant research interest from scientists. Meanwhile, crops' adaptation to various abiotic and biotic factors has become increasingly evident due to climate change. Our group has extensive research experience in plant nutrition and plant physiology/ biochemistry, focusing on both soil and hydroponic cultivation of vegetables and aromatic/medicinal plants. Additionally, we have more than 24 years of experience in Postharvest Science, specializing in fresh produce preservation using natural sanitizers, essential oils and ozone, evaluating antimicrobial properties through pathogenic, physiological and biochemical/molecular approaches. Our team (staff and collaborators) consists of plant physiologists, biologists, food scientists, biochemists and analytical chemists.

Given the growing interest in natural-based products and eco-friendly preservation techniques, as well as increasing consumer acceptance, we have explored the use of natural products, essential oils and hydrosols as potential sanitizers against postharvest diseases. These approaches not only contribute to disease control but also enhance quality and storability of fresh produce.



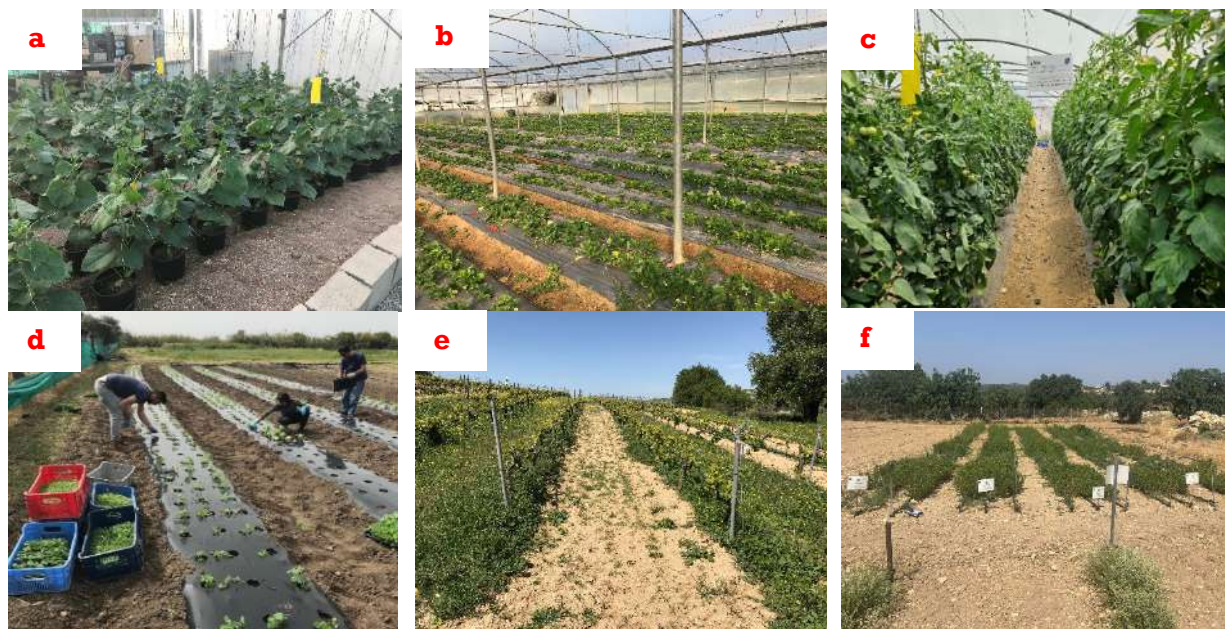
Optimization of essential oils, hydrosol and natural products applications on tomatoes, cucumbers and shredded carrots.



(a) Antifungal activity of essential oils in tomato fruit

(b) Ozone-induced resistance

Our research also examines various cultivation practices, including tillage, semi tillage and no tillage methods, organic vs. conventional farming, the use of biostimulants, and the management and application of agricultural leftovers. Additionally, we study plant responses to abiotic stresses, as drought, heat, salinity, and mineral imbalances, under both field and greenhouse conditions across various crops.



a) Cucumber with biostimulants, (b) Strawberry sprayed with ecofriendly product, (c) tomato with biofertilizers, (d) Medicinal/Aromatic plants under drought stress and organic farming, (e) Grapevines with tillage-semi tillage-no tillage applications and drought stress (f) Purslane and Sonchus under different fertilization schemes.

Through our research, we strive to optimize crop nutrition by developing tailor-made nutrient recipes that meet plant specific needs. Additionally, we focus on enhancing induced resistance, particularly to abiotic stresses. To support this work, we have designed and constructed a fully automated greenhouse,

where we study crops under various hydroponic systems, including both horizontal and vertical setups.



(a) Spearmint in DFT, (b) Lettuce in Zig-Zag, (c) Lettuce in pumice and sawdust, (d) Tomato in perlite, (e) Lettuce in NFT.

We actively participate and coordinate numerous national and EU-funded research projects including AGROLABS, VITISMART, MIDIVINE, STOPMEDWASTE, VALUEFARM, OPTIAROMAO, LIFE EBP, CYANOTECH, SUSTAPONICS, BASICS, NUTRISENCE PLANTS SAFE projects. Our collaborative network extends globally, including partnerships across the EU, USA, S. Africa, Asia and Africa. We are also members of international associations and networks such as COST Actions FA1106, CA17133 and EUVRIN. Additionally, our team has extensive experience in training farmers and agronomists, offering short courses and summer schools. Members of our group serve on

scientific committees for international conferences, including the 2nd QMAP, WWPR2012, IWA Regional Workshop, WWMST2013, Postharvest Unlimited, SHE2016, and the 4th-12th Int. Conference on SSWM. We have also organized major scientific events as the III International Symposium on Soilless Culture and Hydroponics and the VI International Symposium on Postharvest Pathology in Cyprus. Furthermore, Tzortzakis N. has received high quality international recognition, ranking among the TOP 2% of researchers globally of his main subfield discipline, for 2019, 2020, 2021, 2022 and 2023, as published by Stanford University.

Selected Publications

Chrysargyris A, Xylia P, Tzortzakis N, 2024. Drying temperature and conditions affect the *Origanum dubium* Boiss. and *Salvia fruticosa* Mill. quality attributes and impact the essential oil composition, antimicrobial and antioxidant activities. *Industrial Crops and Products*, 222, 4, 119898.

Tzortzakis N, Chrysargyris A, 2024. Olive-mill and grape-mill residue impact the growth, physiology and nutrient status of grapevines young cuttings. *Sustainable Chemistry and Pharmacy*, 37, 101362.

Chrysargyris A, Tzortzakis N, 2023. Optimising fertigation of hydroponically grown sowthistle (*Sonchus oleraceus* L.): The impact of the nitrogen source and supply concentration. *Agricultural Water Management*, 289, 108528

Pires E.de O., Di Gioia F, Roupheal Y, García-Caparrós P, Tzortzakis N, Ferreira ICFR, Barros L, Petropoulos SA, Caleja C, 2023. Edible flowers as an emerging horticultural product: a review on sensorial properties, mineral and aroma profile. *Trends in Food Science & Technology*, 137, 31-54.

Rajestary R, Xylia P, Chrysargyris, A, Romanazzi G, Tzortzakis N, 2022. Preharvest Application of Commercial Products Based on Chitosan, Phosphoric Acid Plus Micronutrients, and Orange Essential Oil on Postharvest Quality and Gray Mold Infections of Strawberry. *International Journal of Molecular Sciences*, 23, 15472.

Xylia P, Fasko KG, Chrysargyris A, Tzortzakis N, 2022. Heat treatment, sodium carbonate, ascorbic acid and rosemary essential oil application for the preservation of fresh *Rosmarinus officinalis* quality. *Postharvest Biology and Technology*, 187, 111868.

Xylia P, Chrysargyris A, Botsaris G, Skandamis P, Tzortzakis N, 2022. *Salmonella* Enteritidis survival in different temperatures and nutrient solution pH levels in hydroponically grown lettuce. *Food Microbiology*, 102, 103898.

Research Group on Food Technology and Microbiology

Head: George Botsaris, Associate Professor

Team: Nikolas Markantonis, Christodoulos Michael, Maria Liapi, Dimitris Zinonos, Loizou Ioanna, Avgousti Filios, Ioakeim Androulla

The research of our group focuses in three interrelated areas within Food Technology / Biotechnology and Food Microbiology:

1. Application of bacteriophage in food and veterinary diagnostics and in the biological control of bacterial diseases
2. Detection and control of foodborne pathogens and other important microorganisms in the food supply chain
3. Development of novel functional foods and their shelf-life evaluation.

The detection of food borne pathogens via the application of a combine bacteriophage detection and molecular confirmation by PCR is a very promising tool in food and veterinary diagnostics. The philosophy of this method is based on the detection of the targeted species of bacteria with the use of bacteriophage and the molecular identification of the species by PCR. This method has the ability to identify viable cells in less than 24 hours. The methodology we use for detecting MAP is schematically presented in Figure 1.

The phage amplification assay is faster and more sensitive compared to the conventional culture and other immunological detection methods. These advantages are shared with molecular detection methods like the PCR and qPCR. The phage amplification assay though, has the vital advantage of being able to differentiate between live and dead cells. This advantage is of critical importance when analysing processed food samples.

Following the successful application and validation of our method in milk, dairy products and powder infant formulas, we are now investigating the possibility of applying strictly lytic bacteriophage in an attempt to biologically control paratuberculosis and other mycobacterial diseases.

Towards the effort to improve food borne pathogen detection and monitoring in the food chain in Cyprus, we have recently completed a study reporting the detection of *Mycoplasma bovis*, *Staphylococcus aureus* and *Streptococcus agalactiae* in cattle bulk tank milk and the relations with somatic cell counts. Other projects are also initiated aiming at recording the prevalence of other important foodborne bacterial pathogens and viruses.

More recently the rise of antimicrobial resistance alongside the shift in the consumers' demand for safer and healthier products directed our group's research towards the pivotal need of investigating natural products and their potential antimicrobial activity against foodborne pathogens. We are currently investigating the antimicrobial effect of pure phenols as carvacrol, eugenol, catechin, quercetin, gallic acid, and extracts namely carob leaves, pomegranate peels, *Capparis spinosa* leaves, *Geranium purpureum* leaves, *Glycyrrhiza glabra* leaves and roots vine and liquorice industry by-products as well as *Pistacia lentiscus* essential oil against different strains of *Listeria monocytogenes*, *Salmonella* Enteritidis, *Escherichia coli* and *Staphylococcus aureus*.

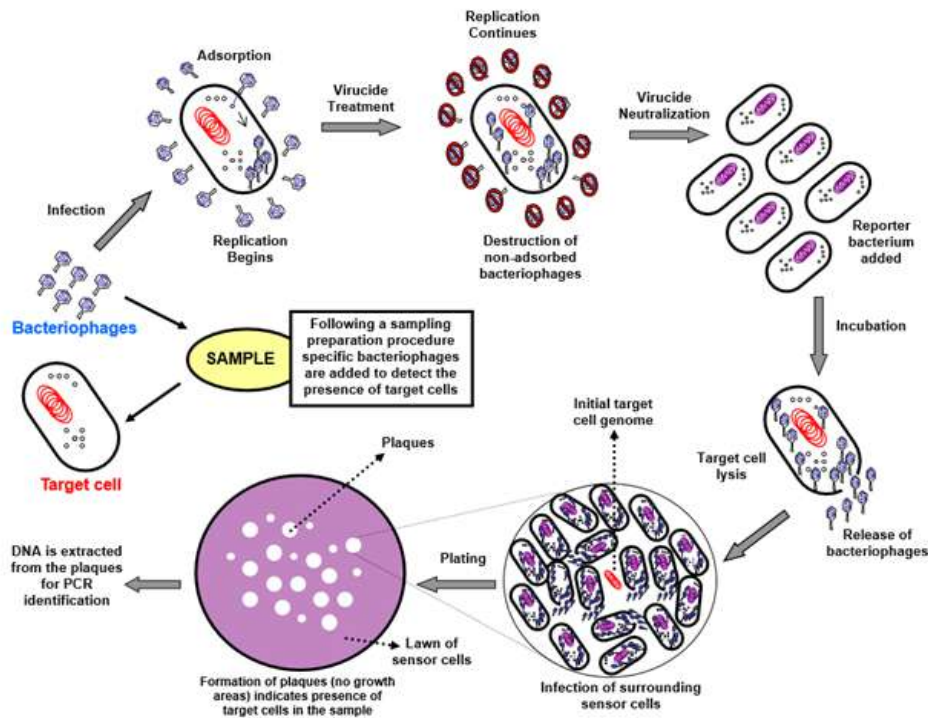


Figure 1. Diagram of phage amplification assay. Phage are added to sample and infects any target cells present in the sample. After time for infection, any remaining intact phage are destroyed using a virucide. This is neutralized by dilution and then new phage produced from the infected cell are detected by plating the sample in a lawn of phage-sensitive ‘sensor’ cells. To increase specificity, DNA can be extracted from plaques for PCR amplification of genomic signature sequences from the target cell.

Finally, the technological development and shelf-life evaluation of novel functional foods is gaining major interest, considering the shift towards healthier products in the developed countries and the resulting increase of the functional food market. Our research interests in the area, focus on the development of novel yoghurt-based products assessing the effects of functional ingredients on the viability of probiotic microorganisms and on the organoleptic quality.

Collaborating with the local industry in a number of small projects we have managed to produce results that merited publication in scientific journals, whilst offering also solutions to problems encountered. We will continue working in close association with government services and the local industry in an attempt to provide solutions to the industry and assist the authorities in their efforts to monitor and control the prevalence of foodborne pathogens throughout the food chain.

Selected publications

1. Liapi, M., Botsaris, G., Arsenoglou, C., Markantonis, N., Michael, C., Antoniou, A., Pipis, C., 2021. Rapid Detection of *Mycoplasma bovis*, *Staphylococcus aureus* and *Streptococcus agalactiae* in Cattle Bulk Tank Milk in Cyprus and Relations with Somatic Cell Counts. *Pathogens* 10, 841
2. Hadjimbei, E., Botsaris, G., Goulas, V., Alexandri, E., Gekas, V., & Gerothanassis, I. P. 2020.. Functional stability of goats' milk yoghurt supplemented with *Pistacia atlantica* resin extracts and *Saccharomyces boulardii* *International Journal of Dairy Technology* 73, 134-143
3. Xylia, P., Botsaris, G., Chrysargyris, A., Skandamis, P., Tzortzakis, N. 2019. Variation of microbial load and biochemical activity of ready-to-eat salads in Cyprus as affected by vegetable type, season, and producer *Food microbiology* 83, 200-210



Research Group on Phytopathology & Integrated Management of Plant Diseases

Head: Loukas Kanetis, Associate Professor

Team: Chrysostomos Oplos, Styliana Efstathiou, Georgios Makris

The research of our group focuses mainly on the following interrelated areas of Plant Pathology:

1. Etiology, epidemiology, and population dynamics of existing and emerging plant pathogenic microorganisms, focusing on grapevine and tree-fruit trunk diseases (GTDs).
2. Integrated plant disease management.
3. Development of eco-friendly management solutions, an alternative to synthetic pesticides.

Our current research has highlighted the significance of GTDs in Cyprus, a group of devastating plant diseases that severely affect the longevity and productivity of the local vineyards and worldwide. More specifically, we have documented **(a)** the etiology of the implicated fungal species, describing novel fungal species associated, such as *Seimatosporium cyprium*; **(b)** their pathogenicity, and **(c)** the development of integrated management schemes under Cyprus conditions, that implicates synthetic chemistries, biological control agents, cultural practices, and other alternative practices (thermotherapy of grapevine propagation material). Furthermore, we have already assessed the indigenous grapevine cultivars for their sensitivity to GTD-related pathogens, and we are advancing towards the development of novel biocontrol agents for the disease management of Esca and Botryosphaeria dieback.

Disentangling pathogen population structure in anthropogenic agroecosystems is crucial to designing more effective management schemes. We recently studied how evolutionary forces exerted in different farming systems, in terms of agrochemical inputs, shape *Botrytis cinerea* populations. Results highlighted widespread fungicide resistance in conventional farms, while a considerable frequency was also detected in organic cropping systems. Genotyping analyses were able to detect population structure associated with resistance to fungicides. However, genetic variance among strawberry and tomato populations of this significant pathogen was high, ranking host specificity higher than other selection forces studied.

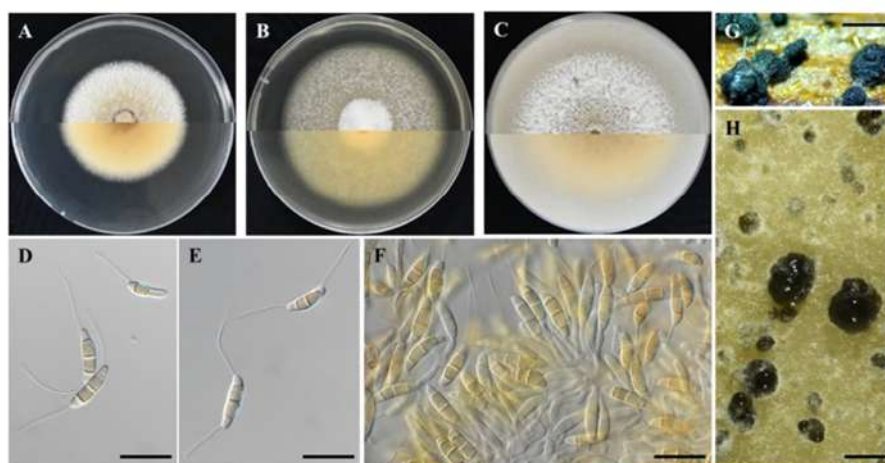
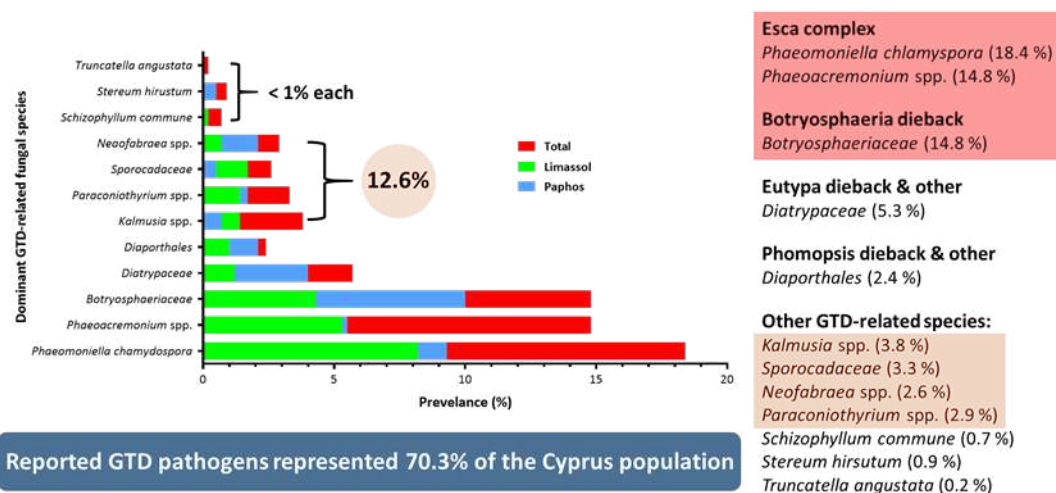
Our findings have been announced in international conferences by members of our group and published in peer-reviewed journals.

We participate in national (Rural Development Program 2014-2020, Ministry of Agriculture) and international research projects (PRIMA, Horizon 2020 Research and Innovation Program), COST Actions, and scientific organizations (APS, MPU, HPS). Our group also holds a collaborative network with other research labs in Cyprus, Greece, Italy, and the USA. Furthermore, we have been hosting international exchange students via Erasmus⁺ actions in our facilities. At the same time, we have established numerous synergies with national governmental services and the local industry to provide consultation and promote novel and sound solutions to plant disease management.

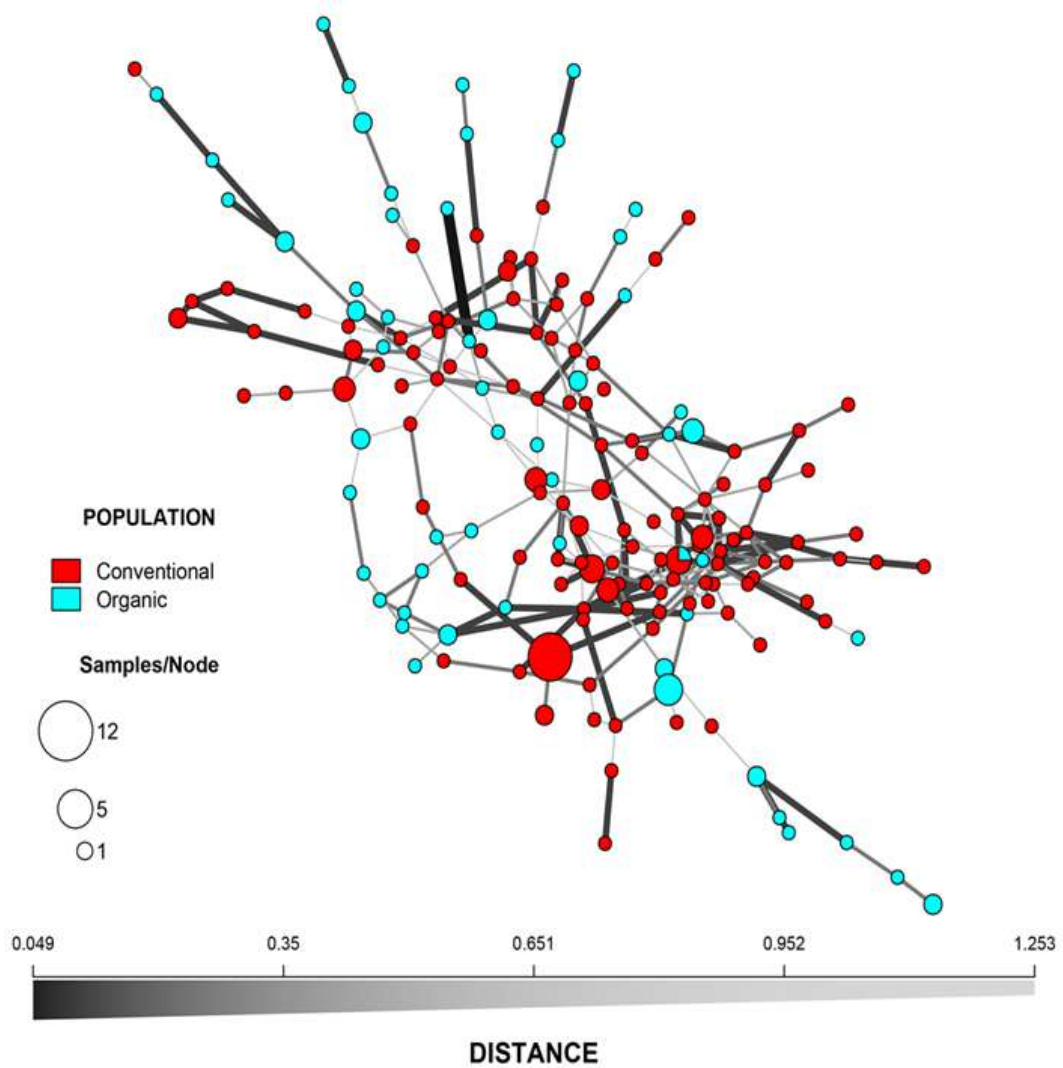
Selected publications

1. Makris G., Solonos S., Christodoulou M., Kanetis L.I. (2022) First report of *Diaporthe foeniculina* associated with grapevine trunk diseases on *Vitis vinifera* in Cyprus. *Plant Disease*, 106(4), 1294.
2. Makris G., Nikoloudakis N., Samaras A., Karaoglanidis G.S., Kanetis L.I. (2022) Under pressure: A comparative study of *Botrytis cinerea* populations from conventional and organic farms in Cyprus and Greece. *Phytopathology* 112 (10), 2236-2247.
3. Markakis E.A., Soutlatos S.K., Koubouris G.C., Psarras, G., Kanetis L., Papadaki A.A., Goumas D.E. (2022) First report of *Pseudophaeomoniella oleae* causing wood streaking and decay on olive trees in Greece. *Plant Disease* 106 (8), 2263.
4. Kanetis L.I., Taliadoros D., Makris G., Christoforou M. (2022) A novel *Seimatosporium* and other Sporocadaceae species associated with grapevine trunk diseases in Cyprus. *Plants*, 11, 2733.
5. Hadjichristodoulou M., Papoutsas C., Kanetis L., Stavrinides M., Eliades M., Hadjimitsis D. (2024) An insight into remote sensing solutions for monitoring the *Xylella fastidiosa* bacterium that is threatening olive trees: A literature review. *Proc. SPIE 13212, Tenth International Conference on Remote Sensing and Geoinformation of the Environment (RSCy2024)*, 1321210.

Prevalence of GTD-related fungi in Cyprus vineyards



Novel species *Seimatosporium cypricum*, isolate L111 (CBS 149019). (A-C) Colonies cultured on PDA, MEA, and OA, respectively, at 25°C in the dark for 14 days (top: above and bottom: reverse); (D,E) Septate conidia with long basal and apical appendages; (E,F) Conidiophores, conidiogenous cells, and conidia; (G) Superficial conidiomata on autoclaved grapevine wood segments; (H) Conidiomata on OA. Scale bars: 20 μm (D-F) and 500 μm (G,H).



Minimum Spanning Network of 219 *Botrytis cinerea* isolates from Cyprus & Greece. Populations for the analysis were assigned based on the farming system followed. The nodal size correlates with the number of isolates of the same MLG. Line thickness in the MSN represents Nei's distance (*denser line signifies a reduced genetic distance*).



Research Group on Food Chemistry and Analysis and Magnetic Resonance Spectroscopies

Head: Chryssoula Drouza, Associate Professor

Team: Smaragda Spanou (PhD student) Eleni Michailidou (PhD student);

Webpage: <http://www.cut.ac.cy/abf/staff//chryssoula.drouza>

Food quality has direct impact on human health consisting a major concern of the consumers worldwide. Food chemistry is involved in both elucidating the composition of the raw material / final products and the changes occurring in food during its production, processing, storage and cooking.

A comprehensive evaluation of foods requires that analytical techniques are evolved with the available technology. As a result, a major objective in food chemistry is concerned with the application and continuous development of analytical methods. This aspect is particularly important when following possible contamination of foods with substances which may involve a health risk or interfere with the fraud in nutrient evaluation of food. Food authenticity and classification is of high concern for the consumers, the government and the public financial sector of a country. Furthermore, our group has developed new technology in the preparation of new radical initiators for the investigation of the stability of food using Electron Paramagnetic Spectroscopy (EPR) as well for use as chemoprevention / anticancer agents

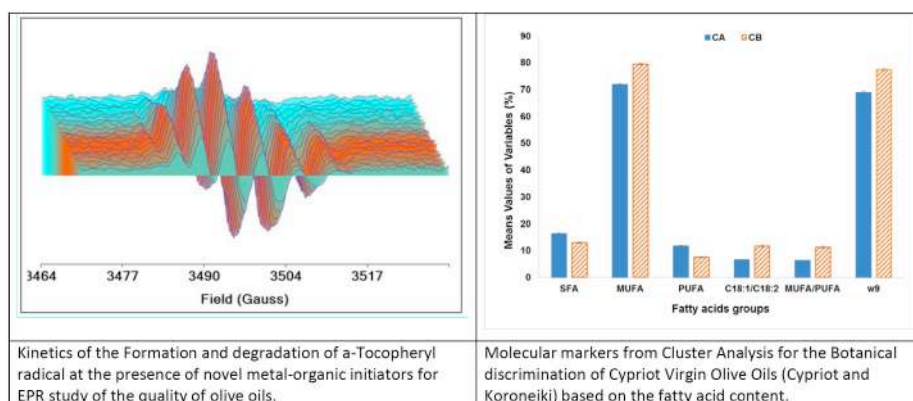
Our research group has extensive research experience in issues related to food composition, chemical changes of food as part of processing or storage, and developing methods to trace important biomolecules in the food matrix, and classification of food, and radical initiators' development. Therefore, our research group has been involved in the following research projects:

(a) Investigation for the determination of markers for the discrimination/authenticity of food, such as olive oil, wine, honey and other food products (b) Study of the mechanisms of food oxidation (c) Study of the changes in the composition of food and its metabolites during processing, aging and/or storage (d) Development of new methods for the analysis of food components with high impact to the adulteration, authenticity and deterioration of food (e) development of new radical initiators based on food components for chemoprevention /anticancer studies

To match these targets in our group we utilise several advanced techniques such (i) chromatographic: gas chromatography (GC-MS/FID), High Performance liquid chromatography (HPLC-PDA/fluorescence/RI/UV, and (ii) spectroscopic: ^1H (1 and 2D), ^{13}C , ^{51}V , ^{19}F , ^{31}P Nuclear Magnetic spectroscopy (NMR), Electron Paramagnetic spectroscopy (EPR) UV-vis spectroscopy (iii) electrochemical: CV-voltammetry.

We have recently developed a new experimental approach for recording the composition of edible oils, by labeling its components with ^{19}F nuclei which is active in ^{19}F NMR spectroscopy providing the ability for measuring several bioactive components of edible oils in few minutes. Another new approach has been applied for the detection of bioactive components in food by utilizing new metal-organic probes to induce paramagnetic signal in the complex food matrix characteristic of its components providing quantification and/or information for the mechanism of the food deterioration under study. These new methods are being exploited to food characterization and to discriminate it on the base of the botanical and/or geographical origin, with high economic impact to the local and the international community.

Classification studies of our group have revealed the specific markers for botanical and geographical origin of Cypriot olive oils, and wines from olive trees and vines respectively of indigenous varieties.



Our network of collaborators includes partners at Aristotle University of Thessaloniki, Agricultural University of Athens, University of Ioannina, and University of Patras, Greece; University of Cyprus, Cyprus; University of Sussex, University of Limerick, Ireland; University of Lleida, Spain; and academic members from the departments of Cyprus University of Technology.

We have participated in several national and EU-funded research projects while Dr. C. Drouza has experience in coordinating funded Infrastructure research programme, which funded the purchase of an EPR spectrometer. We are members of international associations and networks including COST Action CM1305, COST Action TD1203, the International Forum on Industrial Bioprocesses (IFIBiop), and the Pancyprriot Union of Chemists.

Selected publications

- Loizou, M.; Papaphilippou, P.; Vlasίου, M.; Spilia, M.; Peschos, D.; Simos, Y. V.; Keramidas, A. D.; Drouza, C., Binuclear VIV/V, MoVI and ZnII - hydroquinonate complexes: Synthesis, stability, oxidative activity and anticancer properties. *Journal of Inorganic Biochemistry* 2022, 235, 111911
- Hadjiadamou, I.; Vlasίου, M.; Spanou, S.; Simos, Y.; Papanastasiou, G.; Kontargiris, E.; Dhima, I.; Ragos, V.; Karkabounas, S.; Drouza, C.; Keramidas, A. D., Synthesis of vitamin E and aliphatic lipid vanadium(IV) and (V) complexes, and their cytotoxic properties. *Journal of Inorganic Biochemistry* **2020**, 208, 111074.
- Loizou, M.; Hadjiadamou, I.; Drouza, C.; Keramidas, A. D.; Simos, Y. V.; Peschos, D., Vanadium(V) Complexes with Siderophore Vitamin E-Hydroxylamino-Triazine Ligands, *Inorganics* **2021**, 9(10), 73; <https://doi.org/10.3390/inorganics9100073>, 73
- Drouza, C.; Dieronitou, A.; Hadjiadamou, I.; Stylianou, M., Investigation of Phenols Activity in Early Stage Oxidation of Edible Oils by Electron Paramagnetic Resonance and ^{19}F NMR Spectroscopies Using Novel Lipid Vanadium Complexes As Radical Initiators. *Journal of Agricultural and Food Chemistry* **2017**, 65, 4942-4951.
- Kritioti, A.; Menexes, G.; Drouza, C., Chemometric characterization of virgin olive oils of the two major Cypriot cultivars based on their fatty acid composition. *Food Research International* **2018**, 103, 426-437.
- Karabagias, I. K.; Vlasίου, M.; Kontakos, S.; Drouza, C.; Kontominas, M. G.; Keramidas, A. D., Geographical discrimination of pine and fir honeys using multivariate analyses of major and minor honey components identified by ^1H NMR and HPLC along with physicochemical data. *European Food Research and Technology* **2018**, 244, 1249-1259.



Research Group on Sustainable Dairy Production and Animal Nutrition

Head: Ouranios Tzamaloukas, Associate Professor

Team: Dr Marina Neofytou, Ms Mikaella Kyriakou and Mr Konstantinos Mouzakis (PhD candidates)

Website: Orcid ID: 0000-0001-7675-6718

Ruminant production and quality of its product is currently priority in Cyprus for both the private sector (farmers and dairy industry) and the Ministry of Agriculture. Dairy production in Cyprus needs to improve its productivity, competitiveness and sustainability by the means of best management practices, nutrition, and improved quality of the products produced. Within these objectives the research currently undertaken by our group has a significant impact on issues related to welfare, extensive production, quality of milk, alternative forages and byproducts. Our results have been presented in national and international conferences and published in high impact peer reviewed journals. This research activity can be summarized in the following subject areas and projects:

1. using by-products of olive oil production (olive cake) as a feed in ruminants and study the effect on milk production and quality and particularly the lipid profile with beneficial effects on consumers' health
2. study the effects of nutritional supplementation with alternative feeds and forages on milk yield and quality in Chios sheep and Damascus goat
3. investigate the interplay of nutrition and expression of genes related to metabolism in mammary and adipose tissues in ruminants
4. research on organic, regenerative and sustainable ruminant production
5. research on endangered local Cyprus cattle breed studying the management practices applied and the added value products that this breed may produce
6. investigate the welfare and the optimum management practices and precision livestock farming systems for sustainability, animal well-being and quality of the products.



Example of the by-products used in experiments for the improvement of lipid content of ruminant milk. Here is pictured the olive cake produced by an ensiling method

|  | OC0 | OC10 | OC20 | SEM | p |
|---|--------------------|---------------------|--------------------|-------|-----|
| C4:0 | 0.80 ^a | 0.72 ^b | 0.75 ^{ab} | 0.01 | * |
| C6:0 | 1.53 ^a | 1.37 ^b | 1.45 ^{ab} | 0.04 | ** |
| C8:0 | 2.32 ^a | 2.13 ^b | 2.15 ^b | 0.05 | ** |
| C10:0 | 5.79 ^b | 6.69 ^a | 5.37 ^b | 0.28 | ** |
| C10:1 cis-9 | 0.21 ^a | 0.16 ^b | 0.17 ^b | 0.008 | *** |
| C12:0 | 4.09 | 4.06 | 3.76 | 0.12 | † |
| C14:0 | 9.00 ^a | 8.47 ^b | 8.05 ^b | 0.15 | *** |
| C16:0 | 25.39 ^a | 22.89 ^b | 22.37 ^b | 0.38 | *** |
| C16:1 cis-9 | 0.13 ^b | 0.15 ^b | 0.18 ^a | 0.008 | *** |
| C18:0 | 10.40 | 10.12 | 10.35 | 0.46 | NS |
| C18:1 trans-10 | 0.31 ^b | 0.37 ^{ab} | 0.39 ^a | 0.01 | *** |
| C18:1 trans-11 | 4.75 ^b | 5.70 ^a | 6.12 ^a | 0.26 | *** |
| C18:1 trans-12 | 0.33 ^c | 0.41 ^b | 0.68 ^a | 0.05 | *** |
| C18:1 cis-9 | 18.48 ^c | 21.12 ^b | 23.05 ^a | 0.49 | *** |
| C18:2n-6 | 4.58 | 4.59 | 4.69 | 0.18 | NS |
| C18:3n-3 | 0.35 | 0.36 | 0.38 | 0.01 | NS |
| CLA cis-9, trans-11 | 0.41 ^c | 0.46 ^b | 0.52 ^a | 0.01 | *** |
| SFA | 65.51 ^a | 62.46 ^b | 59.68 ^c | 0.69 | *** |
| MUFA | 29.92 ^b | 30.88 ^{ab} | 32.98 ^a | 0.64 | ** |
| PUFA | 6.44 | 6.43 | 6.74 | 0.22 | NS |
| Atherogenic index | 1.16 ^a | 1.03 ^b | 0.92 ^b | 0.03 | *** |

Example of the improvement of lipid content of milk when goats fed ensiled olive oil by-product.

The results showed that milk was enriched with beneficial for human health lipids (MUFA, oleic, CLA) on the expense of saturated lipids (SFA) and these attributes were transferred to the Halloumi cheese

Our group have participated in several national and international projects, funded by national and international bodies as well as projects funded and supported by the local dairy and feed industry, the ministry of Agriculture and non-governmental organizations. We have developed an extensive network of local farmers and research institutes, acting as members in committees of national bodies (Ministry of Agriculture) and internationally, in associations involved in animal, dairy and sustainable production. Our group also has extensive activities in exchanging knowledge, students and research associates for the needs of collaborative research through Erasmus+, COST actions and other funding bodies, while the interaction is very active between our group and globally known institutions.

Selected publications

1. Simitzis, P.; Tzanidakis, C.; Tzamaloukas, O.; Sossidou, E. (2022). *Contribution of Precision Livestock Farming Systems to the Improvement of Welfare Status and Productivity of Dairy Animals*. **Dairy** 3(1), 12-28.
2. Silva, S.R; Sacarrão-Birrento, L.; Almeida, M.; Ribeiro, D. M; Guedes, C.; González Montaña, J. R.; Pereira, A.F; Zaralis, K.; Geraldo, A.; Tzamaloukas, O.; *Extensive sheep and goat production: The role of novel technologies towards sustainability and animal welfare*. **Animals**,12,(7), 885, 2022
3. Tzanidakis, C.; Tzamaloukas, O.; Simitzis, P.; Panagakis, P.; *Precision livestock farming applications (PLF) for grazing animals*, **Agriculture**, 13,2,288, 2023,
4. Neofytou, M.C; Hager-Theodorides, A.; Sfakianaki, E.; Simitzis, P.; Symeou, S.; Sparaggis, D.; Tzamaloukas, O.; Miltiadou, D.; *The Dietary Inclusion of Ensiled Olive Cake Increases Unsaturated Lipids in Milk and Alters the Expression of Lipogenic Genes in Mammary and Adipose Tissue in Goats*, **Animals**, 13, 21, 3418, 2023



Research Group on Natural Products Analysis & Processing

Head: Vlasios Goulas, Assistant Professor

Team: Dr Atalanti Christou, Dr Themistoklis Venianakis, Constantina Stavrou, Fotini Nikola, Aristi Alkiviadi, Alexandros Kosti, Argiro Evlavi

Website: <https://npap-lab.com/>

The Natural Products Analysis and Processing Research Group of the Cyprus University of Technology has a unique expertise in the areas of natural products and plant-based foods. The research group is active in the field of medicinal plants, natural products, and functional food science. The research activity of group involves three interrelated areas pillars:

- evaluation of the bioactive composition and bioactivity of natural products and plant-based foods
- discovering novel bioactive compounds and/or extracts for food industry and pharmaceuticals
- the impact of processing on stability of bioactive compounds and bioactivity in natural products and plant-based foods

Plants are an inexhaustive reservoir of phytochemicals with diverse biological activities ameliorating health disorders, preventing diseases, and conserving foods. The evaluation of bioactivity of plants has proven to be a helpful and fruitful strategy in the search for new active compounds. The elucidation of the phytochemical compositions of plant extracts is of great importance for both the discovering new lead compounds and understanding their mechanisms of action. The study of phytochemical composition of natural products and plant-based foods is one the major objectives of the research group. In period 2022-2024, the phytochemical composition and the potential inhibitory effects of native medicinal plants and agri-food byproducts on pathogenic bacteria and diabetes related enzymes were thoroughly studied building an extend plant extract library.

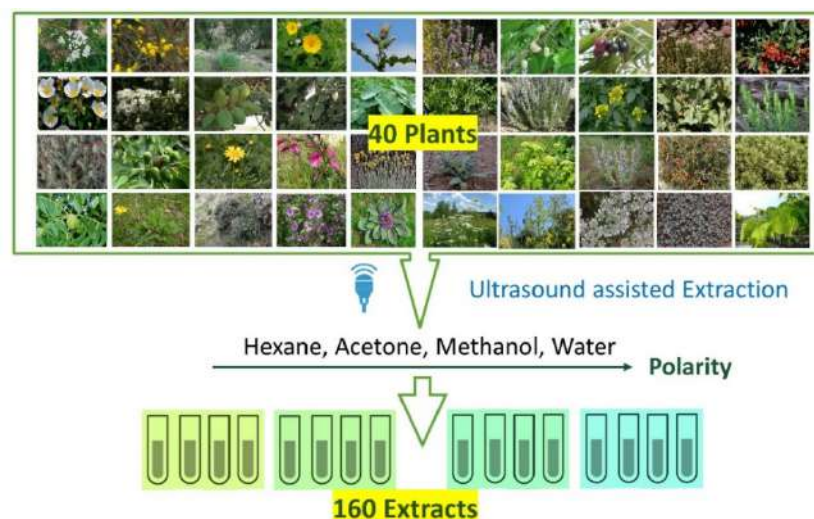


Figure 1. Screening strategy for the evaluation of phytochemical composition and bioactivity of native plants

The plant extract library was also utilized in order to “fish” new bioactive compounds/ fractions. An advanced platform of dual high-resolution antidiabetic and antimicrobial inhibition profiling techniques, powerful 1D and 2D NMR techniques for the identification and quantification of phytochemicals, biophysical techniques for probing interaction of active compounds with target-molecules and in silico tools for bioactivity prediction was used to pinpoint bioactive compounds/ fractions and to decipher the biological targets and mechanisms of action of active molecules. Special attention was given in native plants in Cyprus as *Ceratonia siliqua* L., *Cistus salvifolius* L., *Pistacia lentiscus* L. and *Sarcopoterium spinosum* (L.) Spach.

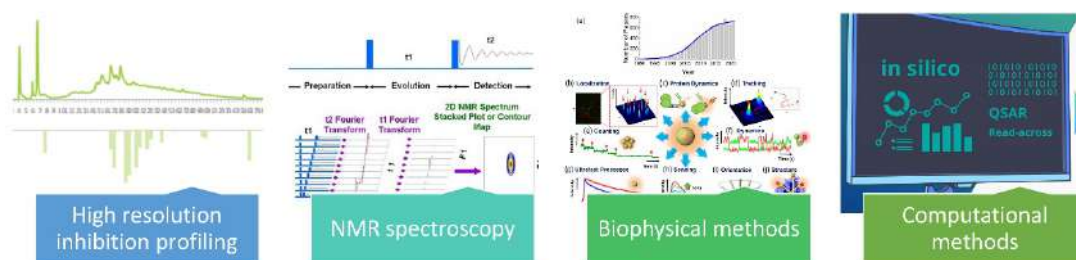


Figure 2. Integrated approaches for discovering novel bioactive compounds from natural products.

The use of bioactive compounds/ fractions in different commercial sectors such as food pharmaceutical, and cosmetic industries signifies the need of the most appropriate and standard method to extract these active components from plant materials. According to the goals of Green Chemistry and Sustainable Development, innovative, sustainable, and environmentally friendly extractions was developed to recovery of phytochemicals from medicinal plants and agri-food byproducts such as *Commandaria* winery wastes and taro (kolokasi) by-products. In particular, an array of green and sustainable extraction processes by combining ultrasound irradiation and green solvents as natural deep eutectic solvents (NaDESs) and cyclodextrins were developed using response surface methodology. Thus, these green extraction methods deliver phytochemical-enriched extracts readily applicable to food and cosmeceutical formulations.

The Natural Products Analysis and Processing Research Group also studies the physicochemical properties, phenolic composition and bioactivity of Cypriot honey. This integrated approach is expected to provide a knowledge base for the properties of Cypriot honeys. Furthermore, the phytochemical fingerprint of honey can be also exploited as markers for botanical and geographical origin. In addition, our research group participates in an international consortium for the development protocols for the certification of antioxidant potency in many horticultural products such as olive oil, olive fruits, honey, aromatic plants, raisins, chestnuts and garlic bulbs. The impact of shelf-life on antioxidant

potency of horticultural products was also investigated providing useful guidelines for their storage.

A network of collaborators including partners at Research and Development of Functional Food Centre (CIDAF) and UCAM Universidad Católica de Murcia in Spain, Faculty of Medicine and Department of Chemistry in Ioannina (Greece) and International Center for Chemical and Biological Sciences in Pakistan has been established. In addition, synergies with other members of Academic staff at ABF Department and local organizations such as Department of Agriculture (Quality Products Section) have been established. Finally, the Natural Products Analysis and Processing Research Group participate in national and international funded research projects and active members of international associations and networks.

Selected Publications

1. Venianakis, T.; Parisis, N.; Christou, A.; Goulas, V.; Nikoloudakis, N.; Botsaris, G.; Goričan, T.; Grdadolnik, S.G.; Tzakos, A.G.; Gerothanassis, I.P. Phytochemical Analysis and Biological Evaluation of Carob Leaf (*Ceratonia siliqua* L.) Crude Extracts Using NMR and Mass Spectroscopic Techniques. *Molecules* 2024, 29, 5273.
2. Stavrou, K.; Christou, A.; Goulas, V. Optimization of Green Sample Preparation for the Determination of Hydroxycinnamic Acids in Multi-Floral Honey Using Response Surface Methodology. *Appl. Sci.* 2024, 14, 5781.
3. Christou A, Stavrou C, Michael C, Botsaris G, Goulas V. Antibacterial and Carbohydrate Digestive Enzyme Inhibitory Effects of Native Plants Used for Medicinal and Culinary Purposes in Cyprus. *Nat. Prod. Com.* 2024;19, 1-13.
4. Christou, A.; Parisis, N.A.; Venianakis, T.; Barbouti, A.; Tzakos, A.G.; Gerothanassis, I.P.; Goulas, V. Ultrasound-Assisted Extraction of Taro Leaf Antioxidants Using Natural Deep Eutectic Solvents: An Eco-Friendly Strategy for the Valorization of Crop Residues. *Antioxidants* 2023, 12, 1801.
5. Goulas, V.; Banegas-Luna, A.J.; Constantinou, A.; Pérez-Sánchez, H.; Barbouti, A. Computation Screening of Multi-Target Antidiabetic Properties of Phytochemicals in Common Edible Mediterranean Plants. *Plants* 2022, 11, 1637.



Research Group on Plant Pathology, Plant Microbe Interactions

Head: Iakovos Pantelides, Assistant Professor

Team: Stavroula Dimitriadi, Krystallia Komninaki, Christodoulos Panagiotou

Plant growth is constantly challenged by pathogenic microbes and unfavorable environmental conditions. Each year, approximately 25% of global crop yields are lost due to diseases caused by fungi, bacteria, viruses and other pathogens, as well as pests. Traditionally, plant protection has relied on chemical pesticides, which, despite their effectiveness, pose risks to human health and the environment. To mitigate these risks and reduce dependence on chemical inputs, sustainable disease management strategies have been developed.

A key approach is Integrated Pest Management (IPM), which combines knowledge of pathogen life cycles, plant-microbe interactions and environmental factors to design effective, non-chemical disease control strategies. Among these, biological control - the use of beneficial microbes to suppress pathogens - is gaining significant attention. Understanding the complex relationships between plants and microorganisms, whether antagonistic or symbiotic, is essential for developing innovative, eco-friendly plant protection solutions.

Research Focus Areas

Our research explores various aspects of Plant Pathology and Biotechnology, with an emphasis on sustainable plant protection and microbial interactions. Specifically, we focus on:

Beneficial Microbes: Identification, evaluation, and application of plant-associated microorganisms that promote growth and enhance disease resistance through the production of antimicrobial compounds, hormones, and plant growth-stimulating enzymes.

Microbial Interactions & Plant Immunity: Investigation of the molecular mechanisms governing plant-microbe interactions, including pathogen virulence factors, plant immune responses and beneficial symbiotic relationships.

Eco-Friendly Disease Management: Development and assessment of sustainable disease control methods that minimize reliance on synthetic pesticides.

Microbiome Engineering & Sustainable Agriculture: Designing innovative strategies to manipulate plant-associated microbial communities to improve plant health and enhance agricultural productivity under environmentally friendly conditions.

Research Impact and Collaborations

Our research findings have been presented at international conferences and published in peer-reviewed journals. We actively participate in numerous national and international research projects, strengthening our contribution to the global scientific community.

The team maintains strong international collaborations, including partnerships with Utrecht University (Netherlands), Pennsylvania State University (USA), Universidad de Málaga (Spain) and Agricultural

University of Athens (Greece). Additionally, we engage with the local agricultural sector to address real-world challenges. Collaborations with governmental plant protection services, private-sector agronomists and industry partners ensure that our research translates into practical solutions for monitoring and controlling plant diseases.

The senior researcher is also actively involved in leading scientific societies and networks, including The American Phytopathological Society (APS, Member), International Society for Molecular Plant-Microbe Interactions (IS-MPMI, Member), Mediterranean Phytopathological Union (MPU, Member), Hellenic Phytopathological Society (HPS, Vice President). Furthermore, our team has experience in hosting international exchange students through Erasmus+ programs, fostering academic exchange and collaboration across borders.

By integrating fundamental research with applied solutions, we strive to advance sustainable plant disease management and contribute to the development of resilient agricultural systems.

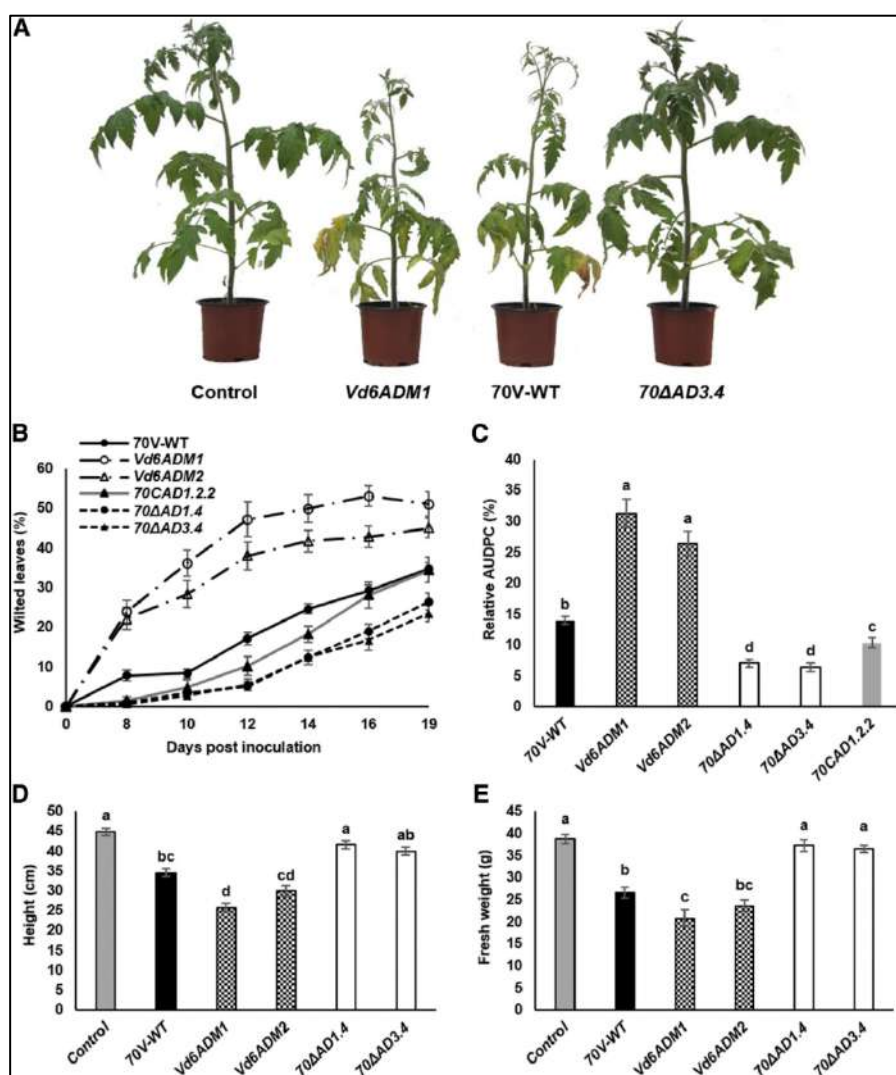


Figure 1: Disease severity of tomato plants infected with 70V-WT and 1-aminocyclopropane-1-carboxylic acid deaminase (*ACCd*) mutants. Tomato plants were inoculated with 70V-WT, deletion mutants (*70ΔAD1.4* and *70ΔAD3.4*), overexpression strains (*Vd6ADM1* and *Vd6ADM2*), and complemented deletion mutant *70CAD1.2.2*. **A**, Representative tomato plants at 19 days after inoculation. **B**, Disease progress over time, **C**, amount of disease expressed as relative area under the disease progress curve, **D**, height, and **E**, fresh weight of plants. Vertical bars indicate the standard errors based on 24 replicates. All values were subjected to analysis of variance. Different letters in C, D, and E note statistically significant differences according to Tukey's multiple range test at $P \leq 0.05$.

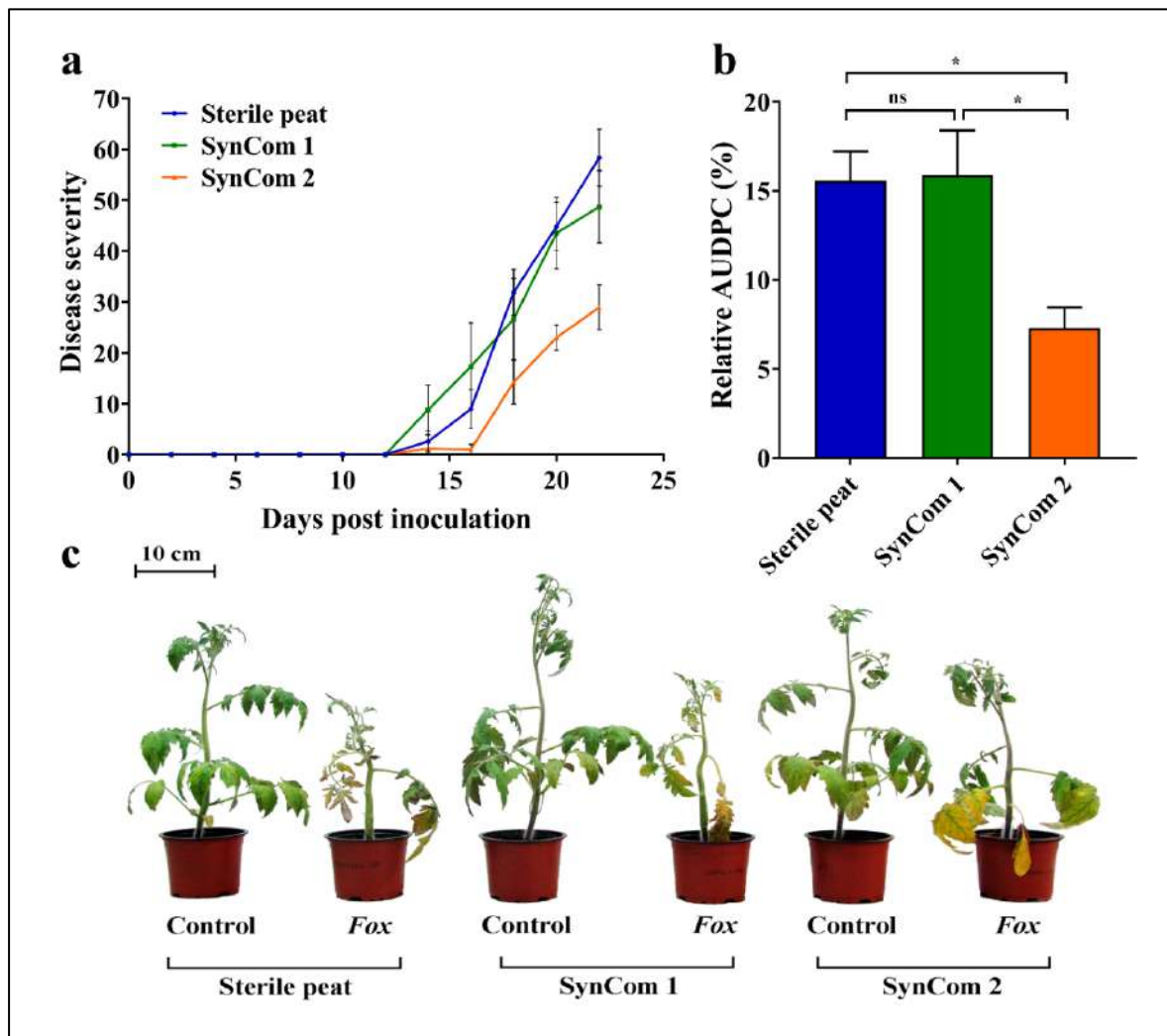


Figure 2: SynCom2 has a protective effect on tomato plants against *F. oxysporum* f. sp. *lycopersici*. (a) Disease progress over time and (b) amount of disease expressed as relative AUDPC. Error bars indicate the SE of mean ($n = 8$ replicates). Asterisks indicate statistically significant differences: $*P < 0.05$; ns, not significant, one-way ANOVA, Tukey's test. (c) Fusarium wilt symptoms on tomato plants grown in sterile peat (left), sterile peat inoculated with SynCom1 (middle) and with SynCom2 (right), at 22 d post inoculation.

Selected publications

Karanastasi, E.; Kotsantonis, V.; Pantelides, I.S. (2024) Compost-derived bacterial communities offer promise as biocontrol agents against *Meloidogyne javanica* and promote plant growth in tomato. *Agriculture*, 14, 891

Tsolakidou, M.-D.; Demetriou, G.; Panagiotou, S.; Vassiliou, L.; Goulas, V.; Pantelides, I. (2024) Efficacy of commercial biocontrol products for the management of *Verticillium* and *Fusarium* wilt in greenhouse tomatoes: Impact on disease severity, fruit yield, and quality. *Agriculture*, 14, 882.

Pantelides, I.S.; Stringlis, I.A.; Finkel, O.M.; Mercado-Blanco, J. (2023) Editorial: Organic amendments: microbial communities and their role in plant fitness and disease suppression. *Frontiers in Plant Science*, 14, 1213092.

Zampieri, E.; Pantelides, I.S.; Balestrini, R. (2022) Biofertilizers: assessing the effects of plant growth-promoting bacteria (PGPB) or rhizobacteria (PGPR) on soil and plant health. In Horwath, William R. (ed.), *Improving soil health*, Burleigh Dodds Science Publishing, Cambridge, UK.



Research Group on Agricultural Biotechnology/ Genetic Resources & Crop Evolution

Head: Nikolaos Nikoloudakis, Assistant Professor

Team: Dr Maria Tsolakidou (Post-Doc), Ahmet Gökçebel (PhD student), Anastasia Markou (MSc student), Christina Naziri, George Lazarou, Charis Djama (BSc students)

Webpage: https://www.researchgate.net/profile/Nikolaos_Nikoloudakis

Preface

Plant genetic resources operate as a genetic pool of discrete alleles that contribute to agricultural stability, providing a protective sheath for crops against growing climate change as well as biotic and abiotic stress. Aside from its role in food security, a region's flora is an irrevocably dynamic component of its cultural heritage that must be celebrated.

Because of its geographical location, Cyprus is an untapped source of diversity. The several microclimates and soil types (in a small island area), as well as the vicinity of eastern Mediterranean continental lands, have resulted in a diversification boost. As a result, Cyprus is home to approximately 1700 plant species, many of which are endemic (140). Aside from wild species, plants with agricultural potential are classed as Crops Wild Relatives (CWRs) or local populations (Landraces). As a result, the potential for understanding and harnessing this mostly understudied genetic material appears tremendous.

Present engagements and future goals

Our team seeks to unravel the genetic and biochemical concepts of the aforementioned agriculturally significant species in relation to the genomic dissection of the regional genetic structure employing biotechnology. Furthermore, we hope to generate strong evolutionary findings related to adaptability in specific edaphoclimatic features. This will allow us to target specific qualities, reintroducing local neglected germplasm into agricultural production and improving crop quality. On the other hand, it will contribute to a better understanding of the genomic interplay of evolutionary and adaptational factors, as well as genomic and phenotypic plasticity. In the current period (2022-2024) previous projects were completed, and novel goals were initiated:

- Characterization and assembly of a core collection of Cypriot wheat germplasm. Association of agronomical traits and evaluation of elite genotypes (Ahmet Gökçebel)
- Cloning of defensin isoforms and recombinant protein production in an *E. Coli* heterologous expression system (Vasilios Polyviou)
- C-values across a Cypriot *Allium* spp population (George Lazarou)
- Genetic characterization of a local *phaseolous* spp collection (Christina Nasiri)
- Updating morphological descriptors for oat cultivars (Chrysoulla Nikodemou)
- Root architecture of Xynisteri under abiotic stress (Charis Djama)
- Detection of nuclear content variability in grapevine cultivars using flow cytometry (Anastasia Markou, Constantina Andreou)

Funding

Active participation in competitive EU-funded/National projects as a partner and CUT's PI*
BIOVALUE (Horizon 2020), ECOREADY (Horizon Eu), UMORPHEAS (ECPGR), Natura (RIF), Phenotypos* (RIF), TraCEREAL* (RIF), AENAON* (Interreg)

Selected publications

Michael, K., Andreou, C., Markou, A., Christoforou, M, Nikoloudakis, N. A Novel Sorbitol-Based Flow Cytometry Buffer Is Effective for Genome Size Estimation across a Cypriot Grapevine Collection (2024) *Plants*, 13, 733.

Di Gregorio, L., Nolfi, L., Latini, A., Nikoloudakis, N., Bunnefeld, N., Notarfonso, M., Bernini, R., Manikas, I., Bevivino, A. Getting (ECO)Ready: Does EU Legislation Integrate Up-to-Date Scientific Data for Food Security and Biodiversity Preservation Under Climate Change? (2024) *Sustainability*, 16, 10749.

Taheri-Garavand, A., Beiranvandi, M., Ahmadi, A., Nikoloudakis, N. Predictive modeling of *Satureja rechingeri* essential oil yield and composition under water deficit and soil amendment conditions using artificial neural networks (ANNs) (2024) *Comput Electron Agric* 222:109072.

Charalambous, I., Ioannou, N., Kyratzis, A.C., Kourtellarides, D., Hagidimitriou, M., Nikoloudakis, N. Genome Size Variation across a Cypriot Fabaeae Tribe Germplasm Collection (2023) *Plants*, 12 (7), art. no. 1469.

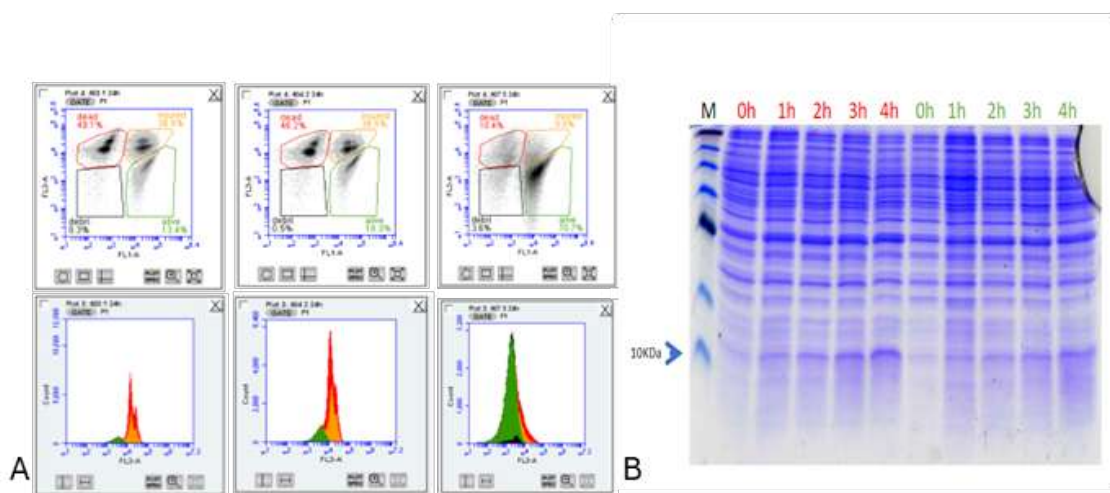


Figure 1 (A) Antimicrobial properties (details) of tomato defensin peptides against Gram⁺ bacteria as depicted via flow cytometry and PI/TO staining. **(B)** Best candidates were cloned and expressed in an *E. coli* heterologous system.

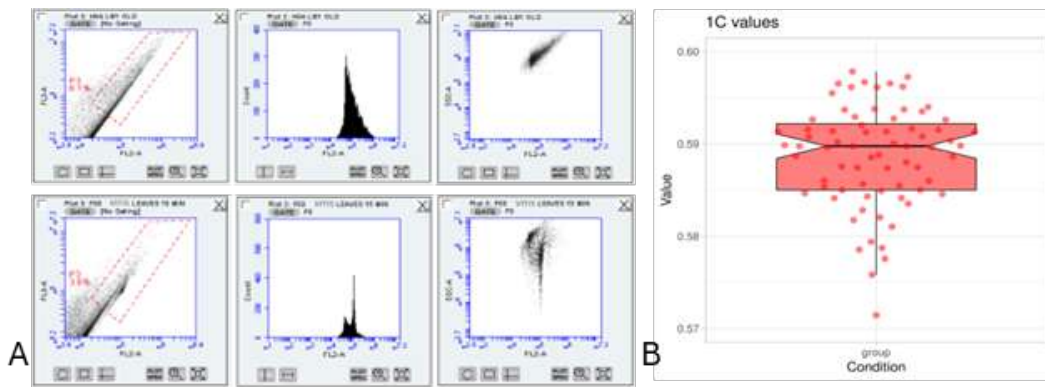


Figure 2 (A) A novel flow cytometry buffer for recalcitrant tissues (*Vitis vinifera*) was formulated and tested against standard nuclei isolation buffers. Superior CV values were established. **(B)** Flow cytometry analysis was then conducted across the Cypriot grapevine germplasm, and an astonishing C-value variation was determined.

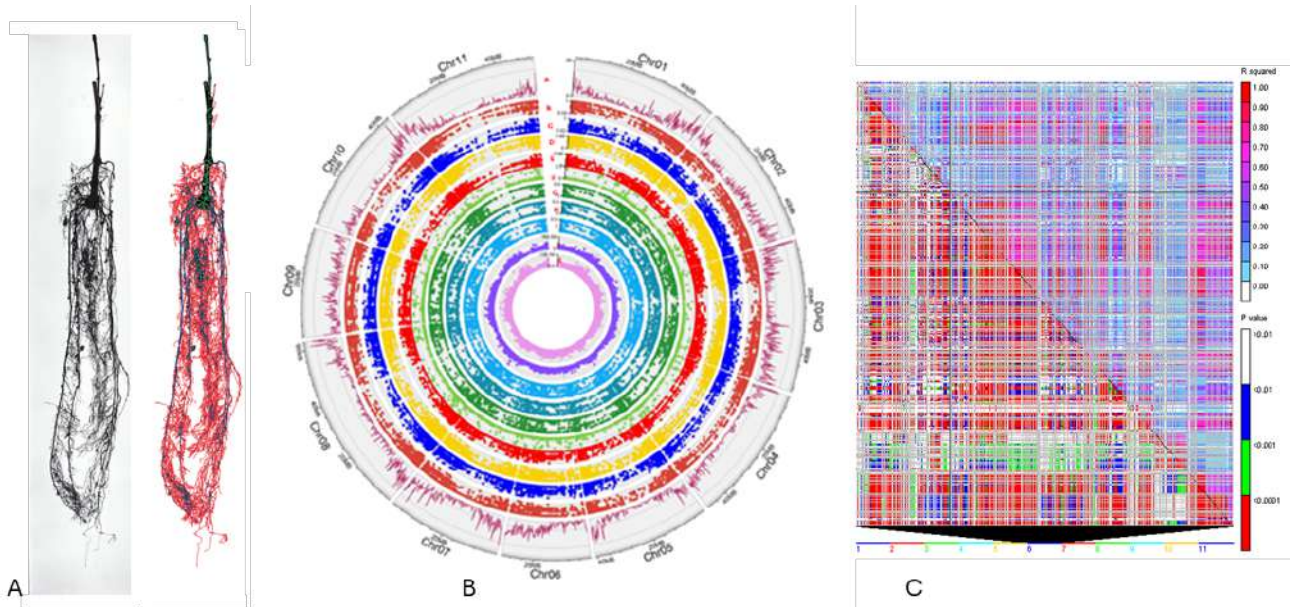


Figure 3. Focus on Cypriot germplasm. **(A)** Root architecture of cv 'Xynisteri' (one-year-growth) analyzed using dedicated software and high throughput phenotyping. **(B)** Circos across the 11 chromosomes of *Phaseolus vulgaris* and SNP density in the Cypriot bean collection using DARTseq. **(C)** Linkage disequilibrium as determined across SNP positions. Several disease-resistance alleles were determined.

SMART-AGRI: Sustainable Management and Applied Research in The AGRI-Food Systems

Head: Yiorgos Gadanakis, Assistant Professor (***hired in 2025**)

Team: PhD Candidate, Rachel Archer (Co-Supervising with Prof. Julian Park in the University of Reading), PhD Candidate, Lottie Hawkins (Co-Supervising with Prof. Tom Sizmur in the University of Reading)

Website: <https://orcid.org/0000-0001-7441-970X>

The SMART-AGRI: Sustainable Management and Applied Research in The AGRI-Food Systems lab, aims to advance sustainable management and applied research in agri-food systems. It is a recently created lab (January 2025) and unique in terms of its aims and objectives within the department since it is the lab leader is the only applied agricultural economist within ABF department. The lab adopts a systems approach to understand the complex challenges faced by farmers and identify opportunities for improvement. It promotes sustainable intensification practices that enhance productivity while minimizing environmental impact. By investigating agricultural, environmental, and behavioural economics across the food chain, the lab provides insights to optimize resource use, reduce waste, and improve economic viability. Additionally, SMART-AGRI supports effective, efficient, and resilient management of agribusinesses through the development of tools and strategies, along with training and support for agribusiness managers. The lab also fosters innovation and entrepreneurship in the agri-food sector, encouraging the development and commercialization of new technologies, products, and business models that drive sustainable growth and competitiveness.

The lab's research objectives can be summarised in the following:

- Systems approach in understanding the challenges and identifying the opportunities for farmers
- Sustainable Intensification of farming systems
- Agricultural, environmental and behavioural economics across the food chain
- Supporting effective, efficient and resilient management of agribusinesses
- Innovation and entrepreneurship in the agri-food sector.

The SMART-AGRI lab plays a crucial role in advancing research in Cyprus and Mediterranean agricultural sector by addressing the unique agricultural challenges of the region and promoting sustainable practices. The lab's systems approach helps to understand and tackle the complex issues faced by farmers, such as water scarcity, soil degradation, and the impacts of climate change. By identifying opportunities for improvement, the lab supports the development of more resilient and productive farming systems. It ensures that agricultural productivity is enhanced while minimizing environmental impact which is particularly important in Cyprus and the broader Mediterranean basin, where the balance between agricultural output and natural resource conservation is vital for long-term sustainability. These insights are essential for creating efficient and resilient agricultural practices that can withstand economic and environmental shocks.

Current contributions to research projects:

- EIT FOOD: Food Solutions 2025, Provision of innovation & entrepreneurship content education to all participating students by providing online sessions and training
- European Commission Horizon Europe (HORIZON) – Innovation Action, Sustainable renewable energy Value chains for answering farmer's needs (VALUE4FARM)
- European Union's Horizon 2020 research and innovation programme under grant agreement No 727473" Towards Sustainable Food Systems ERA-NET "Climate Smart Dairy: Assessing Challenges, Innovations and Solutions"
- UKRI: "Transformational blueprint for a blue economy on UK terrestrial farms: integrating sustainable shrimp production in a changing agricultural landscape"

Selected Publications

1. Bulasheva, A., Gadanakis, Y., & Rahman, S. (2025). Dual Learning Dynamics: Career Options for Agri-Food Students in Kazakhstan. *International Journal of Training and Development*. <https://doi.org/10.1111/IJTD.12363>
2. Pavlenko, T., Argyropoulos, D., Arnoult, M., Engel, T., Gadanakis, Y., Griepentrog, H. W., ... Paraforos, D. S. (2024). Stimulating awareness of Precision Farming through gamification: The Farming Simulator case. *Smart Agricultural Technology*, 9, 100529.
3. Bulasheva, A., Gadanakis, Y., & Rahman, S. (2024). Advancing the dual learning system in Kazakhstan: Perspectives of agri-business sector employers. *International Journal of Training and Development*, 28(4), 404–429.
4. Gadanakis, Y. (2024). Advancing Farm Entrepreneurship and Agribusiness Management for Sustainable Agriculture. *Agriculture (Basel)*, 14(8), 1288.
5. Iakovidis, D., Gadanakis, Y., Campos-Gonzalez, J., & Park, J. (2024). Optimising decision support tools for the agricultural sector. *Environment, Development and Sustainability*.
6. Gadanakis, Y., Campos-González, J., & Jones, P. (2024). Linking Entrepreneurship to Productivity: Using a Composite Indicator for Farm-Level Innovation in UK Agriculture with Secondary Data. *Agriculture (Basel)*, 14(3), 409.



Research Group on Food Microbiology and Bioactivities

In the ever-evolving field of Food Science and Microbiology, our research group is at the forefront of innovation, focusing on three interrelated areas that hold the potential to revolutionize food safety, nutrition, and functionality. Through our multidisciplinary approach, we explore the intersection of microbiology and food technology to enhance the quality and health benefits of food products. Our work focuses on the isolation and application of bacteriocins, the development of functional fermented beverages, and understanding the effects of food processing and gastrointestinal digestion (in vitro) on bioactive compounds.

Harnessing Bacteriocins for Safer Foods

Bacteria are a vital part of our bodies, both inside and outside of us. However, some bacteria (pathogens) can be harmful and cause disease. Antibiotics have been used in the fight against pathogens and in the treatment of diseases, and the development of antibiotic-resistant strains around the world poses challenges in these treatments. Therefore, there is an urgent need to develop new antimicrobial agents to combat antibiotic resistance.

Bacteriocins, antimicrobial peptides produced by bacteria, are gaining recognition as natural preservatives with the potential to replace synthetic additives in food products. Our group is dedicated to the isolation, characterization, and application of these powerful compounds to enhance food safety. By identifying bacteriocins from various microbial sources especially lactic acid bacteria, we aim to develop targeted solutions to combat foodborne pathogens. Our research focuses on optimizing the effectiveness of bacteriocins in different food matrices, ensuring their stability and efficacy under various storage and processing conditions. Ultimately, our goal is to integrate bacteriocins into food systems to extend shelf life and maintain food safety while reducing reliance on chemical preservatives.

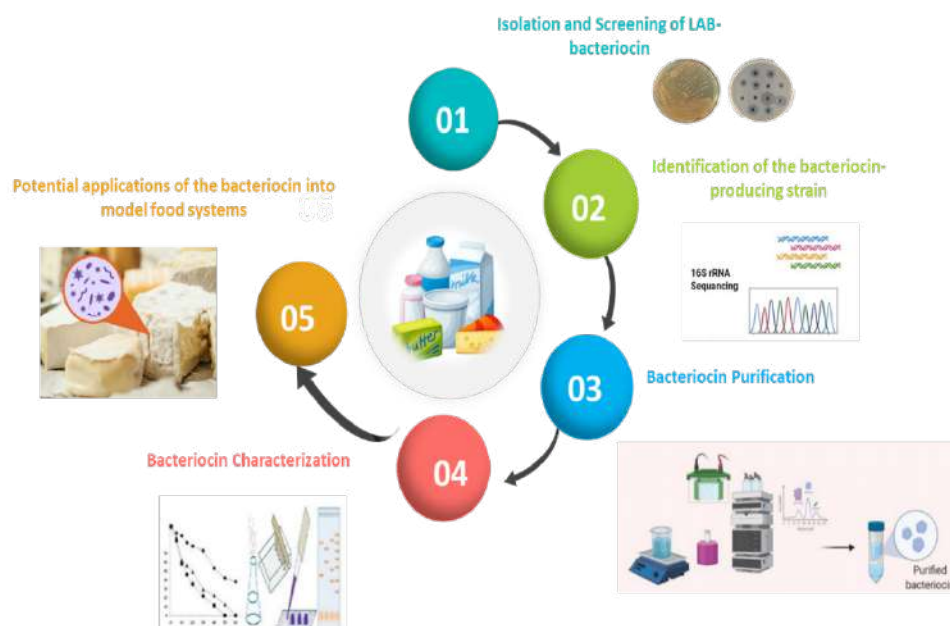


Figure 1: Protocol for the isolation and characterization of bacteriocins

Developing Functional Fermented Beverages

The notion that food could serve as medicine was first conceived thousands of years ago by the Greek philosopher and father of medicine, Hippocrates, who once wrote: 'Let food be thy medicine, and let medicine be the food'. Over the past several years, the focus of nutritional studies has shifted from nutrient deficiency diseases to optimizing health and preventing chronic diseases. Fermentation has long been recognized for its role in enhancing the nutritional and sensory properties of food. Our research explores the development of potential functional fermented beverages enriched with probiotics, prebiotics, and bioactive compounds. Functional foods are foods that may provide a health benefit beyond the basic function of providing nutrients. We investigate the microbial communities involved in fermentation, optimizing conditions to promote beneficial bacterial growth while enhancing the bioactive properties of the final product. Additionally, we assess the potential health benefits of these beverages, including their impact on gut health, immune function, and metabolic processes. By formulating innovative beverages with added health benefits, we aim to provide consumers with natural, functional alternatives that support overall well-being.

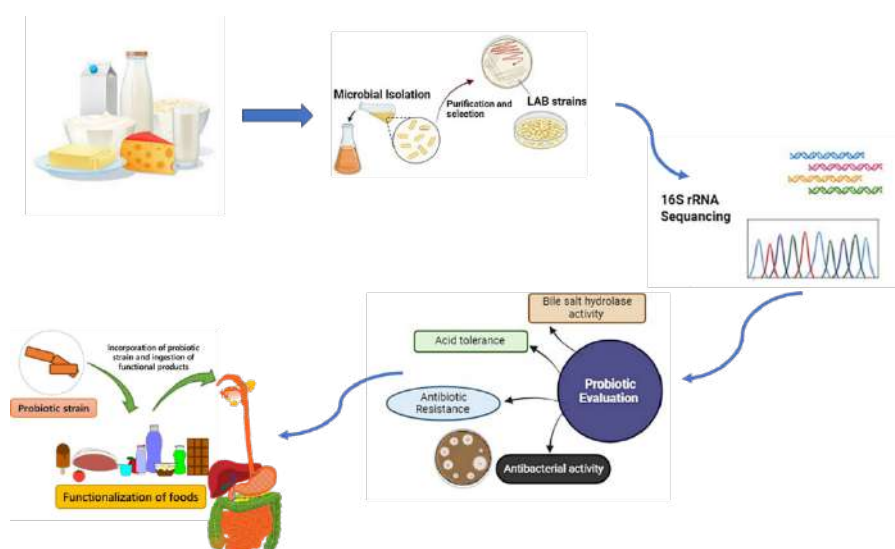


Figure 2: Characterization of probiotic bacteria and their applications in foods for the development of functional foods

Understanding Food Processing and Digestion

Food processing and digestion play crucial roles in determining the bioavailability and efficacy of bioactive compounds. Our research utilizes *in vitro* digestion models to study how different food processing techniques influence the stability and absorption of bioactive compounds and also to characterize the bioactivity of potential functional foods. This knowledge allows us to ensure that health-promoting compounds retain their bioactivity throughout the digestive process. By bridging the gap between food science and human health, our research contributes to the development of functional foods that deliver real benefits to consumers.

Rapid Detection of Food Contaminants

Recently, our group, in collaboration with other organizations, received funding through the Research and Innovation Foundation for the design and development of a novel method and related prototype to detect common milk contaminants (Aflatoxin-M1 and two antibiotics, Penicillin and Enrofloxacin) in a rapid (<10

minutes), cost-effective, and efficient manner at the farm level before milk is loaded onto trucks. This innovative technology eliminates the need for time-consuming laboratory methods or highly skilled personnel, utilizing state-of-the-art bio-photonics, customized biosensors, optical analysis, electronics, and software modules. Although this project has now concluded, it represents a significant milestone in our research efforts and demonstrates our commitment to advancing food safety through cutting-edge technology. Building on this success, we aim to expand this technology to detect other contaminants in food products, further enhancing food safety and quality control measures across the industry.

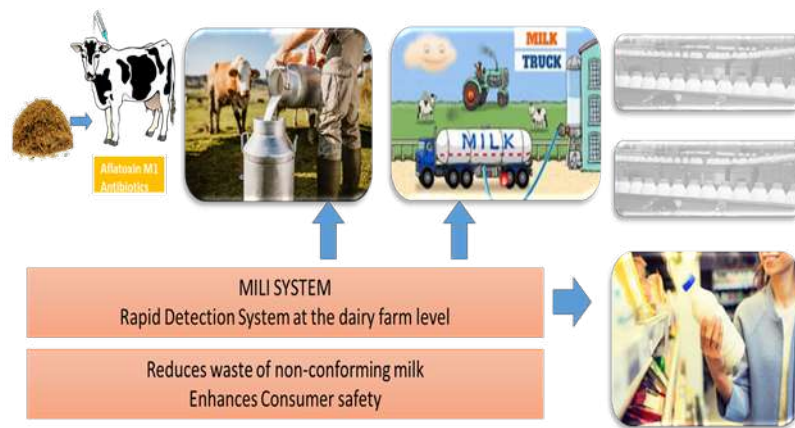


Figure 3: MILI system for the detection of milk contaminants

Selected publications

1. Aspri, M., O'Connor, P. M., Field, D., Cotter, P. D., Ross, P., Hill, C., & Papademas, P. (2017). Application of bacteriocin-producing *Enterococcus faecium* isolated from donkey milk, in the bio-control of *Listeria monocytogenes* in fresh whey cheese. *International Dairy Journal*, 73, 1-9.
2. Aspri, M., Leni, G., Galaverna, G., & Papademas, P. (2018). Bioactive properties of fermented donkey milk, before and after in vitro simulated gastrointestinal digestion. *Food Chemistry*, 268, 476-484.
3. Papademas P, Mousikos P, Aspri M. (2021) Optimization of UV-C Processing of Donkey Milk: An Alternative to Pasteurization? *Animals*. 11(1):42. <https://doi.org/10.3390/ani11010042>
4. Tedeschi, T., Aspri, M., Loffi, C., Dellafiora, L., Galaverna, G., & Papademas, P. (2023). Processing of raw donkey milk by pasteurisation and UV-C to produce freeze-dried milk powders: The effect on protein quality, digestibility and bioactive properties. *Lwt*, 173, 114404.



Research Group on Animal Nutrition

Head: Christina Mitsiopoulou, Special teaching staff

Website: <https://www.cut.ac.cy/faculties/gem/abf/staff/c.mitsiopoulou/>

The global population is continuously growing, leading to an increased demand for sustainable animal production. One of the major challenges in this field is the rising need for alternative feed resources to ensure food security while minimizing environmental impact. My research primarily focuses on developing innovative feeding strategies that enhance livestock performance, reduce reliance on conventional feedstuffs, and support a circular economy.

A key area of my research is the utilization of agricultural by-products in animal diets and their effects on livestock health, performance, and product quality. Evaluating the immunomodulatory effects of these dietary strategies—by analyzing immune-related gene expression—plays a crucial role in developing feeding strategies that reduce reliance on antibiotics while maintaining optimal animal health. Additionally, my research extends to assessing the impact of these alternative feed ingredients on meat quality parameters, such as nutrient composition, oxidative stability, sensory attributes, and shelf life. Given the growing consumer demand for high-quality, functional, and sustainably produced animal products, it is essential to explore how novel feeding strategies influence meat fatty acid profiles, protein content, and overall product safety.

Currently, efforts are being made to secure funding through proposals exploring innovative feeding strategies, such as the incorporation of insects in poultry diets and the development of circular feeds. The goal is to cultivate insects using local agricultural by-products, including those derived from dairy processing. This approach aims to reduce feeding costs and enhance feed self-sufficiency in Cyprus while improving meat quality by enriching it with beneficial bioactive compounds, such as omega-3 fatty acids and antioxidants. These initiatives align with global sustainability goals, particularly those outlined in the UN's Agenda 2030 and the European Feed Manufacturers' Federation policies.

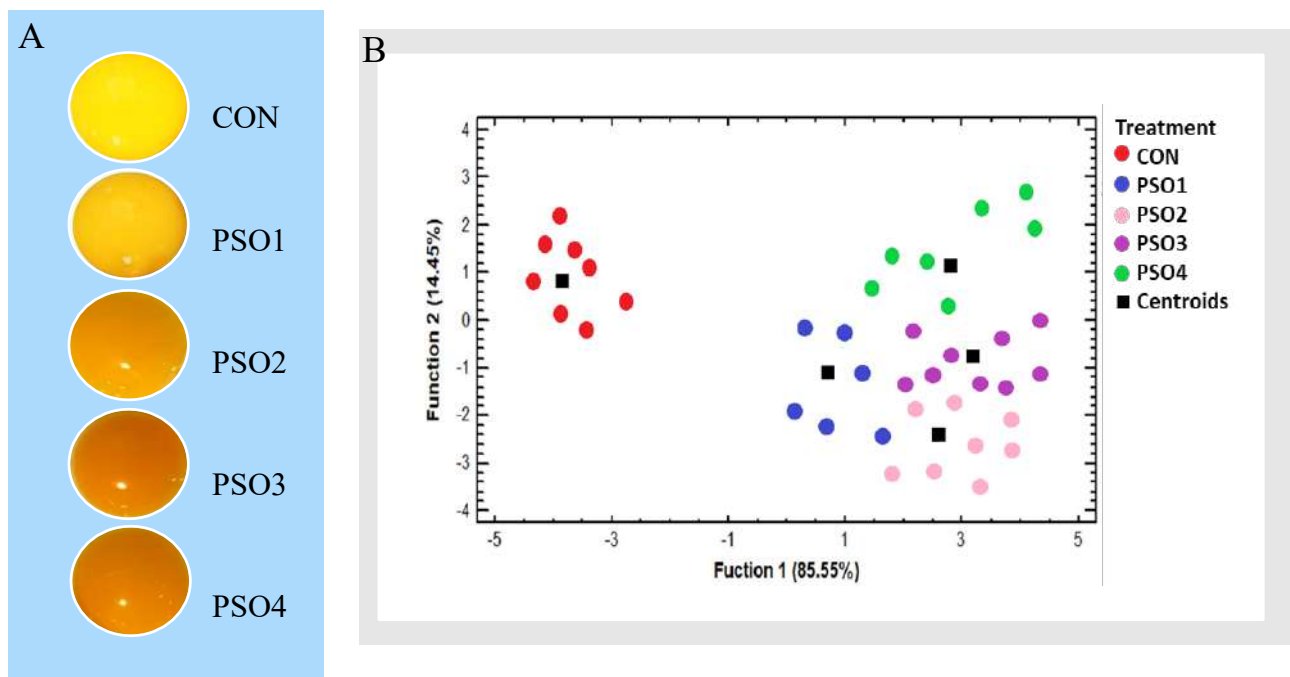


Figure 1. (A) Effect of different levels of pomegranate seed oil (PSO) inclusion on egg yolk color in laying hens. (B) Discriminant Analysis of Egg Quality Parameters: The plot shows the separation of the five dietary groups (CON, PSO1, PSO2, PSO3, PSO4) based on pooled egg quality traits.

Selected publications

Giamouri, E., Mavrommatis, A., Simitzis, P. E., Mitsiopoulou, C., Haroutounian, S. A., Koutinas, A., Pappas, A. C., & Tsiplakou, E. (2022). Redefining the use of vinification Waste By-Products in broiler diets. *Sustainability*, 14(23), 15714. <https://doi.org/10.3390/su142315714>

Pappas, A., Charisi, A., Chatziantoniou, C., Giamouri, E., Mitsiopoulou, C., Moschopoulos, V., Christodoulou, C., Papadomichelakis, G., Kotsampasi, B., Mitsopoulos, I., Tsiplakou, E., & Bampidis, V. (2023). Effects of dietary pomegranate seed oil addition to diets for laying hens on fatty acid profile of eggs. *Animal Feed Science and Technology*, 300, 115643. <https://doi.org/10.1016/j.anifeedsci.2023.115643>

Zisis, F., Giamouri, E., Mitsiopoulou, C., Christodoulou, C., Kamilaris, C., Mavrommatis, A., Pappas, A. C., & Tsiplakou, E. (2023). An overview of poultry greenhouse gas emissions in the Mediterranean area. *Sustainability*, 15(3), 1941. <https://doi.org/10.3390/su15031941>



Group of Agricultural Microbiology

Head: Dimitris Tsaltas, Professor

Member: Michalakis Christoforou, Special teaching staff

Website: <https://www.cut.ac.cy/faculties/gem/abf/staff/m.christoforou/>

Plant disease monitoring and control and monitoring is a critical component of ensuring food security, protecting biodiversity, and maintaining ecosystem health. It involves a combination of surveillance, research, policy-making, and technology use to detect, prevent, and manage plant pathogens. My research primarily focuses on soil born pest and disease detection (nematodes, bacteria and fungi) using ground and aerial tools and their control via agroecological practices.

A key area of my research is the detection and control of plant parasitic nematodes (PPNs) of the genus *Globodera* and *Meloidogyne*. Due to their persistence in soil and the negative effect of chemical nematicides on soil biodiversity, several agroecological practices are used for the control of PPNs, such as crop rotation, use of organic soil amendments, cover crops, intercropping, soil solarization, use of resistant varieties and use of biopesticides including beneficial organisms.

During the last 15 years, efforts are being made to secure EU and national funding through research proposals exploring innovative practices for the detection and control of soil born diseases and the improvement of soil biodiversity. In several research projects (Life Green Grapes, PotatoNemaCy, GOOD, Carbonica, Cascade, SWSOIP, NEMESIS etc), we aimed to control pest and diseases using agroecological practices, reducing chemical pesticides and at the same time to reduce carbon emissions and increase carbon sequestration using Carbon Farming (CF) practices.

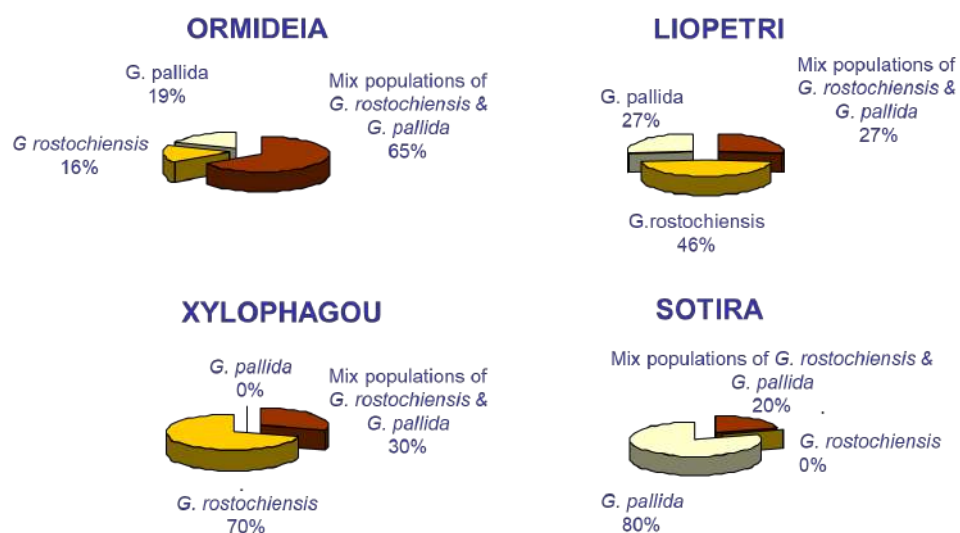


Figure 1. Potato Cyst Nematodes distribution in the South-East area in Cyprus. PCN were identified and quantified using molecular tools (real time PCR), in the four major potato growing areas in Cyprus.

Selected publications

Papachristoforou A, Prodromou M, Hadjimitsis D, Christoforou M*. 2023. Detecting and distinguishing between apicultural plants using UAV multispectral imaging. PeerJ 11:e15065 <https://doi.org/10.7717/peerj.15065>

Jucker Riva M, Baeza J, Bautista S, Christoforou M, et al. 2018. How does land management contribute to the resilience of Mediterranean forests and rangelands? A participatory assessment. Land Degrad Dev. 2018; 29: 3721–3735. <https://doi.org/10.1002/ldr.3104>.

Kanetis L., Tsimouris D. and Christoforou M. 2016. "Characterization of *Rhizoctonia solani* Associated with Black Scurf in Cyprus". Plant Disease. (doi: <http://dx.doi.org/10.1094/PDIS-10-15-1238-RE>).

Christoforou, M., Pantelides I. S., Kanetis L., Ioannou N. and Tsaltas, D. 2014. "Rapid detection and quantification of viable potato cyst nematodes using qPCR in combination with propidium monoazide" Plant Pathology Doi: 10.1111/ppa.12193.

Papayiannis, L.C., Christoforou, M., Markou, Y.M. and Tsaltas, D. 2013."Molecular typing of cyst-forming nematodes *Globodera pallida* and *G. rostochiensis*, using real-time PCR and evaluation of five methods for template preparation". Journal of Phytopathology. doi: 10.1111/jph.12091.



Research Group on Floriculture, Wild Plant Species and Fertilizers

Head: Antonios Chrysargyris, Special Teaching Staff (*hired in 2025)

Webpage: https://www.researchgate.net/profile/Antonios-Chrysargyris?ev=hdr_xprf

The research activities of the group focus on floricultural plant species, the introduction of wild and unexplored plant species (ornamental, medicinal/aromatic, edible flowers) into cultivation schemes (soil/soilless cultivations), the identification of their mineral requirements and nutritional value, and the evaluation of the biological activities of their produced extracts and essential oils.



Research on Unexplored Plant Species

About 30,000 plant species are considered edible worldwide, but only very few of them are grown or cultivated on a commercially significant scale. On the other hand, several plants or their parts (leaves, shoots, fruits, seeds, hypogean organs, and flowers) are collected in the wild and consumed as raw or cooked food. Ethnobotany may offer a source of inspiration for agriculture, as wild edible species have the potential to lead food systems to be healthier, more sustainable, and resilient to climate change. Significant tolerance to several abiotic and biotic stresses, as well as a high nutritional value and excellent nutraceutical properties are common traits of wild plants, making them promising candidates as new crops. We explore novel approaches for the outdoor/indoor cultivation, including fertilizers application, mineral needs in soil and/or soilless culture, harvesting, and storage of wild or underutilized species that would allow growers to produce new food categories, particularly those appealing to modern consumers. Cultivating wild species is also a way to preserve ethnobotanical heritage and to promote genetic diversity. Furthermore, the cultivation of food plants usually gathered in the wild could reduce the health-related risks associated with pollution and biological contaminations.

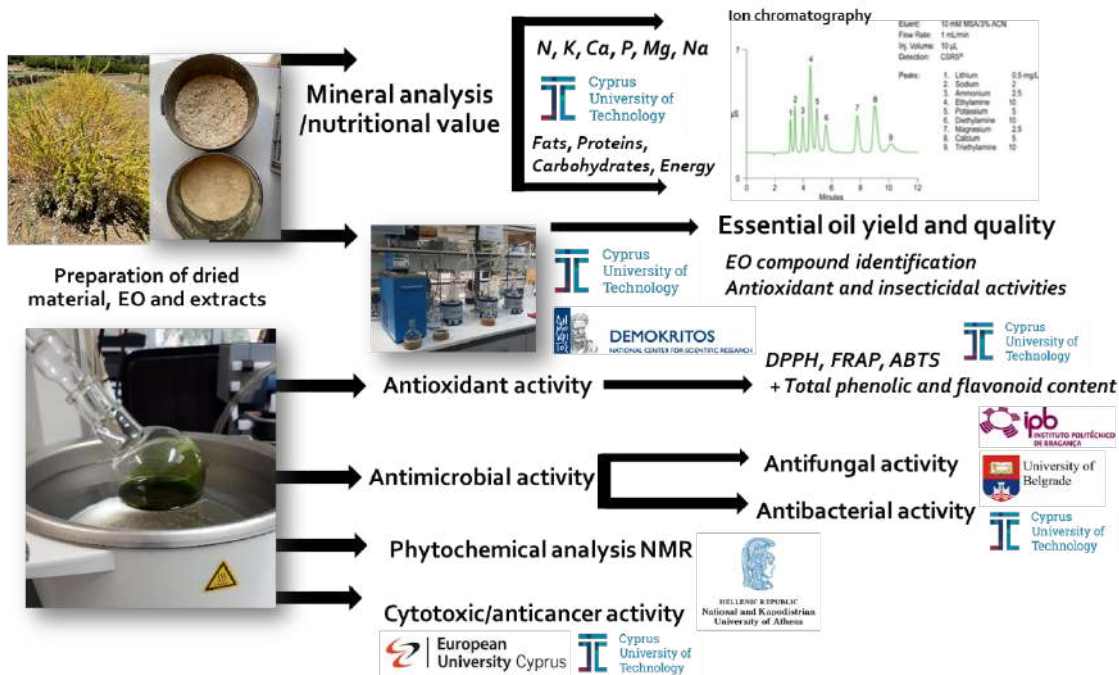


Fig. 1. A complete unexplored plant species characterization process, with selected collaborators.

Research on Floriculture, Ornamentals and Urban Agriculture

Floriculture research has recently made significant strides across various domains, integrating advanced technologies and sustainable practices to enhance the cultivation and commercialization of ornamental plants. Our research emphasizes the importance of selecting appropriate species and implementing cultivation practices that enhance the quality of the produced plants, in soil/soilless system, emphasizing the importance of fertilizers, under nursery or greenhouse conditions. For example, studies have explored the reuse of materials like olive-mill and paper waste, to grow ornamental plants sustainably. Additionally, the cultivation of floricultural plants requires careful consideration of growing conditions to ensure not only their aesthetic appeal but also the edibility of the produced flowers. Edible flowers have garnered our attention due to their potential use as nutraceutical foods and their role in diversifying horticultural products. Many ornamental plants produce flowers rich in bioactive compounds, including polyphenols and flavonoids, which exhibit antioxidant properties beneficial to human health. For instance, we have conducted a series of studies on edible flowers from ornamental species as *Viola × wittrockiana*, *Viola tricolor*, *Calendula officinalis* L., *Matthiola incana* L. among others, highlighting their nutritional value and antioxidant capacities, suggesting their potential as novel nutraceutical sources. In urban horticulture, integrating ornamental edible plants offers both decorative and functional benefits. This approach not only enhances the visual appeal of urban spaces but also contributes to food production, promoting sustainable and health-conscious living environments. Overall, the scientific exploration of ornamental plants with edible flowers underscores their multifaceted value, encompassing nutritional benefits, innovative cultivation techniques, and contributions to sustainable horticultural practices.

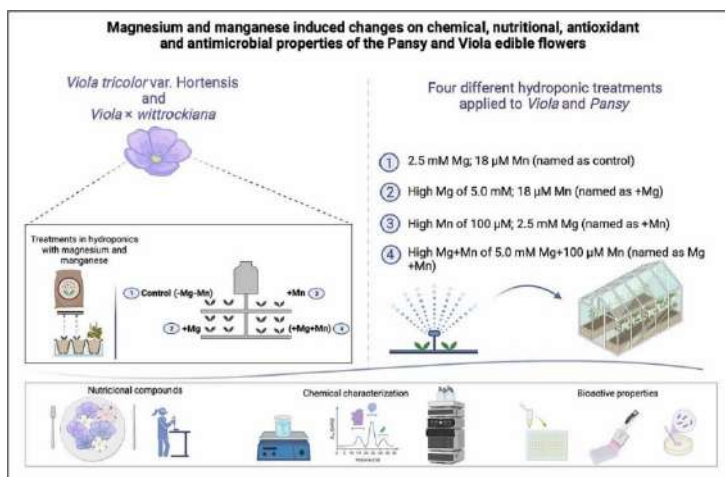


Fig 2. Magnesium and manganese induced changes on chemical, nutritional, antioxidant and antimicrobial properties of the pansy and viola edible flowers.

Research on Biological Properties of Plant Extracts, Essential Oils and Natural Products

Plant extracts and essential oils have been used for medicinal purposes since ancient times. Medicinal and aromatic plants (MAPs) are composed of various phytochemical and nutritive compounds with strong biological properties, including antioxidant, antimicrobial, and cytotoxic effects. These activities are often related to the synergistic effects of compounds other than the predominant molecule. Exploitation of endemic to Cyprus species is one of the group's main research areas. The last 4 years we are working, together with colleagues from CUT (groups of Assoc. Prof. Nikolaos Tzortzakis and Dr. Panagiota Miltiadous) and colleagues from other institutes on the complete characterization of *Sideritis cypria*, an endemic and endangered species, that may give a boost to the national MAP sector, promoting new species with high pharmacological interest in green medicine production using their natural components.

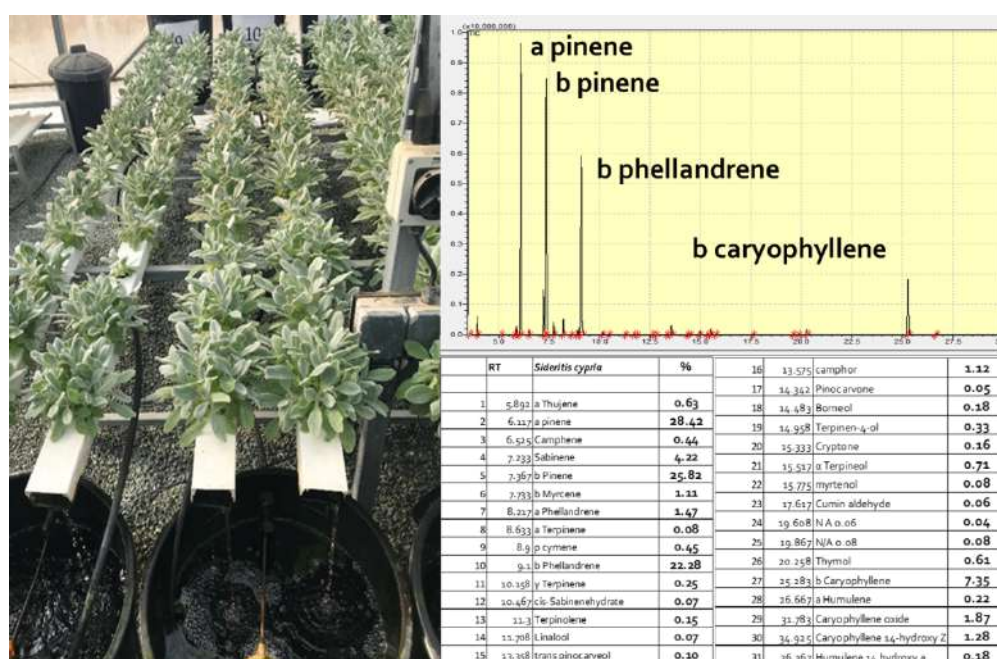


Fig. 3. *Sideritis cypria* plants grown in hydroponics, a complete chromatogram of the analysis of the essential oil and the list of the corresponding identified compounds.

The head of the newly established group has built an extensive global network of collaborators across Greece, Italy, France, the United Arab Emirates, Austria, Portugal and Serbia, has participated in Organizing/Scientific Committees in major scientific events including International Conferences, Workshops and Training Schools, serves as an associate editor for several scientific journals (Heliyon Plant Biology, Frontiers in Plant Sciences, Agronomy, Discover Applied Sciences, Phytion), and has been ranked among the TOP 2% of researchers globally, for 2021, 2022 and 2023, as recognized by Stanford University.

Selected publications

Chrysargyris A, Petrovic JD, Tomou E-M, Kyriakou K, Xylia P, Kotsoni A, Gkretsi V, Miltiadous P, Skaltsa H, Sokovic MD, Tzortzakis N. 2024. Phytochemical Profiles and Biological Activities of Plant Extracts from Aromatic Plants Cultivated in Cyprus. *Biology*, 13, 45.

Chrysargyris, A. 2024. It Runs in the Family: The Importance of the Lamiaceae Family Species. *Agronomy*, 14, 1274.

de Oliveira I, Chrysargyris A, Finimundy TC, Carocho M, Santos-Buelga C, Calhelha RC, Tzortzakis N, Barros L, Heleno SA, 2024. The influence of magnesium and manganese cations on the chemical and bioactive properties of purple and green basil. *Food and Function*, 15 (12).

de Oliveira I, Chrysargyris A, Finimundy TC, Carocho M, Santos-Buelga C, Calhelha RC, Tzortzakis N, Barros L, Heleno SA. 2024. Magnesium and manganese induced changes on chemical, nutritional, antioxidant and antimicrobial properties of the Pansy and Viola edible flowers. *Food Chemistry*, 7,101362.

Chrysargyris A, Tomou E-M, Goula K, Dimakopoulou K, Tzortzakis N, Skaltsa H. 2023. *Sideritis* L. essential oils: A systematic review. *Phytochemistry*, 209(43), 113607.

Chrysargyris A, Baldi A, Lenzi A, Bulgari R. 2023. Wild Plant Species as Potential Horticultural Crops: An Opportunity for Farmers and Consumers. *Horticulturae*, 9, 1193.

Chrysargyris A, Skaltsa H, Konstantopoulou M, 2022. Editorial: Medicinal and Aromatic Plants (MAPs): The connection between cultivation practices and biological properties. *Agronomy*, 12(12), 3108.

Research Area: Food Science and Technology

Atalanti Christou, Special Teaching Staff (*hired in 2025)

Current research areas focused on Food Science and Technology:

- Development, validation, and application of advanced separation methods for the qualitative and quantitative determination of primary and secondary metabolites in foods.
- Optimization of extraction and sample pre-treatment processes for analytical and preparative purposes.
- Application of chemometric techniques for authentication and geographical origin traceability of food and natural products.
- Evaluation of the bioactivity of foods of plant origin and natural products.
- Valorization of agri-food residues/wastes for the development of high-value products.
- Assessment of the impact of food processing technologies on composition and quality attributes.

For the separation, identification, and quantification of various analytes in food and other sample matrices, chromatographic (HPLC-DAD, HPLC-MS) and electrophoretic (CE-DAD, EKC-DAD) analytical techniques were developed and validated based on key evaluation criteria. Additionally, significant attention was given to the development of analytical methods for the enantioselective separation of optically active molecules, using chiral selectors (cyclodextrins, cyclofructans, ionic liquids, etc.) either in the stationary phase or as additives in the mobile phase. Since different enantiomers of a given compound can exhibit distinct biological activities, their chiral analysis is crucial to determine the safety, quality, and bioactivity of foods and other products.

The extraction process is a critical step within the analytical workflow, significantly influencing the subsequent identification and quantification of target analytes. Conventional and alternative extraction techniques (ultrasound-assisted extraction, microwave-assisted extraction, etc.) were employed to isolate target analytes. Considerable attention was devoted to developing cost-effective and environmentally sustainable extraction methodologies, utilizing innovative, non-toxic, and eco-friendly solvents. Among the green solvents studied, natural deep eutectic solvents and aqueous solutions of cyclodextrins and cyclofructans were explored. Advanced statistical techniques, including the development of empirical models (response surface methodology) and machine learning techniques (artificial neural networks), were applied to identify the optimal extraction conditions.

Nowadays, the vast amount of data generated through the application of state-of-the-art analytical methods necessitates using chemometric tools to effectively extract the most meaningful chemical information. Significant attention was directed toward the application of both unsupervised and supervised chemometric approaches for the authentication and traceability of the identity, geographical, and botanical origins of plant-based foods and natural products. By utilizing the chemical composition of the products as a distinguishing marker, sample classification and discrimination were achieved based on processing methods and production conditions.

In addition, particular focus was placed on investigating the polyphenolic composition and bioactivity of plant-based foods and natural products. This category of analytes has attracted great interest due to their wide range of biological and health-promoting effects. The bioactivity of the extracts was assessed through the *in-vitro* evaluation of their antioxidant capacities and anticancer properties. Moreover, attention was focused on identifying novel antimicrobial agents through the evaluation of the bactericidal activity of plant extracts. Furthermore, novel antidiabetic agents were discovered by assessing the inhibitory activity of extracts and pure components against diabetes-related enzymes.

To mitigate the environmental and economic impacts of agricultural and food industry waste, emphasis was placed on developing green processes that utilize these by-products as abundant, renewable, and low-cost sources of bioactive substances. Converting biomass into innovative, value-added products, rather than disposing of it unnecessarily, presents an attractive opportunity to promote sustainability and resource efficiency. Under this framework, the by-products of taro cultivation (taro leaves) and the carob processing industry (carob pulp) were investigated for the preparation of readily available natural antioxidants. Additionally, as part of the strategic development of next-generation sunscreens with broad-spectrum protection, Commandaria grape pomace was utilized as a source of natural photoprotective substances. Building on these sustainability-driven initiatives, an ongoing project is focused on fabricating an edible film composed of natural biopolymeric macromolecules and enriched with anthocyanin extracts, serving as active and intelligent agents for real-time monitoring of food spoilage and shelf-life extension. This study explores Cypriot native plants and agri-food waste as readily available and cost-effective sources of anthocyanins, contributing to flora biodiversity exploitation and waste valorization.

Although food processing plays a crucial role in food preservation, improving safety, and maintaining quality, it may also have detrimental effects on the nutritional quality of the final product. The effects of both traditional food processing methods (milling, cooling/freezing, smoking, heating, drying) and novel emerging technologies (ultrasound and microwave treatment), on the stability of biologically active metabolites in foods will be investigated. As microwave heating and ultrasonic waves are among the simplest, most inexpensive, and most valuable tools in food science and technology, their effects on the stability of food components and the quality of the final product will be extensively studied. The mechanisms of sonochemical and microwave degradation will be thoroughly investigated under various treatment conditions.



Figure 1. The six key research pillars in food science and technology.

Selected publications:

1. Venianakis, T., Parisis, N., Christou, A., Goulas, V., Nikoloudakis, N., Botsaris, G., ... & Gerothanassis, I. P. (2024). Phytochemical Analysis and Biological Evaluation of Carob Leaf (*Ceratonia siliqua* L.) Crude Extracts Using NMR and Mass Spectroscopic Techniques. *Molecules*, 29(22), 5273.
2. Christou, A., Parisis, N. A., Tzakos, A. G., Gerothanassis, I. P., & Goulas, V. (2024). Optimization of β -cyclodextrin based ultrasound-assisted extraction: A green strategy to enhance the extraction of bioactive compounds from taro leaf byproduct. *Sustainable Chemistry and Pharmacy*, 41, 101728.
3. Christou, A., Stavrou, C., Michael, C., Botsaris, G., & Goulas, V. (2024). New Insights into the potential inhibitory effects of native plants from Cyprus on pathogenic bacteria and diabetes-related enzymes. *Microbiology Research*, 15(2), 926-942.
4. Christou, A., Stavrou, K., Michael, C., Botsaris, G., & Goulas, V. (2024). Evaluation of Mediterranean Tree Leaves as Valuable Biomass of Digestive Enzymes and Bacterial Inhibitors in the Concept of Circular Bioeconomy. *Biomass*, 4(2), 442-454.
5. Christou, A., Parisis, N. A., Venianakis, T., Barbouti, A., Tzakos, A. G., Gerothanassis, I. P., & Goulas, V. (2023). Ultrasound-assisted extraction of taro leaf antioxidants using natural deep eutectic solvents: An eco-friendly strategy for the valorization of crop residues. *Antioxidants*, 12(10), 1801.

Research at the Faculty

II. Department Department of Chemical Engineering

Overview

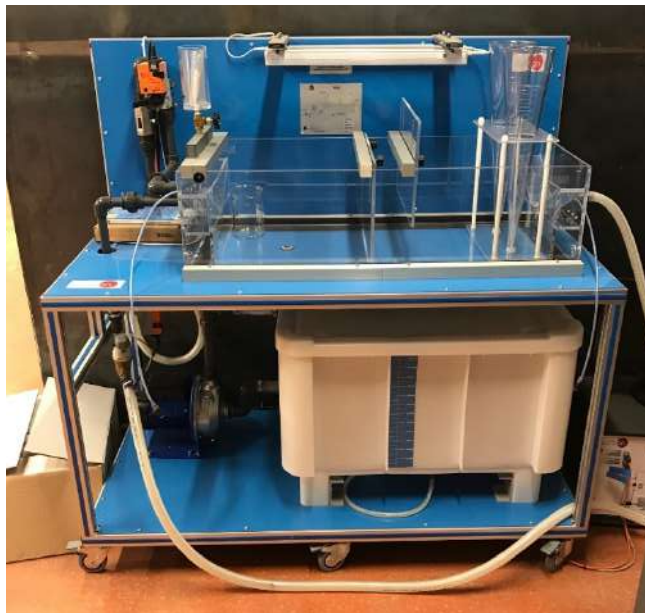
One of the main missions of the EST Department so far has been to promote basic and applied research in the field of Environmental Sciences and Technology, and to facilitate the mobility of its students, researchers and academics through international research cooperation. Having started offering the B.Sc. Programme in Chemical Engineering in collaboration with the University's Faculty of Engineering and Technology, the Department is gradually evolving into a Chemical Engineering Department, recruiting new academic faculty members who specialise in fields of Chemical Engineering, so that by the end of 2019 half of the academic staff is expected to consist of Chemical Engineers.

Despite the small size of the Department and the considerable teaching and administrative workload faced by all academic staff members, EST's collective research output has been very substantial and internationally recognised. The very satisfactory research performance has been acknowledged by the international committee of renowned academics who conducted an external evaluation of the Department in December 2014. In its concluding statement of their evaluation report that was submitted to the University's Rector, the Committee wrote that the University 'should be proud' of the EST Department in view of its research achievements and prospects.

The Department's laboratories possess state-of-the-art equipment such as:

- | | |
|---|---|
| 1. Atomic Absorption Spectrophotometer (AAS) | 18. Fully automated and computerized gas and liquid flow panels |
| 2. Inductively Coupled Plasma – Mass Spectrometer (ICP-MS) | 19. Low and High temp ovens |
| 3. Ion Chromatograph (IC) | 20. Incubators |
| 4. High Performance Liquid Chromatograph (HPLC) | 21. Portable gas analysers (NO _x , CO/CO ₂ , VOCs, Microbial load, H ₂ S, NH ₃ , O ₃ , CH ₄) |
| 5. Gas Chromatograph – Mass Spectrometer (GC-MS) | 22. IR and thermal cameras |
| 6. Surface and Pore Analyser (BET) | 23. Fast Cameras |
| 7. Fourier Transform Infrared Spectrophotometer (FTIR) coupled with DRIFTS Cell | 24. Centrifuges |
| 8. TOC/TON analyser | 25. Sound meters |
| 9. Gas Chromatograph (GC) | 26. pH meters |
| 10. Fermentors | 27. Vortexes |
| 11. Ultraviolet-Visible Spectrophotometers | 28. RO water |
| 12. Microscopes | 29. Water distillation system |
| 13. Fluorescence Spectrophotometer | 30. Conductivity meters |
| 14. Fats, Oils and Grease (FOG) portable analyser | 31. Soil sampling equipment |
| 15. Gas emissions analyser | 32. Refrigerators and freezers |
| 16. Material Printer | 33. Equipment for educational laboratories in Physics |
| 17. Freeze dryer | 34. Computer controlled gaseous mass transfer and diffusion coefficient unit |
| | 35. Computer controlled fixed bed adsorption unit |

- 36. Computer controlled chemical reactors (Batch, Continuous Stirred Tank, Plug-Flow and Fixed Bed reactors)
- 37. Computer controlled catalytic reactor
- 38. Corrosion study unit
- 39. Computer controlled sedimentation tank
- 40. Computer controlled continuous distillation unit
- 41. UV/Vis and FTIR spectroelectrochemical cells for REDOX active samples
- 42. Calorimeter set for thermodynamic experiments



The following pages describe in more detail the major activities carried out during 2016-2018 in the Department's research groups and laboratories. Interested readers may obtain more information by accessing the webpages of each group, or the general webpage of the Department: www.cut.ac.cy/est



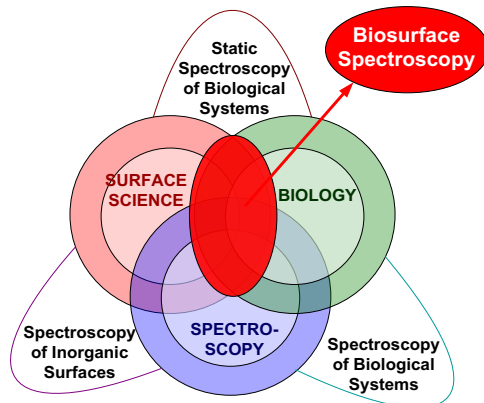


Research Group on Environmental Biocatalysis and Biotechnology (LEBB)

Head: Constantinos Varotsis, Professor

Research projects

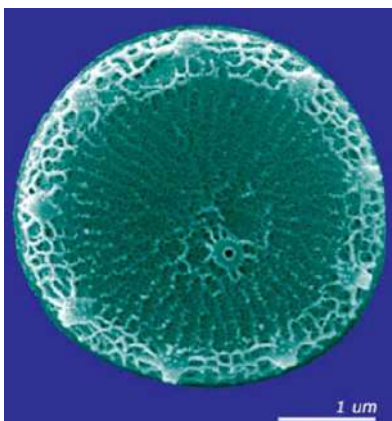
Biosurface spectroscopy



New research field: the red area in the center indicates the field of biosurface spectroscopy at the intersection of three established fields of research.

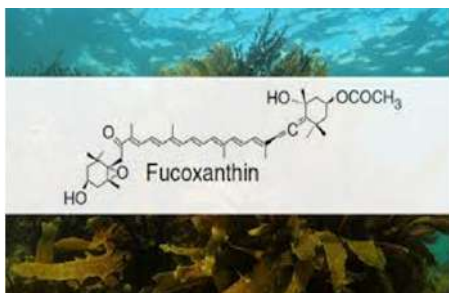
Research interests

Marine Diatoms



Thalassiosira pseudonana is a marine centric diatom. Diatoms are unicellular, eukaryotic, phytoplankton that display a unique evolutionary history and provide major ecological contributions in marine environments. Having evolved 91.5 million years ago during the Upper Turonian period, analyses of these organisms display long-term contributions to deposits of diatomite, carbon cycling, global climate, and petroleum reserves. Today diatoms continue to have major ecological implications by playing a fundamental role in global carbon cycling and global climate. Growth under different light conditions – Characterization and Function of a number of Marine diatoms are investigated in our laboratory.

Biotechnology of Marine Anoxygenic Phototrophic bacteria and Diatoms

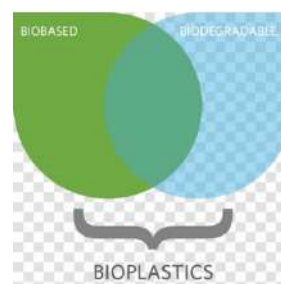


Roseobacter clade represents one of the most abundant, metabolically versatile and ecologically important bacterial groups found in marine habitats. A detailed molecular investigation of the regulatory and metabolic networks of these organisms is currently limited for many strains by missing suitable genetic tools. Scientific interest in this bacterial group increased steadily since the description of its first representatives *Roseobacter denitrificans* and *Roseobacter litoralis*. Marine habitats represent a

prolific source for molecules of biotechnological interest. In particular, marine bacteria have attracted attention and were successfully exploited for industrial applications. The newly established Marine *Roseobacter* lineage consists of several bacterial species which possess the capacity to produce biomolecules of biotechnological interest. Growth/Isolation /Characterization and Function of a number of Marine Anoxygenic Phototrophic bacteria by a variety of Advanced Analytical-Spectroscopic techniques.

Biodegradation of bio-plastics in the marine environment

The biodegradability of bioplastics is highly affected by their physical and chemical structure. We have initiated research on the biodegradation of compostable-starch bioplastic and oxo biodegradable plastics present in the marine environment by *Sulfobacter Mediterraneus* and *Sagittula Stellata* (Lignin-biodegradation) by laser induced Breakdown spectroscopy and Raman spectroscopy. The Alterations of Biofilm Formation and extracellular polymeric substances (EPSs) on the surfaces of bio-plastics is investigated by FTIR mapping techniques.



Structure and function of proteins

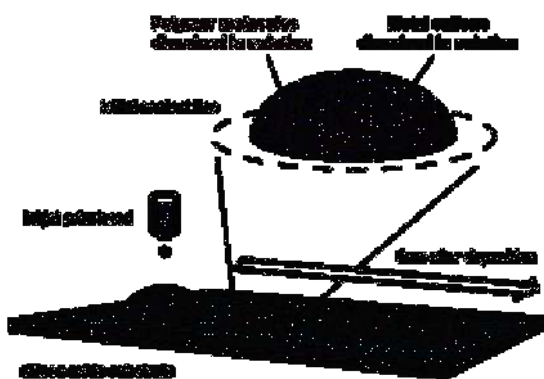
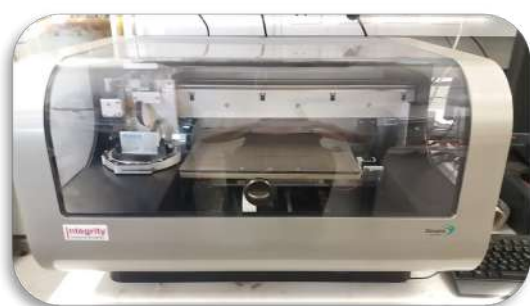
Electron transfer coupled to proton translocation is the basic mechanism of energy generation in most living organisms, but the molecular mechanism is not understood. A key enzyme in all eukaryotic and most prokaryotic electron transfer systems is cytochrome *c* oxidase, which accepts electrons derived from food and donates them to oxygen, generating a pH and electrical gradient to drive ATP synthesis. We are studying the bacterial cytochrome *c* oxidases *ba*₃ from *Thermus thermophilus* which differ in peptide composition from the mammalian cytochrome *c* oxidase but carry out the reduction of Oxygen (O₂) to water (H₂O), the oxidation of carbon monoxide (CO) to carbon dioxide (CO₂) and the reduction of Nitric oxide (NO) to laughing gas (N₂O) by using the same metal centers to catalyze the process.

Teaching: CEN 204 (Applied Thermodynamics), CEN 304 Physical Chemistry II. Graduate: CEN 702 Advanced Biotechnology and Biocatalysis.

Group on Environmental catalysis

Head: Costas N. Costa, Professor

Environmental catalysis has continuously grown in importance over the last 2 decades not only in terms of the worldwide catalyst market, but also as a driver of advances in the whole area of catalysis. The development of innovative “environmental” catalysts is also the crucial factor towards the objective of developing a new sustainable industrial chemistry. In the last decade, considerable expansion of the traditional area of environmental catalysis (mainly NO_x removal from stationary and mobile sources, and VOC conversion) has also occurred. The research group of the Environmental Catalysis Lab has extensive research experience in both traditional as well as new areas of environmental catalysis such as: (i) catalytic technologies for liquid or solid waste reduction or purification, (ii) catalysis for greenhouse gas control, (iii) use of catalysts for user-friendly technologies and reduction of indoor pollution, and (iv) reduction of the environmental impact of transport.



Specialized ink-jet printer for catalytic materials printing (top) and schematic representation of the printing process (bottom).

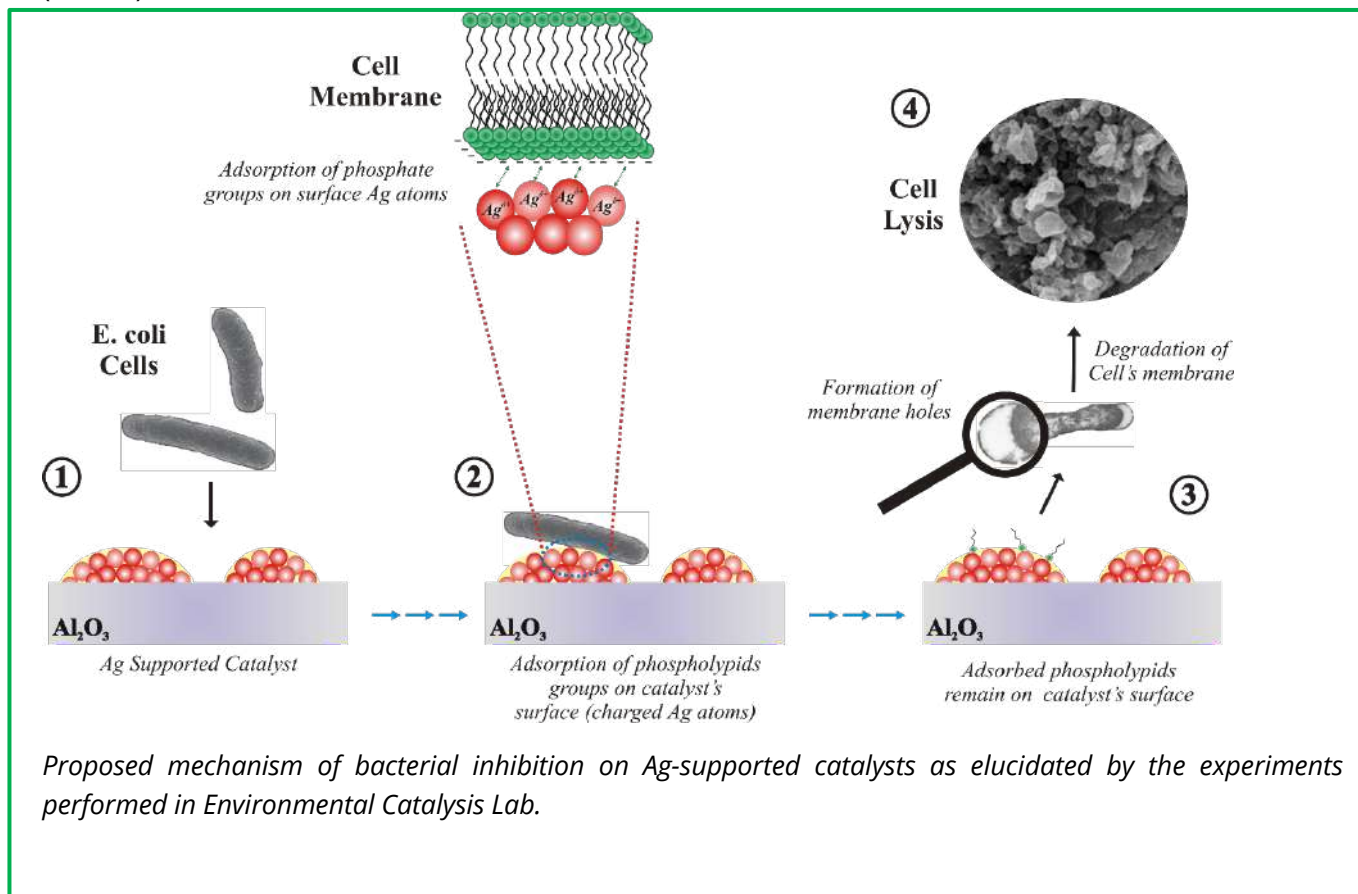
Among others, our group is currently investigating novel methods for catalysts development through “Printing”. “Catalysts Printing”, is a modern method that may be used for the accurate manipulation and tuning of the properties of catalytic materials.

Very recently, our pioneer research on the bactericidal properties of silver supported catalysts led to some very important findings that may trigger a whole new sector, that of antimicrobial catalysis.

In particular, our work concerns catalytic, kinetic, characterization and mechanistic studies, including the application of novel transient (TPD, TPSR, TPO and TPH) and isotopic techniques (SSITKA) for the elucidation of the mechanism of catalytic reactions (at a molecular level), utilizing the cutting-edge instrumentation that is available at the Lab of Environmental Catalysis.

The Lab of Environmental Catalysis participates in numerous EU-funded and national research projects since its foundation. The lab has been able to attract more than 3 million euro of external funding during the 8 years of its operation. Are senior lab staff are members of international associations and networks such as the European Federation of Catalysis Societies (EFCATS), the International Water Association (IWA),

the International Solid Waste Association (ISWA) and Waste-to-Energy Research and Technology Council (WERT).



Our network of academic collaborators extends globally, including partners (universities and research institutes) from Spain, Italy, France, Greece, UK, Germany, Slovenia, Latvia, Russia, Israel, Jordan and the USA. In addition, our network of cooperation includes a large number of industrial collaborators such as Linde Engineering AG (Germany-License Agreement), Wartzila (Finland – Research Cooperation), Heraeus Holding GmbH (Germany-License Agreement) and Ricardo Engineering (UK - Research Cooperation).

Selected Publications

1. Theofilou S.P., Antoniou C., Potamiti L., Hadjisavvas A., Panayiotidis M., Savva P.G., Costa C.N., Fotopoulos V., "Immobilized Ag-nanoparticles (iNPs) for environmental applications: Elucidation of immobilized silver-induced inhibition mechanism of Escherichia coli", Journal of Environmental Chemical Engineering 9 (5), 2021, 106001.
2. Vasiliki K. Chatziiona, Barbara K. Constantinou, Petros G. Savva, Georgios G. Olympiou, Konstantinos Kapnisis, Andreas Anayiotos, Costas N. Costa*, "Regulating the Catalytic Properties of Pt/ Al_2O_3 through Nanoscale Inkjet Printing", Catalysis Communications, Catalysis Communications 103 (2018) 69–73.
3. Christodoulos P. Theologides, Georgios G. Olympiou, Petros G. Savva, Konstantinos Kapnisis, Andreas Anayiotos, Costas N. Costa*, "Mechanistic Aspects (SSITKA-DRIFTS) of the Catalytic Denitrification of Water with Hydrogen on Pd-Cu Supported Catalysts", Applied Catalysis B: Environmental, 205, 2017, 443-454.

4. C. P. Theologides, S. P. Theofilou, A. Anayiotos and C. N. Costa*, "Preventing maritime transport of pathogens: the remarkable antimicrobial properties of Ag supported catalysts for ships ballast water disinfection", *Water Science & Technology* 76 (3), 2017, 712-718.
5. Babatsouli, Panagiota; Palogos, Ioannis; Michalodimitraki, Eleni; Costa, Costas; Kalogerakis, Nicolas, "Evaluation of a MBR Pilot Treating Industrial Wastewater with a High COD/N Ratio", *Journal of Chemical Technology and Biotechnology*, 90(1), 2015, 26-33.
6. C.P. Theologides, G.G. Olympiou, P.G. Savva, N.A. Pantelidou, B.K. Constantinou, V.K. Chatziiona, L.Y. Valanidou, C.T. Piskopianou and C.N. Costa*, "Novel Catalytic and Mechanistic Studies on Wastewater Denitrification with Hydrogen", *Water Science and Technology*, 69(3), 2014, 680-686.
7. P.G. Savva and C.N. Costa*, "Hydrogen Lean DeNO_x as an Alternative to the Ammonia and Hydrocarbon Selective Catalytic Reduction (SCR)", *Catalysis Reviews*, 53/2, 2011, 91.
8. L. Valanidou and C.N. Costa*, "A Highly Active, Selective and Stable Ag/Mg-Ce-Al-O Catalyst for the NO/C₂H₅OH/O₂ Reaction", *Appl. Catal. B: Environmental*, 107, 2011, 164-176.
9. Lilian Y. Valanidou, Christodoulos P. Theologides, Georgios G. Olympiou, Petros G. Savva and Costas N. Costa*, "A Novel Catalyst Ag/MgO-CeO₂-Al₂O₃ for the Low-temperature Ethanol-SCR of NO under lean de-NO_x Conditions", *Recent Patents in Catal.*, 1, 2012, 74-84.



Research Group on Sustainable Energy (SEL)

Head: Alexandros G. Charalambides, Associate Professor

Team: Olympia Nisiforou, Ian Cole, Stefani Peratikou, Antigoni Komodiki, Sofia Papadopoulou, Mariza Vryonidi, Eliza Nikolaou, Stavros Stylianou

Webpage: www.energylab.ac.cy and www.climatehub.org.cy

The research work/interests of the Sustainable Energy Laboratory (SEL) lie primarily in three main areas: (a) developing cleantech ecosystems and promoting entrepreneurship, (b) predicting energy production from solar systems and (c) promoting the use of renewable energy and energy saving. Over the past five years, the staff of SEL has successfully completed/currently running 30+ research and consulting projects (from EU, national and private funding sources), resulting in more than €3,000,000 in funding and a plethora of publications.

Solar Energy Predictions

One of the major problems of meteorological forecasts, is the low temporal and spatial resolution of solar irradiance forecasts, which are unable to estimate the sudden fluctuations of irradiance over a specific relatively small area, caused by clouds obscuring the sun. So far, traditional approaches regarding forecasting of the state of the sky or incident solar irradiance have been developed using either meteorological data from satellite imagery or specialised equipment. The use of meteorological data cannot give the desired results as it would be required to use real time images from geostationary satellites to cover a specific area. Apart from the high cost of the data, satellite images have very low temporal (~30 min) and temporal (1km²) resolution which are inadequate for accurate forecasting. Alternatively, incident solar irradiance and cloud/dust motion measurements could be forecasted using accurate specialised equipment such as a grid of ground based cameras or irradiance sensors to record the state

of the sky. Contrary to existing methodologies, SEL is working on a novel, innovative approach in nowcasting the state of the sky and incident solar irradiance using data from the metering systems of grid connected PVs, without the necessity of using additional equipment. A dense network of PVs providing continuous data will enable very high temporal and spatial resolution of forecasts. However, due to the nature of clouds, the nowcasting horizon will be intra hour (1-60 minutes).

Green Entrepreneurship

Since 2008, Europe has been suffering the effects of the economic crisis and entrepreneurship has been set as a no.1 priority by the European Council, as it seems to be the only way to deal with high unemployment rates of young people. To this regard, the EC has developed the Entrepreneurship 2020 Action Plan, and in 2008 has created the European Institute of Innovation and Technology (EIT). SEL staff have been working closely with EIT Climate-KIC, one of the bodies funded by EIT, on (a) developing innovative entrepreneurship programmes for PhD STEM (Science, Technology, Engineering and Mathematics) students/graduates and entrepreneurs, (b) on analyzing existing entrepreneurship programmes, accelerators, science /technological hubs and incubators in the EU and beyond and (c) on identifying existing gap in South EU countries and the best practices from North EU countries.

Selected projects

1. Quick Challenge-driven, Human-centered Co-Creation mechanism for INDUSty-Academia Collaborations (INSUSAC), 2022-2025, Horizon Europe (€114,100)
2. Mediterranean Island Cleantech Innovation Ecosystem (MICIE), 2022-2023, Horizon 2020 (€482,000)
3. Climate Resilient-Regions through Systemic Solutions and Innovations (ARSINOE), 2021-2025, Horizon 2020 (€321,500)
4. Towards innovative methods for energy performance assessment and certification of buildings (TIMEPAC), 2022-2024, Horizon 2020 (€22,727.50)
5. Climate Risk Information for SupportIngADaptation Planning and operaTion- Phase II (CRISI-ADAPT II), 2019-2022, EIT Climate-KIC (€150,738)
6. Intra-hour prediction of solar electricity generation from Photovoltaics, 2018-2020, Solar-ERA.net (€168,000)
7. A knowledge Alliance in Eco-Innovation Entrepreneurship to Boost SMEs Competitiveness, 2017-2020, Interreg (€101,150.50)

Selected publications

1. Peratikou, S. and Charalambides, A.G., 2022, "*Estimating Clear-Sky PV Electricity Production Without Exogenous Data*", *Solar Energy Advances*, Vol. 2, (<https://doi.org/10.1016/j.seja.2022.100015>).
2. Nisoforou, O., Shakou, L.M., Magou, A. and Charalambides, A.G., 2022, "A Roadmap towards the Decarbonization of Shipping: A Participatory Approach in Cyprus", *Sustainability*, Vol. 14, (<https://doi.org/10.3390/su14042185>).
3. Kyprianidou, I., Worrell, E. and Charalambides, A.G., 2021 "The cost-effectiveness of CO2 mitigation measures for the decarbonisation of shipping. The case study of a globally operating ship-management company", *Journal of Cleaner Production*, Vol. 316, (<https://doi.org/10.1016/j.jclepro.2021.128094>).
4. Konstantinou, M., Peratikou, S. and Charalambides, A.G., 2021, "Solar Photovoltaic Forecasting of Power Output Using LSTM Networks", *Atmosphere*, Vol. 12, No. 124 (<https://doi.org/10.3390/atmos12010124>)
5. Geissler, S, Charalambides, A.G. and Hanratty, M., 2019, "Public Access to Building Related Energy Data for Better Decision Making in Implementing Energy Efficiency Strategies: Legal Barriers and Technical Challenges", *Energies*, Vol 12 (<https://doi.org/10.3390/en12102029>).



Research Group on Environmental Bioprocessing

Head: Michalis Koutinas, Associate Professor

Team: Dr. Maria Patsalou, Dr. Evdokia Syranidou, Dr. Andonia Nicodemou, Panayiota Karanicola, Marianna Christodoulou, Fryni Pyrilli, Rena Konstantinou, Afroditi Kyriazi, Nikos Athanasiades, Andri Michailidou

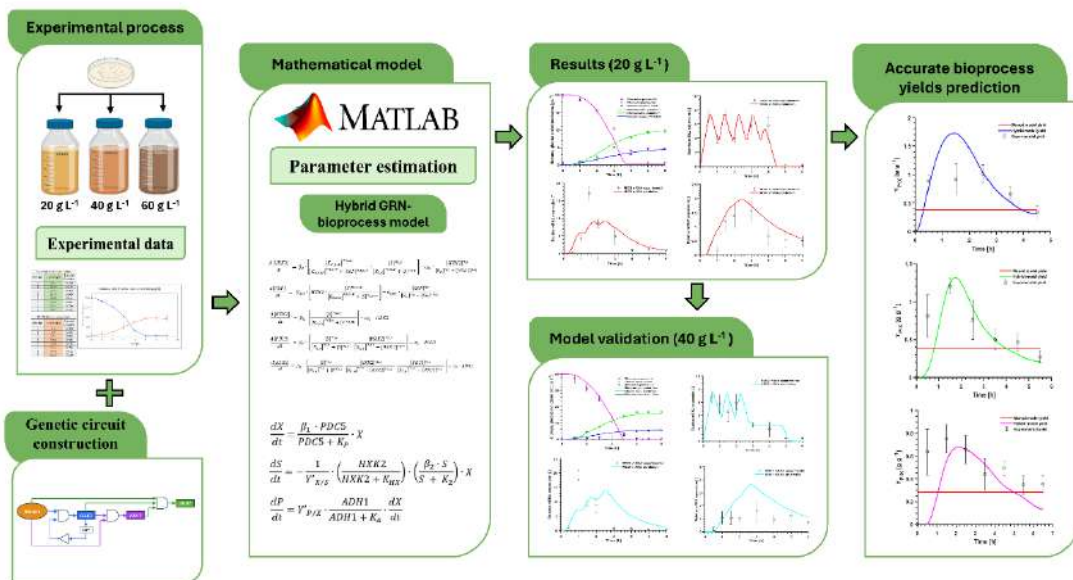
Webpage: <https://enblab.weebly.com/>

Petrochemical processes have provided low cost production routes for fuels, plastics, and chemicals for over 50 years. Nevertheless, the escalating impact on the environment and the inevitable depletion of fossil feedstocks make it essential that benign, sustainable alternatives be developed commercially in a cost-effective and expedited manner. Biomass-based industrial waste streams could be regarded as sustainable feedstocks for the development of a new industrial sector that integrates chemical and material production into existing industries.

Our group applies advanced experimental and systems engineering techniques in order to provide solutions to important biological problems. Our interests are in line with EU priorities for waste and natural resources, focusing on the following areas:

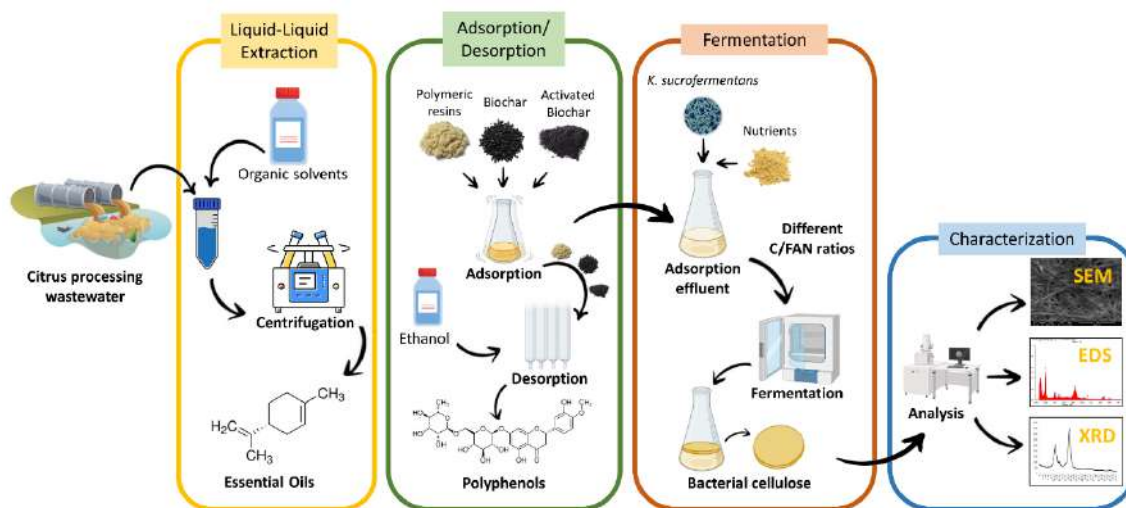
1. Biotechnological applications for the production of added-value chemicals, biomaterials and biofuels from waste;
2. Application of biological systems for the treatment of toxic and persistent pollutants from aqueous, gaseous and solid waste streams;
3. Development of mathematical models for understanding specific metabolic properties of the strains employed and the function of the bioprocess applied;
4. Utilisation of advanced molecular techniques for detecting specific microbial strains used in applied bioprocesses and quantification of important metabolic properties;

We participate in several national and EU-funded research projects and as members of international associations and networks. We have been appointed as Country Representatives of the International Bioprocessing Association (IBA-IFIBiop) and Management Committee members of COST Action CA20133 "Cross-Border Transfer and Development of Sustainable Resource Recovery Strategies Towards Zero Waste (FULLRECO4US)".



Linking gene regulation to ethanol bioprocess kinetics.

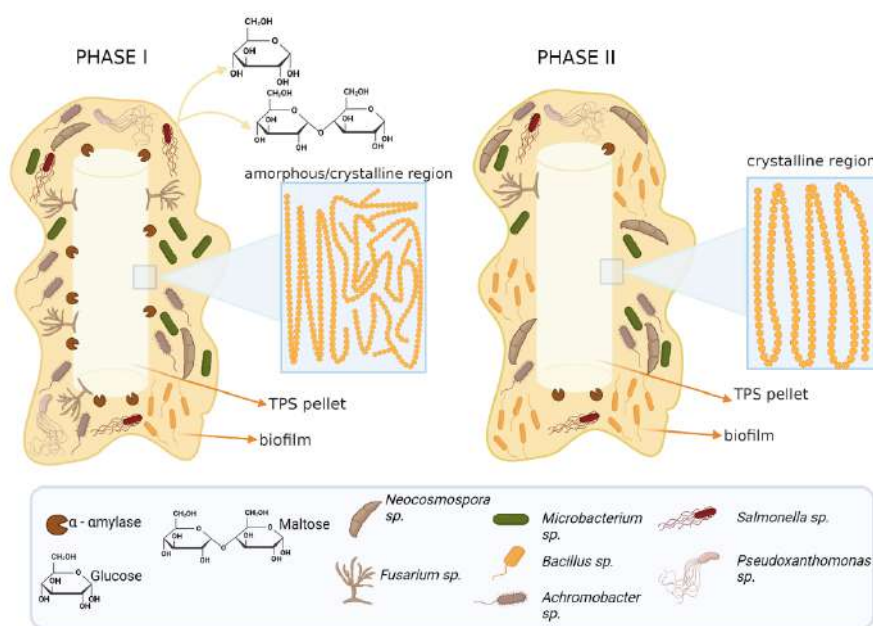
Current research at the Environmental Bioprocessing Lab is evaluating the potential for development of gene regulation models aiming to capture essential molecular dynamics and use these effectively for the prediction of bioprocess reaction kinetics. We are currently exemplifying this idea via the development of a dynamic mathematical model describing hexose sensing, signaling and bioconversion in *S. cerevisiae* employed for bioethanol production.



Optimization of a citrus wastewater-based biorefinery for production of multiple commodities.

In the broader field of Industrial Biotechnology, over the last 3 years we have participated in a LIFE+ project demonstrating a novel technology for the production of biofertilizer from municipal biowaste (LIFE EBP), a national project concerned with the production of multiple marketable commodities from citrus processing waste (BioTECPro), as well as H2020 and national projects towards the development of bioprocessing routes for bioplastics recycling (Sus-Bio-Plastics, MICROFIBRES). Moreover, two PhD Thesis

have been completed concerned with the development of biochar-based biocatalysts and algal biorefineries.



Biodegradation of thermoplastic starch by a newly isolated active microbial community.

Selected publications

Karanicola P, Patsalou M, ... Constantinides G, Koutinas M. 2025. Advanced manufacture of polyphenols, essential oils and bacterial cellulose in a novel citrus processing wastewater biorefinery. *Journal of Environmental Management*, 374:124106.

Patsalou M, Konstantinou R, ... Constantinides G, Koutinas M. 2024. Starch hydrolysis using immobilized cells and enzymes of two *Aspergillus* strains on oxidized carbonaceous materials. *Industrial Crops & Products*, 222:120069.

Syranidou E, Pyrilli F, ... Kalogerakis N, Koutinas M. 2024. Biodegradation of thermoplastic starch by a newly isolated active microbial community: Deciphering the biochemical mechanisms controlling bioprocess robustness. *Chemical Engineering Journal*, 499:155957.

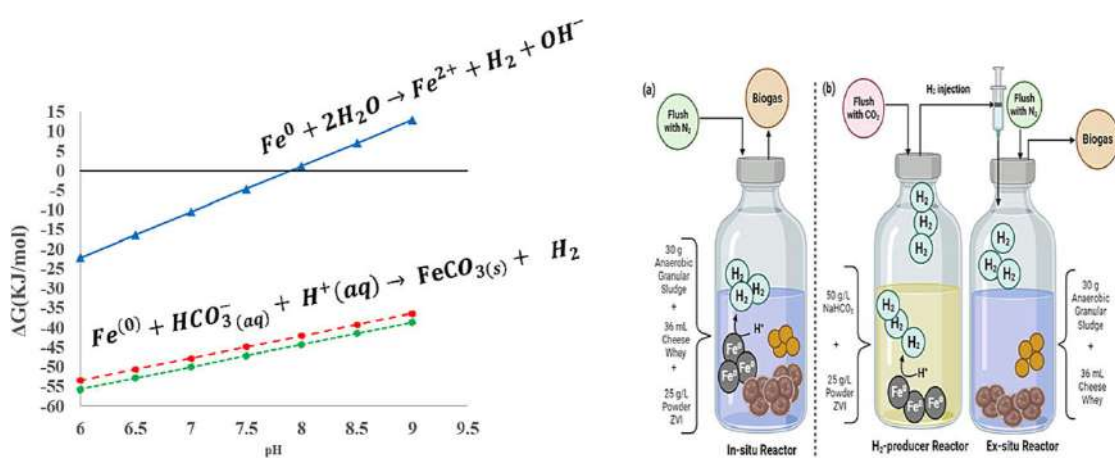


Research Group on Environmental Engineering

Head: Ioannis Vyrides, Associate Professor

Webpage: <https://www.cut.ac.cy/faculties/gem/est/staff/ioannis.vyrides/>

The Environmental Engineering Laboratory, headed by Associate Professor Ioannis Vyrides, focuses on anaerobic digestion. Through anaerobic digestion, it is possible to convert organic solid and liquid waste into biogas or volatile fatty acids. The laboratory investigates the mechanisms of anaerobic digestion using microbiological techniques, next-generation sequencing, analytical methods, and controlled experiments aimed at either inhibiting or favorably enhancing specific microbial groups. Additionally, it explores the application of anaerobic digestion under extreme conditions to broaden its range of uses. Microbial thermodynamics is also employed to interpret experimental results.



A major research area of the lab is the use of zero-valent metals, such as iron, under anaerobic conditions. It has been found that in environments with high dissolved carbon dioxide, hydrogen can be produced, and CO₂ can be sequestered into iron.

The laboratory studies the coupling of zero-valent metal reactions with anaerobic digestion, aiming to convert carbon dioxide into methane—a fuel—or into acids, which can serve as raw materials for producing other valuable compounds. The addition of zero-valent metals to anaerobic digestion has been shown to increase process efficiency and enhance biogas upgrading.

Current challenges the lab addresses include applying anaerobic processes in more extreme environments and exploring alternative metal sources, such as scrap metal instead of pure metals. The lab also investigates reducing the size of these metals via ball milling, powered by renewable energy sources. This approach offers the potential for energy storage in the form of iron, which can then be used for CO₂ sequestration and hydrogen production—or, when combined with anaerobic digestion, for the production of methane or acids.

Publications: https://scholar.google.com/scholar?hl=el&as_sdt=0%2C5&q=vyrides&oq=

Participation in research projects:

- 1) January 2024 – December 2026: ClimAte neutRal INitiatives for GrowiNg heAlTh and care Unmet Requirements (Acronym: CARING NATURE). Funded under HORIZON-HLTH-2023-CARE-04, Horizon Research and Innovation Actions.

Dr. Ioannis Vyrides is the Principal Investigator (PI) for the Cyprus University of Technology (CUT).

Project website: <https://caringnature.eu/>

- 2) July 2024 – June 2026: Towards bioCNG as a Carbon Negative Maritime Power Source (Acronym: Net-Zero-Emissions-CI). Funded by the Research and Innovation Foundation of Cyprus (RIF) under the call CODEVELOP-REPowerEU/1223/0096.



Research Group on Water Treatment- AQUA

Head: Maria G. Antoniou, Associate Professor

Team: Nikoletta Tsiarta, Eleni C. Keliri, Nomiki I. Kallikazarou, Efthymia Chatziathanasiou, Despina Kyriazi, Eleni Kolovou, Kyproula Georgiou, and Andreas Hadjicosti

Webpage: <http://WTL-AQUA.weebly.com>

The research activities of the Water Treatment Laboratory-AQUA focus on the application of advanced oxidation treatment processes (AOPs) for the removal of man-made and naturally produced toxic compounds from water and wastewater.



Specifically, WTL-AQUA focuses primarily on monitoring, detecting, preventing, and treating cyanobacterial-contaminated water at its source and in drinking water treatment plants. Cyanobacteria (blue-green algae) are phototrophic microorganisms and an essential part of the phytoplankton community. However, increased nutrient fluxes from anthropogenic activities, including intense agricultural and livestock practices, as well as urbanization, along with climate change, have resulted in an increased frequency and persistence of cyanobacteria harmful blooms (cyano-HABs) on a global scale. Cyano-HABs not only directly affect water quality by producing undesirable colors, tastes, and odors but also by releasing harmful toxic metabolites (cyanotoxins) into the water. Reported LD50 for cyanotoxins can be as low as 50 µg/kg. These compounds are now included in the newly Revised Drinking Water Directive (2020/2184/EC), which means that monitoring and treatment of cyanobacteria and cyanotoxins will become mandatory in surface waters, applying more pressure to local authorities to manage and treat cyano-HAB-contaminated waters adequately and promptly.

Below are summarized select studies performed at WTL-AQUA the past four years.

1. *CYANOTECH: A sustainable and innovative management system for toxic cyanobacteria blooming of surface waters with combined energy production, sustainable agriculture, and food safety*

CYanoTech was a 27-month project (March 2022-May 2024) that proposed a novel, sustainable, and innovative management system for mitigating the effects of toxic cyanobacteria blooming in surface waters. The project had an inherent interdisciplinary nature and addresses issues related to eutrophication, water scarcity, global warming, and climate change that greatly contribute to surface water quality deterioration and availability and force the usage of low-quality water for drinking and irrigation purposes. The CYanoTech system comprises of removal of the excess aquatic biomass (cyanobacteria cells and algae) from water with a low-energy non-mechanical separation technology, the treatment of the aquatic biomass for the production of energy and marketable products (fertilizers), and the application of treated and untreated surface water in hydroponic cultures that produce safe for consumption crops (cyanotoxins-free crops). The energy produced is anticipated to compensate for the total energy needs of the applied treatment processes, further reducing the system's overall carbon footprint and making it self-

sustainable. Life cycle analysis (LCA) was employed to demonstrate the system's sustainability and market viability. The project was led by the Water Treatment Laboratory-Aqua of CUT (Dr. Maria G. Antoniou), while the consortium was comprised of the Hydro-Aromatic Plants group of CUT (Dr. Nikolaos Tzortzakis), the Ionian University in Greece (Dr. Ioannis Fotidis) and the University of Gdansk in Poland (Prof. Hanna Mazur-Marzec). More at <https://cyanotechproject.wordpress.com/> and #cyanotech_project

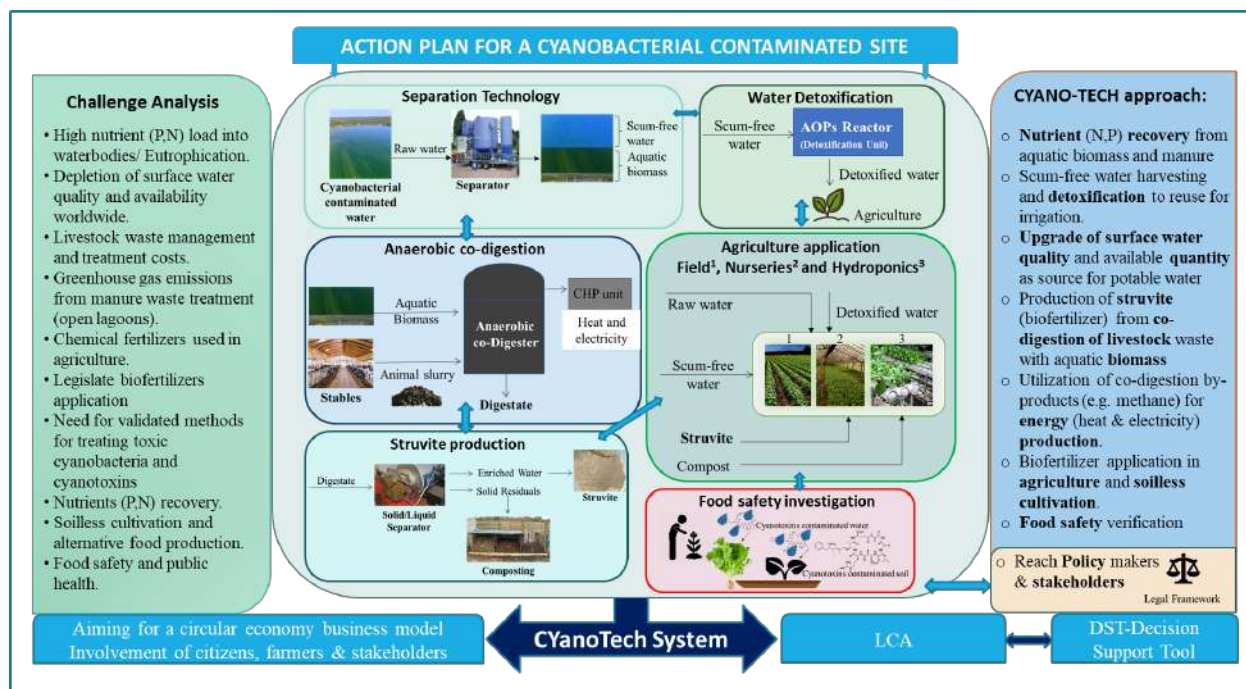


Figure 1. Overview of CyanoTech project

2. Patent submission on the quantification of peroxymonosulfate (PMS)

Peroxide-based chemicals such as the peroxymonosulfate (PMS) have many usages in water and wastewater as well as in the pool and spa industries. PMS specifically is known for performing targeted oxidation for the removal of contaminants of emerging concern (CECs including cyanotoxins) and also has disinfection properties. However, there was no rapid method or commercially available kit for its quantification. The WTL-AQUA group developed her own rapid, affordable colorimetric method which was submitted for a European and a USA patent (PCT Application No. PCT/EP2021/075500 dated 16 September 2021; EP Application No. 21778062.6 dated 16 March 2023; US Non-Provisional Application No. 18/026,738 dated 16 March 2023).

3. Dissemination activities and Erasmus mobilities

Dr Maria Antoniou visited the Department of Biology, Faculty of Sciences Semailia of the Cadi Ayyad University, in Marrakesh, Morocco. Dr. Antoniou was hosted by Prof. Mohammed Loudiki, that along with Prof. Naaila Ouazzani, Prof. Brahim Oudra (Head of Biology Department) they organized a short seminar to present research activities related to monitoring, treatment, and management of toxic cyanobacteria that WTL-AQUA of CUT and the Laboratory of Water, Biodiversity and Climate of UCA are currently engaging in. Since there was a lot of overlap between the two laboratories a Memorandum of Understanding (MoU) was signed between the two institutes. WTL-AQUA initiated the signing of another MoU between CUT and the ICHA University in South Korea. Dr. Antoniou (CUT) and Dr. Changseok Han (ICHA) have been long term collaborators and after visiting each-others labs last year, an MoU was signed on June 2024. Another networking activity organized by WTL-AQUA, was an Erasmus Learning Week with 3rd year students of the Department of Chemical Engineering with the Department of Mining and Civil

Engineering Universidad Politécnica de Cartagena from the 20-27th of March 2023. Among the educational and research activities that the students will engage in, it will be a joint event because of the International Water Day that is celebrated on the 22nd of March. During this event, the activities of the CYanoTech project were communicated to the attendees, and a small-scale DWTP was constructed and is now on display at the Museum of Water and Energy of UPCT. Finally, WTL-AQUA, served as the local organizer for two international conferences SPASEC_27 & AOTs_28 that took place at CUT on the 11-14 June 2024 and participated in the Researcher's Night Event organized by RIF on September 2023 and 2024.



Figure 2. Construction of the DWTP in Cartagena, Spain, March 2023 (left) and participation at the European Researcher Night in Nicosia, September 2024 (right).

Selected publications

Yixin Yan, Nomiki I. Kallikazarou, Olympia Nisiforou, Qingyu Shang, Dafang Fu, Maria G. Antoniou, Ioannis A. Fotidis, Phosphorus recovery through struvite crystallization from real wastewater: Bridging gaps from lab to market. *Bioresource Technology*, Available online 20 March 2025, 132408, <https://doi.org/10.1016/j.biortech.2025.132408>

Giannis Neofytou, Antonios Chrysargyris, Maria G. Antoniou, Nikolaos Tzortzakis. Radish and Spinach Seedling Production and Early Growth in Response to Struvite Use as a Phosphorus Source. *Plants*, 2024, 13 (20), 2917.

Sara Melito, Domenico Ronga, Daniele Marceddu, Nomiki I Kallikazarou, Maria G Antoniou, Vittoria Giannini. Organo-mineral Fertilizer Containing Struvite from Liquid Digestate for Cucurbita pepo L. Seedling Production. *Journal of Soil Science and Plant Nutrition*, 2023, 23(4), 6707-6720

Yixin Yan, Nomiki I. Kallikazarou, Christos Tzenos, Thomas A. Kotsopoulos, Loukas Koutsokeras, Despoina A. Kokkinidou, Christodoulos Michael, Georgios Constantinides, Andreas S. Anayiotos, George Botsaris, Olympia Nisiforou, Maria G. Antoniou, and Ioannis A. Fotidis. Pilot-scale biogas and in-situ struvite production from pig slurry: A novel integrated approach. *Journal of Cleaner Production*, (2023), 431, 139656

Eleni Keliri, Panagiota Adamou, Nektarios Efstathiou, Despoina. Kokkinidou, Konstantinos Kapnisis, Andreas S. Anayiotos, Hanna Mazur-Marzec, and Maria G. Antoniou. Calcium peroxide (CaO₂) granules enclosed in fabrics as an alternative H₂O₂ delivery system to combat *Microcystis* sp. *Chemical Engineering Journal Advances*, 2022, 11, 100318



Research Group on Chemical Reaction Engineering (CREL)

Head: Achilleas Konstantinou, Associate Professor

Team: Eleana Harkou, Panayiota Adamou, Kyproula Georgiou, Antonis Prokopiou, Konstantinos Achillides, Nikol Atanasova, Anastasia Spanou, Savvas Kamenos, Valerio Natale

Webpage: <https://www.cut.ac.cy/faculties/gem/est/staff/a.konstantinou/?languageld=1>

Research work:

My research work over the last 12 years has been in the field of Chemical Reaction Engineering, and primarily in the field of multiphase reactor design. More specifically, my research work is focused on the experimental and theoretical studies of novel multiphase reactors and their characterization in relation to kinetics, hydrodynamics and mass/heat transfer for optimising their performance. I have been working on the design, development and evaluation of several gas/liquid and gas/liquid/solid microstructured continuous flow reactors both experimentally, as well as computationally- validating the experimental results (concentrations, velocity and temperature profiles) using a variety of modelling tools (analytical as well as complex computational fluid dynamics (CFD)), and assessing their suitability for production.

Ongoing research work:

Currently, I have my research group working in the area of Chemical Reaction Engineering, with projects on CO₂ capture for post-combustion gases, liquid fuel synthesis in intensified reactors, biofuels production and process in intensified reactors for biooil upgrading, plastic solid waste treatment using thermal and catalytic pyrolysis and decomposition of formic acid/hydrous hydrazine to hydrogen production. These are either projects I am leading at Cyprus University of Technology (CUT) or multidisciplinary projects in collaboration with leading Universities such as University College London, University of Bologna, University of Milano, Kuwait Institute of Scientific Research and University of Western Macedonia.

Current Research Funding:

- **Sugars:** Optimized in Silico Sour Gas Processing for Offshore Deepwater Gas Technology Applications at the Eastern Mediterranean Region, PhD in INDUSTRY/1222/0123- IDEK (The Research Promotion Foundation Programmes, Cyprus). €150,000 in collaboration with the Cyprus Hydrocarbons Company (CHC). Co-advisement with Associate Professor Pavlo Stephanou. (2023-2026)
- **Bio4MaR:** Development of a Waste Biomass Conversion System that Incorporates Liquefaction and Pyrolysis Technologies for Producing Biochemicals for the Maritime Sector, CODEVELOP-AG-SHHE/0823/0181- IDEK (The Research Promotion Foundation Programmes, Cyprus). €600,000 (2024-2026)
- **Nano-CarbonCapS:** Novel Nano-Enhanced Carbon Capture (CCS) Systems for Industrial Post Combustion Processes, Codevelop-REPowerEU/1223/0118-IDEK, €600,000 (2024-2026)
- **REnew-Bio:** Advancing the energetic performance of upcycled biopolyol production towards the green transition of construction materials via innovative continuous reactor and Industry 4.0 tools, CODEVELOP-REPowerEU/1223/0079-IDEK, €600,000 (2024-2026)

Selected publications:

- (1) Constantinou, A., Hafeez, S., Harkou, E., Adamou, P., Pallari, E., Manos, G., Webb, A., Kotha, R., Morgen, O.V., Walls, L.E. and Ríos-Solís, L., 2024. Fuel Quality from Thermochemical Conversion and Biological Treatment of Biomass. *Industrial & Engineering Chemistry Research*, 63(44), pp.18699-18723.
- (2) Adamou P., Bellomi S., Harkou, E., Chen X., Delgado J., Dimitratos N., Manos G., Villa, A., and Constantinou, A., 2024. Hydrous Hydrazine Decomposition over Rh/Al₂O₃ catalyst: Experimental and CFD Studies. *Chemical Engineering Journal*, <https://doi.org/10.1016/j.cej.2024.152715>
- (3) Dabbawala, Aasif A., Walid Al Maksoud, Edy Abou-Hamad, Nikolaos D. Charisiou, Achilleas Constantinou, Eleana Harkou, Angeliki I. Latsiou et al. "Tuning of the acid sites in the zeolite-alumina composite Ni catalysts and their impact on the palm oil hydrodeoxygenation reaction." *Chemical Engineering Journal* 493 (2024): 152351.
- (4) Adamou, Panayiota, Eleana Harkou, Ali Bumajdad, Xander De Jong, Maarten Van Haute, Achilleas Constantinou, and Sultan Majed Al-Salem. "Effect of Polyethylene Pyrolysis Oil Hydrotreatment on the Pt/Al₂O₃ Catalyst: Experimental Characterization." *ACS omega* 9, no. 17 (2024): 19057-19062.
- (5) Adamou, Panayiota, Eleana Harkou, Alberto Villa, Achilleas Constantinou, and Nikolaos Dimitratos. "Ultrasonic reactor set-ups and applications: A review." *Ultrasonics Sonochemistry* (2024): 106925.
- (6) Anastasios I. Tsiotsias, Sanaa Hafeez, Nikolaos D. Charisiou, Sultan M. Al-Salem, George Manos, Achilleas Constantinou, Sara AlKhoori, Victor Sebastian, Steven J. Hinder, Mark A. Baker, Kyriaki Polychronopoulou, Maria A. Goula, Selective catalytic deoxygenation of palm oil to produce green diesel over Ni catalysts supported on ZrO₂ and CeO₂-ZrO₂: Experimental and process simulation modelling studies, *Renewable Energy*, 2023.
- (7) Adamou, P., Bellomi, S., Hafeez, S., Harkou, E., Al-Salem, S.M., Villa, A., Dimitratos, N., Manos, G. and Constantinou, A., 2023. Recent progress for hydrogen production from ammonia and hydrous hydrazine decomposition: A review on heterogeneous catalysts. *Catalysis Today*.
- (8) Yuan, C., Pan, Z., Wang, Y., Baena-Moreno, F.M., Constantinou, A. and Zhang, Z., 2023. Carbon Capture Enhancement by Water-Based Nanofluids in a Hollow Fiber Membrane Contactor. *Energy Technology*, 11(8), p.2300254.
- (9) Harkou, E., Adamou, P., Georgiou, K., Hafeez, S., Al-Salem, S.M., Villa, A., Manos, G., Dimitratos, N. and Constantinou, A., 2023. Computational studies on microreactors for the decomposition of formic acid for hydrogen production using heterogeneous catalysts. *Molecules*, 28(14), p.5399.
- (10) SM Al-Salem, M Van Haute, HJ Karam, A Hakeem... - *Industrial & Engineering Chemistry Research*, 2022. Fuel Range Properties of Oil and Wax Obtained from Catalytic Pyrolysis of Linear Low-Density Polyethylene in a Fluidized Bed Reactor (FBR). <https://doi.org/10.1021/acs.iecr.2c02875>
- (11) Al-Salem, S.M., Alosairi, Y. and Constantinou, A., 2022. Effect of COVID-19 lockdown measures on the plastic waste generation trends and distribution of microplastics in the Northwestern Arabian/Persian Gulf. *Ocean & Coastal Management*, 216, p.105979.
- (12) Al-Salem, S.M., Leeke, G.A., El-Eskandarany, M.S., Van Haute, M., Constantinou, A., Dewil, R. and Baeyens, J., 2022. On the implementation of the circular economy route for E-waste management: A critical review and an analysis for the case of the state of Kuwait. *Journal of Environmental Management*, 323, p.116181.
- (13) Tsiotsias, A.I., Charisiou, N.D., Harkou, E., Hafeez, S., Manos, G., Constantinou, A., Hussien, A.G., Dabbawala, A.A., Sebastian, V., Hinder, S.J. and Baker, M.A., 2022. Enhancing CO₂ methanation over Ni catalysts supported on sol-gel derived Pr₂O₃-CeO₂: An experimental and theoretical investigation. *Applied Catalysis B: Environmental*, 318, p.121836.
- (14) Hafeez, S., Harkou, E., Spanou, A., Al-Salem, S.M., Villa, A., Dimitratos, N., Manos, G. and Constantinou, A., 2022. Review on recent progress and reactor set-ups for hydrogen production from formic acid decomposition. *Materials Today Chemistry*, 26, p.101120.



Research Group on Thermodynamics and Transport Phenomena (T²PL)

Head: Pavlos S. Stephanou, Associate Professor

Team: PhD students: Panagiota Polykarpou, Amalia Ioannou, Kyproula Ioannou (co-advisement)

Undergraduate diploma Thesis students: Neofyta Kyriakidou (co-advisement)

Webpage: <https://pstephanou.wixsite.com/mysite>

A major theme of my research work has been the development of reliable constitutive models for describing the dynamics and equilibrium (i.e., no imposed flow) and flow behavior of complex polymeric fluids. At equilibrium, I derive and solve theories of polymer dynamics using simple molecular models of different polymeric systems (e.g., ring polymers). The aim is to understand the properties of various polymeric systems and to provide the avenue to design tailor-made systems with improved properties. In this case, we consider simple models that can be solved analytically or numerically, however, as we mention below, we strive to always compare the predictions of these theories with (equilibrium) Molecular Dynamics (MD) simulations. On the other end, under the imposition of a flow field, I rely on the use of non-equilibrium thermodynamics (NET), in particular on the Generalized Bracket and GENERIC formalisms, for developing closed-form balance equations for the fundamental hydrodynamic fields. No matter what the system is (say biological or chemical), it must obey the laws of thermodynamics. In particular, when the system is beyond equilibrium (e.g., under the influence of a flow field), its time evolution must be dictated by the laws of non-equilibrium thermodynamics (NET). This is exactly the reason for employing NET in my work: by construction, the new constitutive models obey the laws of thermodynamics. In my models, the underlying microstructure of the complex fluid is described by using structural variables, such as the conformation tensor for polymer chains (describing their average conformation), which are hydrodynamically coupled with the imposed flow field. The relation between microstructure (structural variables) and macroscopic observables (viscometric functions) takes eventually the form of a stress tensor equation. So far, I have developed generalized constitutive models for polymer melts, polymer solutions, and polymer nanocomposites. Currently, I am using NET to develop constitutive models for biomolecular fluids, such as blood.

In most cases, the resulting constitutive equations contain parameters whose values are not known. To overcome this, I resort to atomistic simulations, both (equilibrium) MD and non-equilibrium MD (NEMD). This allows me to develop interconnections between three different levels of system description: the atomistic or microscopic, the mesoscopic, and the macroscopic. As one moves from the atomistic to the macroscopic level (coarse-graining), the degrees of freedom of the system are significantly reduced, which results in a dramatic reduction in computational demands. However, coarse-graining must be done carefully to avoid the loss of important information. My work connects the three levels through the development of scale-bridging methodologies, and the outcome is a set of, closed-form, constitutive equations for the time evolution of the structural and hydrodynamic fields selected to describe the system.

More recently, I am also involved in developing modeling approaches for biological systems, such as predicting the deposition of a substance in various organs in our body, and describing the process used by specific organisms to produce important products, i.e., bioreactors.

Current Research-Brief Outline

1) Casting the Future: Optimizing the extraterrestrial 3D printing of cement-based structures

The colonization of other worlds has been a long-standing desire of humankind. This has yet to occur due to several challenges that we first need to master, such as gravity variations, extreme temperature fluctuations, and the use of extraterrestrial materials. In this project, funded by the European Space Agency (ESA), we propose to derive a constitutive rheological model that can accurately predict the rheological response of cementitious materials to be used under such severe variations. The model will be carefully calibrated using available experimental data from the literature. Then, the model will be employed in numerical simulations to scrutinize its capacity to properly address the cement flow behavior in 3D printing processes by considering both gravity and temperature variations. Finally, we aim to build a machine-learning algorithm that can provide optimal material properties given the gravity and temperature variations of a pre-selected extraterrestrial location. Overall, in this project we aim to optimize the 3D printing process using lunar regolith-derived materials to construct durable and sustainable infrastructure for future human habitats on extraterrestrial sites.

2) Optimized in silico sour gas processing for offshore deepwater gas technology applications.

This project stems from our recently acquired research grant PHD IN INDUSTRY/1222/0123 from the Cyprus RIF. Our main objective in the proposed research is to develop software for in silico optimization of the natural gas (NG) offshore desulphurization process. In more detail, we will conduct simulations of the desulphurization of NG and find the optimum operating parameters given the deepwater NG resource characteristics of the region (e.g., NG production flow rate and sour gas concentrations) and the regional offshore conditions (e.g., wind, wave, salinity) considering the regional safety and environmental regulations set for SOX emissions/sulphate effluents. Thereafter, computational fluid dynamics simulations will be conducted; a) to assess the dispersion of the emissions/effluents, both near- and far-field, and to provide directions for optimum layouts for floating processing facilities that comply with health and environmental regulations, and b) parameterize an easy-to-use Gaussian plume model. Finally, after coupling the two simulations a large database will be generated to train a predictive model to a) handle gas processing unit failures and b) for training operators.

3) Development of physiologically based pharmacokinetic (PBTK) models to address the diffusion of toxic substances in humans and animal models (collaboration with the BioLISYS Lab of Prof. A. Anayiotos and Dr K. Kapnisis, Dep. Mechanical Engineering and Materials Science and Engineering, CUT)

Local and systemic contamination caused by metal ions leaching from medical device materials is a significant and continuing health problem. The increasing need for verification and validation, and the imposition of stringent government regulations to ensure that the products comply with the quality, safety, and performance standards, have led regulatory bodies worldwide, such as U.S. Food and Drug Administration (FDA), to strongly recommend the use of modeling and simulation tools to support medical device submissions. We have first expanded a previously published PBTK model (and have provided an analytical solution to it) that predicts Nickel leaching from cardiovascular stents, by considering an additional separate tissue compartment to better resemble normal physiology and by the introduction of time-dependent functions to describe all biokinetic parameters. The new model is exercised in conjunction with state-of-the-art probabilistic, Monte Carlo methodology to calculate the predictions' confidence intervals and incorporate variability associated with toxicological biodistribution studies, which was

proposed for the first time in the literature. The quantitative consistency of the model-derived predictions is validated against reported data following the implantation of nickel-containing cardiovascular devices in humans and minipigs. This is particularly important as the acquisition of many *in vivo* samples is prohibitively costly and time-consuming; thus, the confidence intervals should be estimated as accurately as possible to avoid adverse local and systemic health problems. We have further proposed a new methodology for compartmental toxicological risk assessment that can be used for forward or reverse dosimetry. In a more recent publication, the PBTK model has been extended to include the most important tissues/organs and excreta. It also reports on the necessary *in vivo* data to parameterize it; to the best of our knowledge, this is the very first study that provides *in vivo* data for so many tissues/organs. Furthermore, a computer-implemented machine learning method is presented to perform a toxicological risk assessment of cardiovascular stents early in their device design cycle.

4) Elucidating the prediction of an asymmetric stress tensor and couple stresses from a NET perspective (theory and molecular simulations)

It has been almost exclusively assumed that the stress tensor employed in Fluid mechanics is symmetric, which implies that there is no interchange between macroscopic and molecular angular momenta. Such a consideration assumes that matter is continuously distributed throughout the body. Although this stands as a reasonable basis for analyzing the behavior of materials at the macroscale level, it fails to do so in cases where the microstructure size-dependency cannot be neglected, such as polymeric systems or suspensions. In fact, the micro-rotation of freely suspended particles in fluid suspensions gives rise to antisymmetric stress, known as couple stress. In this work, we aim to verify whether the above-mentioned modification of classical fluid mechanics is thermodynamically admissible by using NET. The model will also be verified by performing non-equilibrium molecular dynamics (NEMD) simulations using atomistic detail.

5) Development of a Gene regulatory model to enhance the prediction of bioethanol production by *Saccharomyces Cerevisiae* (collaboration with Prof. M. Koutinas)

The production of biofuels, such as bioethanol from lignocellulosic biomass, constitutes a promising process holding numerous advantages, such as reduction of fossil fuels and environmental pollution. Alcoholic fermentation is commonly performed by the industrial workhorse *Saccharomyces cerevisiae* which utilizes glucose as the primary energy source. In this work, we predict the kinetics of the microorganism in relation to glucose uptake and consumption, by developing a logic model with the use of logic gates. The model will then be parametrized by fitting its predictions against experimental data.

6) Modeling fluids that exhibit an anisotropic stress tensor

A cornerstone in classical fluid mechanics is the consideration of a symmetric stress tensor. Such an assumption implies that there is no interchange between macroscopic and molecular angular momenta and assumes that matter is continuously distributed throughout the body. Although this stands as a reasonable basis for analyzing the behavior of materials at the macroscale level, it fails to do so in cases where the microstructure size-dependency cannot be neglected. In fact, the micro-rotation of freely suspended particles in fluid suspensions gives rise to a couple stress contribution to the angular momentum balance. It is more likely that couple stresses arise in fluids with very large molecules since in many such cases the flow length scale is comparable to the characteristic length scale of the studied molecules. The anisotropic fluid theory (AFT) is found to be quite useful in the description of various types of lubricants, blood, and polymeric suspensions. However, these balance equations have not been derived from NET. The use of NET will greatly assist us in checking whether the proposed AFT equations violate the laws of NET, e.g., the second law of thermodynamics which necessitates a non-negative rate-of-

entropy production, allowing for alternative versions of it that are thermodynamically admissibility to be proposed, and consistently coupling of the hydrodynamic and thermodynamic fields at various levels. We have already derived the balance equations for the simplest possible case of a polar fluid for non-isothermal and compressible systems.⁴⁰ We wish to extend our work to handle more complex fluids such as polymeric systems, or active matter.

Recent publications

1. A. K. Ioannou, and P. S. Stephanou, "Non-equilibrium thermodynamics modelling of the rheological response of cement pastes", *J. Rheol.* 67, 849 (2023). [Selected as Featured article and highlighted in Scilight 2023, 221109 (2023)].
2. P. C. Konstantinou, and P. S. Stephanou*, "Predicting high-density polyethylene melt rheology using a multimode tube model derived using non-equilibrium thermodynamics", *Polymers*, 15, 3322 (2023)
3. M. Giakoumi, P. S. Stephanou, K. Kapnisis, and A. Anayiotos, "On the Development of Physiologically Based Toxicokinetic Models (PBTK) for Cardiovascular Implants", *Regulatory Toxicology and Pharmacology*, 144, 105489 (2023).
4. P. S. Stephanou, C. Georgantopoulos, A. Causa, and M. Wilhelm, "Modeling the Rheological Behavior of Silica Filled Rubber Compounds", *Phys. Fluids*, 35, 113332 (2023). (Selected as Editor's pick article)
5. M. Giakoumi, P. S. Stephanou, D. Kokkinidou, C. Papastefanou, A. Anayiotos, and K. Kapnisis, "A Predictive Toxicokinetic Model for Nickel Leaching from Vascular Stents", *ACS Biomaterials Science & Engineering*, 10, 2534–2551 (2024).
6. P. S. Stephanou, "Variable entanglement density constitutive rheological model for polymeric fluids", *Rheol. Acta.* 63, 379-395 (2024).
7. P. S. Stephanou, "Inconsistency between the micropolar theory and non-equilibrium thermodynamics for polar fluids", *J. Non-Equil. Thermo.* 49, 335-346 (2024).
8. P. S. Stephanou, "A model with coupled Maxwell modes using Giesekus' postulate", *Phys. Fluids* 36, 083109 (2024).
9. M. Giakoumi, K. Kapnisis, A. Anayiotos, and P. S. Stephanou, "Analytical Solutions of PBTK Models for Evaluating the Impact of Surface Diffusion Characteristics on the Leaching Profile of Implant Bioproducts", *Mathematical and Computational Applications*, 29, 101 (2024).



Research Group on Multiphase Separation Processes

Head: Nikola Evripidou, Lecturer (**hired in 2025**)

Team: Mariam Ezzat, Rafail Georgiou, Alexandros Nikolaou, and Sawina Papadopoulou

Our research focuses on modelling separation processes in multiphase systems, with particular emphasis on batch systems and pipe flows.

Batch separation processes are increasingly important for handling biomass-derived intermediates, which exhibit higher viscosity and lower volatility compared to fossil-derived materials due to stronger intermolecular interactions such as polar forces and hydrogen bonding. Traditional separation methods like distillation thus become economically challenging, making liquid-phase separation techniques like extraction increasingly attractive. Consequently, a deeper understanding of phase separation phenomena in dispersions is essential.

Dispersed pipe flows are also widely encountered in chemical manufacturing, pharmaceuticals, food processing, and petroleum industries. Gravity-driven separation at low velocities can be strategically utilised to design efficient in-line separators. However, in cases where dispersions are important for enhancing heat and mass transfer by increasing interfacial contact between substances, or minimising pipeline erosion or frictional losses during heavy oil transport, unintended separation may negatively affect process efficiency, underscoring the necessity of accurate predictive modelling.

Our specific research objectives include investigating dispersion stability, droplet sedimentation and coalescence mechanisms, and developing robust models to accurately predict separation dynamics. These models inform the design of both vertical and horizontal separators and help predict flow patterns in pipelines carrying liquid-liquid dispersions.

Our previous works have resulted in a mechanistic model that successfully predicts the separation behaviour of dispersed pipe flows, including flow pattern transitions occurring over long pipe lengths. Currently, we place particular emphasis on polydisperse systems, especially those with a wide distribution of droplet sizes, where smaller droplets require substantially longer times to settle. This delay results in prolonged separation times in batch vessels and persistent dilute layers in pipe flows, significantly influencing the overall separation performance.

Ultimately, our goal is to deliver robust predictive modelling frameworks that support sustainable and efficient separation processes across diverse industrial applications.

Publications

Evripidou, N., Avila, C. and Angeli, P., 2022. A mechanistic model for the prediction of flow pattern transitions during separation of liquid-liquid pipe flows. *International Journal of Multiphase Flow*, 155, p.104172.

Evripidou, N., Galvanin, F. and Angeli, P., 2023. Effect of coalescence models on the prediction of the separation of dispersed oil-water pipe flows. In *Computer Aided Chemical Engineering* (Vol. 52, pp. 1101-1106). Elsevier.

Evripidou, N., Galvanin, F. and Angeli, P., 2024. Mechanistic modelling of separating dispersions in pipes using model-based design of experiments techniques. *Chemical Engineering Science*, p.11950

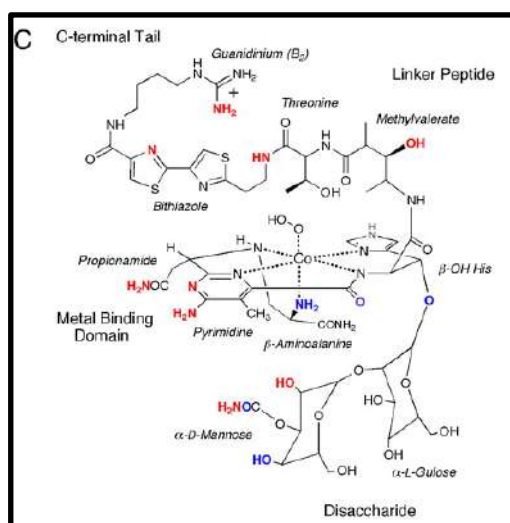


Research Group on Environmental Biospectroscopy

Head: Constantinou Koutsoupakis, Special Teaching Staff

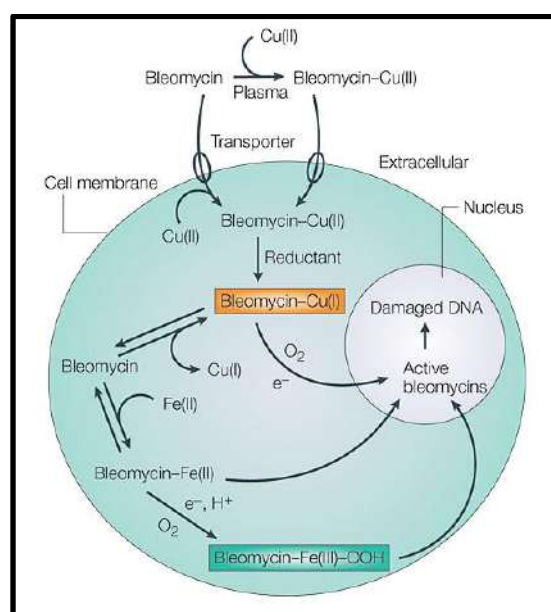
Team: Georgia Demetriou, Iakovi Agathokleous

The bleomycins (BLMs, Figure 1) are a group of natural glycopeptides produced by *Streptomyces verticillus* that have potent antitumor activity against lymphomas, head and neck cancers and testicular cancer. The BLMs' therapeutic efficacy is proposed to be related to their ability to cause both single-stranded (ss) and double-stranded (ds) DNA damage in the presence of the required cofactors (Fe(II) or Cu(I), O₂ and a one-electron reductant) (Figure 2). The ds-DNA cleavage events have long been believed to be the major source of BLMs' cytotoxicity.



The cytotoxic effect of BLM is believed to result from the drug's ability to bind iron, activate oxygen, and cleave DNA and RNA. Furthermore, the iron complex of the drug (Fe-BLM), is remarkably selective in both the sequences that are cleaved, with a preference for 5'-GyPy-3' sequences (*i.e.* pyrimidine bases that lie 3' to a guanine), and in the chemical mechanism, with the initial event being abstraction of the 4'-hydrogen from the deoxyribose ring (Figure 3). Several features of Fe-BLM have been

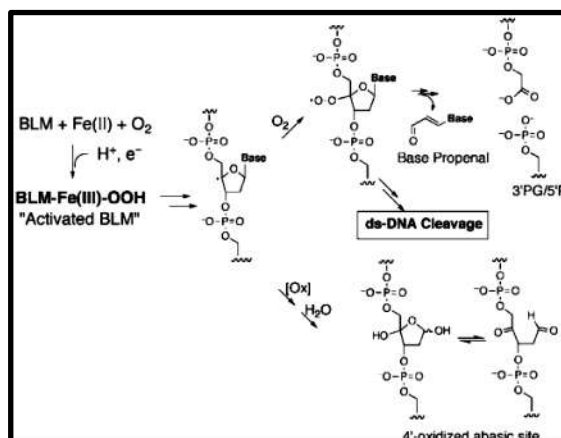
identified that may explain the ability to activate oxygen, such as the presence of a delocalized π -electron buffer around iron and the strong ironpyrimidine π -backbonding. In contrast, the structural features of Fe-BLM responsible for the sequence and chemical specificity of the DNA degradation reaction remain obscure.



Indeed, there have been reports implicating almost every region of the Fe-BLM molecule, including the C-terminal bithiazole and dimethylsulfonium groups, the N-terminal metal binding site, the primary amine of the β -aminoalanine residue, and the "linker region" that connects the metal binding site with the bithiazole group, as being responsible, at least in part, for the sequence selectivity of Fe-BLM-mediated DNA degradation. While many of these reports appear to provide conflicting results, the one requirement from all of these studies is that for sequencespecific cleavage of DNA to occur, both the metal binding site and bithiazole moiety must be intact.

In this work, we aim to characterize spectroscopically changes in the metal binding site of Fe-/Cu-BLM induced by complexation with DNA, using optical, and Fourier transform infrared (FTIR) spectroscopies. This way we obtain structural information regarding the local environment of the metal site of Fe-/Cu-BLM. We also extended our studies to Fe-/Cu-BLM bound to the self-complementary hexanucleotides, d(CGCGCG) and d(ATATAT), with the intent of detecting structural changes in the metal

binding site that correlate with the sequence specificity of DNA cleavage.



Selected Publications

1. Koutsoupakis C., Soulimane T., Varotsis C. *Accounts of Chemical Research* 52 (2019) 1380-1390.
2. Koutsoupakis C., Soulimane T., Varotsis C. *Chemistry – A European Journal* 21 (2015) 4958-4961
3. Koutsoupakis C., Soulimane T., Varotsis C. *Journal of Biological Chemistry* 287 (2012) 37495-37507.



Research Group on Environmental Toxicology (**oikotoxicologia**)

Head: Marlen I. Vasquez, Special Teaching Staff

Team: Eleni Christoforou (Ph.D.), Panayiota Pissaridou (Ph.D.), Christoforos Pavlou (Ph.D.), Gregoris Notarides (M.Sc.), Soteris Meletiou (M.Sc.), Christiana Tourapi (M.Sc.), Ioannis Konstantinou (M. Sc.), Andreas Christou (M. Sc.), Stylianos Hadjipetrou (M. Sc.), Philip Fayad (M.Sc.)

Webpage: <http://www.oikotoxicologia.org>

Keywords: environmental toxicology; molecular bioassessment; ecological engineering; molecular ecology; water systems

“Towards integrated surveillance of natural and engineered ecosystems”

It is widely accepted that our greatest challenges to achieving good status for water bodies primarily relate to systemic problems. Aquatic ecosystems have inherent higher complexity as they are prone to multiple pressures that interact dynamically over a period of time. Among our new concerns is the occurrence of contaminants of emerging concern including both chemical and biological contaminants.

Even though our target is ultimately to preserve and even improve the quality of aquatic ecosystems we still need to increase our understanding of important ecosystem structures and functions. Adding to this, the efficiency of treatment processes is still evaluated using traditional and sum parameters that are not sensitive enough to timely identify pressures that can negatively and adversely affect receiving water bodies. It is, therefore, a stringent necessity to improve our monitoring tools. High-throughput sequencing methods can now more easily help us decipher the structure of biological communities in an accurate and time-efficient manner. This approach complements our current monitoring schemes that are based primarily on morphotaxonomy only. Our current practices are known to be more time-consuming and require high taxonomic expertise. This is even more challenging in regions of high biodiversity and especially on islands in which local expertise is usually scarce.

Our interdisciplinary group aims at increasing knowledge of aquatic ecosystem structure at small and microscale to increase understanding of ecosystem functions. We are on the quest of identifying bioindicators that can predict multiple pressure effects. Ultimately the goal is to dismantle multiple pressures on aquatic ecosystems caused primarily by human activities. In this sense, our work contributes to the One Health approach in which ecological health is intertwined with human health as well. Our activities are in line with SDGs 3,6, 13,14 and 15.

During the period 2022-2024 our group has worked on the following:

1. Increasing knowledge of aquatic ecosystem structures and functions

To effectively apply high throughput sequencing methods, it is indispensable to have curated national reference databases for species. In collaboration with stakeholders, reference databases for freshwater fish, macroinvertebrates and mosquito species are under development. In particular, our work substantially supported better understanding of the current distribution of the “critically endangered” on the IUCN Red List European Eel, *Anguilla anguilla* (Griffiths et al. 2023)

The surveillance system for insects of medical established during 2018-2022, detected the presence of the invasive species *Aedes aegypti* and *Aedes albopictus*, leading to a substantial shift on the practices for mosquito population management in the island (Vasquez et al. 2023).

2. Disentangling effects of multiple stressors on microbial communities

To better understand the structure of microbial communities we deploy metabarcoding techniques. These are compared to traditional methods to evaluate their sensitivity and specificity indicating great potential for application and maturity (Pissaridou et al 2021a). To identify the effects of stressors on natural aquatic bacteria (Conte et al 2021) and diatom communities (Pissaridou et al 2021b), we apply metabarcoding techniques and then correlate them to environmental parameters. We also investigate the structure of bacterial communities on synthetic surfaces such as plastic ones throughout their life cycle and during their movement between compartments (Martinez Campos et al 2022). As a result, we propose new microbial molecular indices that can be used during the bioassessment of aquatic ecosystems to increase understanding of ecological functions with regard to multiple stressors effects (Mareckova et al 2021).

3. Elucidating ecotoxicological patterns during waste valorization and water treatment processes

Evaluating the ecotoxicological pattern towards model organisms acting as sentinels of acute and chronic toxicity can improve the efficiency of treatment processes. Process optimization meeting high environmental criteria can significantly promote fit-for-purpose technologies and the protection of receiving environments. In this framework, we evaluate the evolution of transformation products of contaminants of emerging concern during photolytic (Ofrydopoulou et al 2020), biotransformation (Koutinas et al 2019, Stylianou et al 2018) and bilge wastewater treatment processes (Mazioti et al 2021). In the same framework, these methods are used for process optimization of waste valorization strategies for alkaloids (Parmaki et al 2018) and industrial wastewater (Parmaki et al 2020).

4. Engaging stakeholders at the regional, national and international level

To protect aquatic environments in the long term, the active engagement of stakeholders is needed. In this sense, we develop critical reviews on implementing current policies to promote responsible research and innovation (Theodotou Schneider et al 2022), showcase good practices on the ways to create collaborative networks (Rotter et al 2021, Rotter et al 2020) and open up directions of the blue biotechnology sector that can be further exploited (Rotter et al 2022, Rotter et al 2021).

During 2018-2022, two Post-Doctoral, three M.Sc. and seven B.Sc. projects were successfully completed. Apart from this, we hosted twelve academics/postgraduate researchers and four undergraduate researchers through ERAMUS+ placements or STSM grants. We participated in the scientific committee of the NEREUS COST Action final conference event XENOWAC 2018 "Challenges and Solutions related to Xenobiotics and Antimicrobial Resistance in the Framework of Urban Wastewater Reuse: Towards a Blue Circle Society" and the DNAqua International Conference of the DNAqua-Net COST Action "on the use of DNA for water biomonitoring". We have co-chaired a session on Genetic approaches to assess and monitor freshwater biodiversity and ecosystem functions at the SEFS12 conference. We have hosted a training school for the Ocean4Biotech COST Action "an ocean of opportunities in the Blue Biotechnology sector: Seagrass biotechnology and biomaterials as case studies" and a joint ECDC-WHO-IAEA training school on "developing vector control needs assessment"



(a) Assessing diatom communities in an intermittent river; (b) calculating seagrass density; (c) participating in a response plan to increase resilience to the climatic crisis; (d) evaluating ecological health bioindicators and physicochemical parameters; (e) hosting a training school on seagrass biotechnology and biomaterials; (f) hosting a WHO-IAEA-ECDC workshop on vector control needs assessment

Selected publications

Blancher P, Lefrançois E, Rimet F et al (2022) A strategy for successful integration of DNA-based methods in aquatic monitoring, *Metabarcoding and Metagenomics* 6: 215–226

Eroldogan O, Glencross B, Novoveska L, Gaudêncio S, Rinkevich B, Varese C et al (2022) From the sea to aquafeed: A perspective overview *Reviews in Aquaculture* 2022:1-30

Griffiths N, Wright R, Hänfling B, Bolland J, Drakou K, Sellers G, Zogaris S, Tziortzis I, Dörflinger G, **Vasquez MI** (2023) Integrating environmental DNA monitoring to inform eel (*Anguilla anguilla*) status in freshwaters at their easternmost range - A case study in Cyprus, *Ecology and Evolution* 13(2):e9800

Tsipa A, Papalli M, Christou A, Pissaridou P, **Vasquez MI** (2023) Ex-situ biological treatment of industrial saline seafood wastewater by salt-tolerant mixed cultures and phytotoxicity evaluation *Journal of Environmental Chemical Engineering* 11(1):109195

Kircher M, Aranda E, Panayiotopoulos A, Radojčić-Rednovnikov I, Romantschuk M, Ryberg M, Schock G, Shilev S, Stanescu MD, Stankeviciute J, Surmacz-Górska J, Tsipa A, **Vasquez MI**, Villano M, Vorgias CE (2023) Treatment and valorization of biowaste in the EU, *EFB Bioeconomy journal* 3, 100051.

Theodotou Schneider X, Kalamujić Stroil B, Tourapi C, Rebours C, Novoveska L, **Vasquez MI**, Gaudêncio SP (2023) Improving awareness, understanding, and enforcement of responsibilities and regulations in Blue Biotechnology *Trends in Biotechnology* S0167-7799(23)00158-0.

Rotini A, Conte C, Winters G, **Vasquez MI**, Migliore L (2023) Undisturbed *Posidonia oceanica* meadows maintain the epiphytic bacterial community in different environments *Environmental Science and Pollution Research* 30, 95464–74

Chiquillo K, Barber P, **Vasquez MI**, Cruz-Rivera E, Willette D, Winters G, Fong P (2023) An invasive seagrass drives its own success in two invaded seas by both negatively affecting native seagrasses and benefiting from those costs, *Oikos* 3: e09403

Novoveská L, Laurentius Nielsen S, Orhan Eroldoğan OT, Haznedaroglu BZ, Rinkevich B, Fazi S, Robbens J, **Vasquez MI**, Einarsson H (2023) Overview and challenges of large-scale cultivation of photosynthetic microalgae and cyanobacteria *Marine Drugs* 21(8):445

Wissner JL, Almeida JR, Grilo IG, Oliveira JF, Brízida C, Escobedo-Hinojosa W, Cunha I, Sobral RG, Vasconcelos V, Gaudêncio SP (2024) Novel metabolite madeirone and neomarinone extracted from *Streptomyces aculeoletus* as marine antibiofilm and antifouling agents, *Frontiers in Chemistry*, 12:1425953 IF 3.8.

Parmaki S, **Vasquez MI**, Patsalou M, Gomes RFA, Simeonov S, Mateus A, Carlos A, Koutinas M (2024) Ecotoxicological assessment of biomass-derived furan platform chemicals using aquatic and terrestrial bioassays, *Environmental Science: Processes & Impacts* 26, 686-699 IF 5.3.

Sabotič J, Bayram E, Ezra D, Gaudêncio SP, Haznedaroğlu BZ, Janež N, Ktari L, Luganini A, Mandalakis M, Safarik I, Simes D, Strodem E, Toruńska-Sitarz A, Varamogianni – Mamatsi D, Varese GC, **Vasquez MI** (2024) A guide to the use of bioassays in exploration of natural resources *Biotechnology Advances* 5(71):108307 IF 16.

Vasquez MI, Notarides G, Meletiou S, Patsoula E, Kavran M, Michaelakis A, Bellini R, Toumazi T, Bouyer J, Petrić D (2023) Two invasions at once: update on the introduction of the invasive species *Aedes aegypti* and *Aedes albopictus* in Cyprus – a call for action in Europe, *Parasite* 30(41) IF 2.9.

Novoveská L, Laurentius Nielsen S, Orhan Eroldoğan OT, Haznedaroglu BZ, Rinkevich B, Fazi S, Robbens J, **Vasquez MI**, Einarsson H (2023) Overview and challenges of large-scale cultivation of photosynthetic microalgae and cyanobacteria *Marine Drugs* 21(8):445 IF 5.4.

List of students who graduated in years 2022 - 2024

Ph.D. in Environmental Science & Technology

| | | |
|-----------------------------|---------------------------|---------------------------------|
| Kyriakou, Maria (2024) | Komodiki, Antigoni (2024) | Konstantinou, Barbara (2024) |
| Paageorgiou, Marios (2024) | Photiou, Panayiota (2024) | Charalambous, Panayiotis (2024) |
| Ziogou, Isidoros (2023) | Keliri, Eleni (2023) | Peratikou, Stephanie (2023) |
| Tselios, Charalambos (2023) | Parmakki, Stella (2022) | |

Ph.D. in Agricultural Sciences, Biotechnology and Food Science

| | |
|---------------------|---------------------------|
| Liapi, Maria (2024) | Christophi, Marina (2022) |
|---------------------|---------------------------|

M.Sc. in Agriculture Biotechnology

| | | |
|-------------------------------------|------------------------------|-------------------------------|
| Galanis, Demetrios (2024) | Goumenos, Christos (2024) | Lagios, Stylianos (2024) |
| Louca Stavros (2024) | Makris, Georgios (2024) | Pavlou, Niki (2024) |
| Tsalakou, Andria (2024) | Charalambous, Eliana (2024) | Alkiviade, Aristi (2023) |
| Artymatas, Georgios (2023) | Demetriade, Stavroula (2023) | Evlavi, Argyro (2023) |
| Komninaki, Krystallia (2023) | Kosti, Alexandros (2023) | Martoude, Maria (2023) |
| Militou, Christophora (2023) | Michael, Sotiroulla (2023) | Moyseos, Maria (2023) |
| Neoptolemou, Andreas (2023) | Nikolaou, Irene (2023) | Polyviou, Vassilis (2023) |
| Tzionis, Antonios (2023) | Pharakalla, Anthie (2023) | Zenonos, Demetrios (2022) |
| Ioannou, Ionna (2022) | Kizi, Nicoletta (2022) | Kitalides, Demetris (2022) |
| Costa, Raphaella (2022) | Michael, Vassiliki (2022) | Michael, Charalambia (2022) |
| Papademetriou, Chrysovalando (2022) | Papamichael, Philio (2022) | Stephanou, Konstantinos, 2022 |

B.Sc. in Environmental Science & Technology

Charalambides, Michael (2023) Vasileiou, Lambros (2022) Matsagkou, Stavros (2022)
Panayiotou, Christina (2022) Papapanteli, Panayiota (2022) Frantzi, Nicoletta (2022)
Charlamboude, Katerina (2022)

B.Sc. in Chemical Engineering

Antoniou, Nicolas (2024) Atanasova, Nicole (2024) Achilleidis, Constantinos (2024)
Yiannakou, Stella (2024) Elia, Eleni (2024) Nicolaou, Andreas (2024)
Nicolaou, Maria (2024) Peteinou, Pantelitsa (2024) Piripitsi, Styliani (2024)
Procopiou, Antonis (2024) Stylianou, Liza (2024) Antoniou, Leoni (2023)
Georgiou, Kyproula (2023) Georgiou, Maria (2023) Demetriou, Maria (2023)
Iacovou, Styliani (2023) Ioannidou, Raphaella (2023) Karachaliou, Panayiota (2023)
Kouti, Imat (2023) Manoli, Margarita (2023) Papademetriou, Maria (2023)
Symeonidou, Constantina (2023) Christodoulou, Aliko (2023) Christou, Pantelitsa (2023)
Christophi, Evgenia (2023) Christophidou, Christina (2023) Adamou, Panayiota (2022)
Efraim, Panayiota (2022) Ioannou, Amalia (2022) Kantzias, Nicolas (2022)
Karetsou, Natasa (2022) Kyriakou, Christina (2022) Panayiotou, Christina (2022)
Paschalidou, Georgia (2022) Siatra, Philippia (2022) Spanou, Anastasia (2022)

Bs.C. in Agricultural Sciences, Biotechnology and Food Science (Food Science & Technology)

Antoniou, Antonis (2024) Theophanous, Demetria (2024) Ioannou, Stavri (2024)
Kapilla, Kyriaki (2024) Kyriakou, Christina (2024) Constantinou, Elena (2024)
Bisbiroulla, Andria (2024) Nicola, Photini (2024) Onouphriou, Ioannis (2024)

| | | |
|----------------------------------|--------------------------------|-----------------------------|
| Papakaroulla, Despoina (2024) | Pieri, Michaella (2024) | Pitsillou, Antroulla (2024) |
| Shikki, Elena (2024) | Charalambous, Elena (2024) | Christou, Myrianthi (2024) |
| Barasa, Daniel (2023) | Agroti, Michaella (2023) | Vanezi, Christina (2023) |
| Genethliou, Christophoros (2023) | Georgiou, Constantinos (2023) | Demetriou, Georgia (2023) |
| Kakouri, Aimilia (2023) | Karagianni, Marina (2023) | Kephala, Raphaelia (2023) |
| Koilani, Violetta (2023) | Mavromichalou, Katerina (2023) | Nicolaou, Irene (2023) |
| Nicoletti, Stavriani (2023) | Papasawa, Constantina (2023) | Patroklou, Androniki (2023) |
| Patroklou, Eleni (2023) | Petrou, Gregoria (2023) | Polydorou, Maria (2023) |
| Piri, Panayiota (2023) | Athanasidou, Katerina (2022) | Avgousti, Christiana (2022) |
| Constantinou, Paraskevi (2022) | Xenarou, Styliani (2022) | Stylianou, Stella (2022) |

BS.C. in Agricultural Sciences, Biotechnology and Food Science (Animal and Dairy Science)

| | | |
|------------------------------|----------------------------------|--------------------------------------|
| Ssebude, Simon (2024) | Antoniadou, Chrysovalando (2024) | Vasileiou, Spyros (2024) |
| Zaou, Georgios (2024) | Troullis, Andreas (2024) | Theodosiou, Sophia (2024) |
| Kastori, Michaella (2024) | Symeonidou, Garyphalanthi (2024) | Agesilaou, Paraskevi (2023) |
| Georgiades, Andreas (2023) | Georgiou, Leonidas (2023) | Karmiotou, Argyro (2023) |
| Kyriakou, Alexandra (2023) | Koukkouli, Avgousta (2023) | Michaelidou, Michaelina Maria (2023) |
| Nikolaidou, Sergia (2023) | Procopiou, Vasileia (2023) | Hadjipapa, Revekka (2023) |
| Chrysostomou, Lenos (2023) | Andreou, Demetris (2022) | Demosthenous, Antonis (2022) |
| Pantziarou, Antria (2022) | Papaconstantinou, Nepheli (2022) | Piperidou, Evgenia (2022) |
| Stavrou, Constantinos (2022) | | |

Bs.C. in Agricultural Sciences, Biotechnology and Food Science (Crop Science and Technology)

| | | |
|------------------------------------|--------------------------------|-----------------------------|
| Avraamides, Orestis (2024) | Theodorou, Constantinos (2024) | Karnaou, Nearchos (2024) |
| Karsera, Chrystalla (2024) | Pachniotou, Aphrodite (2024) | Phaidonos, Antreas (2024) |
| Hadjiyiannakou, Spyridoulla (2024) | Christodoulou, Despo (2024) | Andreou, Konstantina (2023) |
| Damianou, Constantinos (2023) | Demetriou, Tatiana (2023) | Kyriakides, Nikitas (2023) |
| Markou, Anastasia (2023) | Xadjisolomou, Efraimia (2023) | Galanis, Demetrios (2022) |
| Goumenos, Christos (2022) | Zoumos, Andreas (2022) | Kokkinou, Diamanto (2022) |
| Koupparis, Angelos (2022) | Kyriakou, Evangelia (2022) | Kyriakou, Loucas (2022) |
| Louca, Stavros (2022) | Makrygiorgis, Michalis (2022) | Michael, Kyriakos (2022) |
| Michael, Stephanos (2022) | Neoptoleμου, Varnavas (2022) | Socratous, Demos (2022) |
| Toumazou, Georgios (2022) | | |

ANNEX II

List of research projects (ongoing or completed) during 2022-2024

I. Projects funded or supported by European Union programmes

| Project Title | Funding Programme | Own Budget (€) | Total Budget (€) | Period | Contact person |
|---|-------------------|----------------|------------------|--------|--------------------------|
| Towards innovative methods for energy performance assessment and certification of buildings | EU HORIZON EUROPE | 22.727,50 | 1.996.586,55 | 2022 | Alexandros Charalambides |
| Quick Challenge-driven, Human-centered Co-Creation mechanism for INDUStry-Academia Collaborations | EU HORIZON EUROPE | 114.100,00 | 1.999.843,75 | 2022 | Alexandros Charalambides |
| Demonstration of innovative functional food... for conscientious European Consumers | EU HORIZON EUROPE | 205.250,00 | 7.043.096,63 | 2023 | Alexandros Charalambides |
| MariTech Talent Programme | EU HORIZON EUROPE | 106.875,00 | 499.375,00 | 2023 | Alexandros Charalambides |
| Cultivating Sustainable Economies in the Mediterranean through Valorisation of Bushland Ecosystems | ERASMUS+ | 41.844,00 | 250.000,00 | 2024 | Andreas Katsiotis |
| Achieving ecological resilient dynamism for the european food system through consumer-driven policies, socio-ecological challenges, biodiversity, data driven policy, sustainable futures | EU HORIZON 2020 | 431.982,5 | 13.628.428,50 | 2022 | Andreas Katsiotis |
| Development of Innovative priming technologies safeguarding yield security in soft fruit crops through acutting edge etchnological approach | EU HORIZON 2020 | 894.500,00 | 1.496.875,00 | 2022 | Giorgos Manganaris |
| Training and mentorship based adult rural women empowerment in the field of green entrepreneurship | ERASMUS+ | 25.411,00 | 232.249,00 | 2022 | Dimitris Tsaltas |
| AGrOecOlogy for weeDs | EU HORIZON EUROPE | 200.000,00 | 4.999.742,00 | 2023 | Dimitris Tsaltas |

| Project Title | Funding Programme | Own Budget (€) | Total Budget (€) | Period | Contact person |
|--|-----------------------|----------------|------------------|--------|-----------------------|
| A holistic Approach towards onsite hospital wastewater treatment | EU - LIFE | 429.070,00 | 3.214.280,00 | 2023 | Dimitris Tsaltas |
| Climate neutral initiatives for growing health and care Unmet requirements | EU HORIZON 2020 | 228.250,00 | 5.999.517,50 | 2023 | Ioannis Vyrides |
| MONITORING AND DETECTION OF BIOTIC AND ABIOTIC POLLUTANTS BY ELECTRONIC, PLANTS AND MICROORGANISMS BASED SENSORS | EU HORIZON 2020 | 225.000,00 | 4.644.952,00 | 2024 | Constantinos Varotsis |
| Exposure to Electromagnet fields and planetary health | EU HORIZON 2020 | 116.000,00 | 6.635.055,00 | 2022 | Menelaos Stavrinos |
| Recycling process trains of waste bioplastics | EU HORIZON EUROPE | 92.538,00 | 115.560,00 | 2022 | Michalis Koutinas |
| Casting the Future: Optimizing the extraterrestrial 3D printing of cement-based structures | European Space Agency | 90.000,00 | 180.000,00 | 2024 | Pavlos Stephanou |

Overall, the total budget of the projects was **52.935.560,93 EUROS** and the budget contributed to CUT was **2.791.565,50 EUROS**.

II. Projects funded by the Research Promotion Foundation of Cyprus

| Project Title | Own Budget (€) | Total Budget (€) | Period | Contact person |
|--|----------------|------------------|--------|--------------------------|
| A SYSTEM-INTEGRATING AND ENERGY-FORECASTING TOOL FOR RENEWABLE ENRGYSOLUTIONS | 134.000,00 | 226.800,00 | 2024 | Alexandros Charalambides |
| A low cost framework | 10.000,00 | 10.000,00 | 2022 | Alexandros Charalambides |
| Development of a waste biomass conversion system that incorporates liquefaction andpyrolysis technologies for producing biochemicals for the maritime sector | 99.340,00 | 600.000,00 | 2024 | Achilleas Konstantinou |
| Novel nano-enchaned carbon captures (CCS) systems for industrial post combustion processes | 223.200,00 | 588.318,00 | 2024 | Achilleas Konstantinou |
| Advancing the energetic performance of upcycled biopolyol production towards the green transition of construction materials via innovative continuous reactor and Industry 4.0 tools | 157.800,00 | 599.724,80 | 2024 | Achilleas Konstantinou |
| Investigating the phytochemical profile and in-vitro bioactive properties of endemic plant extracts from Cyprus for potential use in medicine and agriculture | 12.600,00 | 59.990,26 | 2022 | Vasilis Photopoulos |
| Development of green tech functionalised, biogradable fibrous plant nursery bags in ecological seedings cultivation | 103.200,00 | 574.575,00 | 2023 | Vasilis Photopoulos |
| ESTABLISHMENT OF A PLATFORM FOR THE DISCOVERY OF NOVEL ANTIMICROBIAL AND ANTIDIABETIC AGENTS FROM NATURAL SOURCES | 174.367,20 | 174.367,20 | 2022 | Vlasios Goulas |
| Fruits thRiving in agronoMy powered by photovoltaics (PV) | 152.640,00 | 666.788,00 | 2024 | George Manganaris |
| Water Pretreatment System for Rapid Preconcentration and DNA Extraction of Viruses and Bacteria | 33.600,00 | 268.100,00 | 2023 | George Botsaris |
| Development of Advanced Antimicrobial Nanofibrous Textiles through Effective Nanofinishing | 125.790,00 | 677.040,00 | 2024 | Dimitris Tsaltas |
| BioMethane as a Drop-In -Marinwe -BioFUEl: Developing a Virtual Gas-Grid Solution | 10.800,00 | 199.995,00 | 2022 | Ioannis Vyrides |
| Towards bioCNG as a Carbon Negative Maritime Power Source | 79.200,00 | 599.990,00 | 2024 | Ioannis Vyrides |
| A sustainable and innovative management system for toxic cyanobacteria blooming of surface waters with combined energy prduction ,sustainable agriculture and food safety | 198.607,92 | 198.607,92 | 2022 | Maria Antoniou |
| Biophotonics technology for in-situ, fast, accurate and cost-effective milk analysis | 70.280,00 | 266.630,00 | 2022 | Maria Aspri |
| Biorefinery Technologies for Exploitation of Citrus Processing Residues | 111.476,05 | 252.334,08 | 2022 | Michalis Koutinas |

| | | | | |
|--|------------|--------------|------|-----------------------|
| Development of Advanced Immobilized Biocatalysts Employing Tailor-Made Nanobiochar for Sustainable Bioethanol Production from Food-Derived Biowaste | 114.901,00 | 254.828,00 | 2023 | Michalis Koutinas |
| A whole-plant phenotyping platform to improve plant productivity, agricultural sustainability, and resilience to climate change. | 143.984,00 | 2.388.687,00 | 2024 | Nikolaos Nikoloudakis |
| A Comprehensive Cereal Supply Chain Quality Control and Decision Making Framework | 97.013,00 | 700.877,00 | 2024 | Nikolaos Nikoloudakis |
| Identification of Medicinal/Aromatic plants properties and improving quality, nutritive value and storability of fresh and dry products to support SME competitiveness | 174.790,00 | 259.573,38 | 2022 | Nikolaos Tzortzakis |
| Optimized in silico sour gas processing for offshore at the Mediterranean Region | 20.400,00 | 150.000,00 | 2023 | Pavlos Stephanou |
| Determination and certification of the factors affecting Halloumi cheese quality | 5.000,00 | 5.000,00 | 2022 | Photis Papademas |
| Νέα εκλεκτικά χημικά υλικά Ουρανιίου για την ανάπτυξη νέων αισθητήρων και δεσμευτών ουρανίου ΑΠΟ τη θάλασσα | 2.824,00 | 200.055,00 | 2022 | Chrysoula Drouza |

Overall, the total budget of the projects was **9.922.280,64 EUROS** and the budget invested by CUT was **2.255.813,17EUROS**.

III. Projects funded or supported by other national and international sources

| Project Title | Funding Organisation | Own Budget (€) | Total Budget (€) | Period | contact person |
|--|--|----------------|------------------|--------|----------------------|
| Ενίσχυση της ανθεκτικότητας της πατάτας στον παγετό με τη χρήση της χημικής έναυσης | ΠΡΟΓΡΑΜΜΑ ΑΓΡΟΤΙΚΗΣ ΑΝΑΠΤΥΞΗΣ ΤΗΣ ΕΛΛΑΔΑΣ (ΠΑΑ) 2014 – 2020 ΜΕΤΡΟ 16 | 139.490,74 | 444.301,99 | 2022 | Vassilis Photopoulos |
| ΠΙΛΟΤΙΚΗ ΕΦΑΡΜΟΓΗ ΤΟΥ ΠΡΟΤΥΠΟΥ “ΑΝΤΙΟΧCERT” ΣΕ ΚΥΡΙΑ ΑΓΡΟΔΙΑΤΡΟΦΙΚΑ ΠΡΟΪΟΝΤΑ | ΠΡΟΓΡΑΜΜΑ ΑΓΡΟΤΙΚΗΣ ΑΝΑΠΤΥΞΗΣ ΤΗΣ ΕΛΛΑΔΑΣ (ΠΑΑ) 2014 – 2020 ΜΕΤΡΟ 16 | 70.000,00 | 44.499.878,00 | 2023 | Vlassios Goulas |
| Training network for exploring microalgae diversity for the development of novel antiviral compounds | ΕΘΝΙΚΟ ΚΕΝΤΡΟ ΕΡΕΥΝΑΣ ΚΑΙ ΤΕΧΝΟΛΟΓΙΚΗΣ ΑΝΑΠΤΥΞΗΣ - ΕΚΕΤΑ | 55.200,00 | 772.800,00 | 2022 | Dimitris Tsaltas |
| Εκπόνηση Μελέτης σχετικά με την οριοθέτηση της εισβολής των ειδών <i>Aedes aegypti</i> και <i>albopictus</i> | Υπουργείο Υγείας | 464.553,31 | 464.553,31 | 2023 | Marlen Vasquez |
| Biodiversity of Wild bees in Eastern Sovereign Base Area (ESBAs) in Cyprus | DARWIN PLUS | 56.430,00 | 52.668,00 | 2023 | Menelaos Stavrinides |
| Αποτύπωμα του Αυθεντικού Κυπριακού Χαλλουμιού (Π.Ο.Π.) | Απευθείας Ανάθεση Ερευνητικού Έργου από Υπουργείο Γεωργίας Αγροτικής Ανάπτυξης και Περιβάλλοντος | 100.000,00 | 200.000,00 | 2024 | Photis Papademas |

Publications of Faculty staff in 2022-2024*

(*Based on the Scopus® database as of April 2025)

2024

Aalam, F., Rezaei Nejad, A., Mousavi-Fard, S., Raji, M., Nikoloudakis, N., Goumenaki, E., & Fanourakis, D. (2024). Water Deficit Severity during the Preceding Year Determines Plant Tolerance to Subsequent Year Drought Stress Challenges: A Case Study in Damask Rose. *Horticulturae*, 10(5), 462. <https://doi.org/10.3390/horticulturae10050462>

Adamou, P., Bellomi, S., Harkou, E., Chen, X., Delgado, J. J., Dimitratos, N., Manos, G., Villa, A., & Constantinou, A. (2024). Hydrous hydrazine decomposition over Rh/Al₂O₃ catalyst: Experimental and CFD studies. *Chemical Engineering Journal*, 493, 152715. <https://doi.org/10.1016/j.cej.2024.152715>

Adamou, P., Harkou, E., Bumajdad, A., de Jong, X., van Haute, M., Constantinou, A., & Al-Salem, S. M. (2024). Effect of Polyethylene Pyrolysis Oil Hydrotreatment on the Pt/Al₂O₃ Catalyst: Experimental Characterization. *ACS Omega*, 9(17), 19057–19062. <https://doi.org/10.1021/acsomega.3c09729>

Adamou, P., Harkou, E., Villa, A., Constantinou, A., & Dimitratos, N. (2024). Ultrasonic reactor set-ups and applications: A review. *Ultrasonics Sonochemistry*, 107, 106925. <https://doi.org/10.1016/j.ultsonch.2024.106925>

Alneyadi, K. S. S., Almheiri, M. S. B., Tzortzakakis, N., di Gioia, F., & Ahmed, Z. F. R. (2024). Organic-based nutrient solutions for sustainable vegetable production in a zero-runoff soilless growing system. *Journal of Agriculture and Food Research*, 15, 101035. <https://doi.org/10.1016/j.jafr.2024.101035>

Amoiridis, A., Papanikolaou, M., Drouza, C., Kabanos, T. A., & Keramidas, A. D. (2024). Spectroscopically labelled hydroxylamino-triazine (BHT) siderophores toward the quantification of iron(iii), vanadium(v) and uranium(vi) hard metal ions. *New Journal of Chemistry*, 48(34), 14884–14895. <https://doi.org/10.1039/d4nj02645d>

Bintsis, T., & Papademas, P. (2024a). Correction: Bintsis, T.; Papademas, P. The Evolution of Fermented Milks, from Artisanal to Industrial Products: A Critical Review. *Fermentation* 2022, 8, 679. *Fermentation*, 10(3), 171. <https://doi.org/10.3390/fermentation10030171>

Bintsis, T., & Papademas, P. (2024b). The Application of Protective Cultures in Cheese: A Review. *Fermentation*, 10(3), 117. <https://doi.org/10.3390/fermentation10030117>

Christou, A., Alkiviadi, A., & Goulas, V. (2024). Improving Hydroxytyrosol Derivatives Content in Virgin Olive Oil using Ultrasound-assisted Maceration with Olive Leaf Extract. *Current Bioactive Compounds*, 20(1), 21–27. <https://doi.org/10.2174/1573407219666230816091455>

Christou, A., Parisi, N. A., Tzakos, A. G., Gerothanassis, I. P., & Goulas, V. (2024). Optimization of β -cyclodextrin based ultrasound-assisted extraction: A green strategy to enhance the extraction of bioactive compounds from taro leaf byproduct. *Sustainable Chemistry and Pharmacy*, 41, 101728. <https://doi.org/10.1016/j.scp.2024.101728>

Christou, A., Stavrou, C., Michael, C., Botsaris, G., & Goulas, V. (2024a). Antibacterial and Carbohydrate Digestive Enzyme Inhibitory Effects of Native Plants Used for Medicinal and Culinary Purposes in Cyprus. *Natural Product Communications*, 19(1). <https://doi.org/10.1177/1934578X231222105>

Christou, A., Stavrou, C., Michael, C., Botsaris, G., & Goulas, V. (2024b). New Insights into the Potential Inhibitory Effects of Native Plants from Cyprus on Pathogenic Bacteria and Diabetes-Related Enzymes. *Microbiology Research*, 15(2), 926–942. <https://doi.org/10.3390/microbiolres15020061>

Christou, A., Stavrou, K., Michael, C., Botsaris, G., & Goulas, V. (2024c). Evaluation of Mediterranean Tree Leaves as Valuable Biomass of Digestive Enzymes and Bacterial Inhibitors in the Concept of Circular Bioeconomy. *Biomass (Switzerland)*, 4(2), 442–454. <https://doi.org/10.3390/biomass4020022>

Chrysargyris, A., Petrovic, J. D., Tomou, E.-M., Kyriakou, K., Xylia, P., Kotsoni, A., Gkretsi, V., Miltiadous, P., Skaltsa, H., Soković, M. D., & Tzortzakis, N. (2024). Phytochemical Profiles and Biological Activities of Plant Extracts from Aromatic Plants Cultivated in Cyprus. *Biology*, 13(1), 45. <https://doi.org/10.3390/biology13010045>

Chrysargyris, A., Prasad, M., & Tzortzakis, N. (2024). Wood-Based Biochar Ratio Used for Partial Peat Replacement in Growing Media for *Antirrhinum majus* Pot Production. *Agriculture (Switzerland)*, 14(11), 1860. <https://doi.org/10.3390/agriculture14111860>

Chrysargyris, A., & Tzortzakis, N. (2024). Residues from Medicinal and Aromatic Plants after Distillation Can Be Used in Replace Some Peat in the Growing Media for *Viola × wittrockiana* Production. *Agronomy*, 14(1), 187. <https://doi.org/10.3390/agronomy14010187>

Chrysargyris, A., Tzortzakis, N., & Aziz, A. (2024). Editorial: Bio-based compounds from plants and beneficial microbes for alleviation of biotic and abiotic stress. *Frontiers in Plant Science*, 15. <https://doi.org/10.3389/fpls.2024.1382304>

Chrysargyris, A., Xylia, P., & Tzortzakis, N. (2024a). Drying temperature and conditions affect the *Origanum dubium* Boiss. and *Salvia fruticosa* Mill. quality attributes and impact the essential oil composition, antimicrobial and antioxidant activities. *Industrial Crops and Products*, 222, 119898. <https://doi.org/10.1016/j.indcrop.2024.119898>

Chrysargyris, A., Xylia, P., & Tzortzakis, N. (2024b). Oliviculture and Viticulture Crop Byproducts Use for Peat Partial Substitution for Carnation Production. *Agronomy*, 14(3), 605. <https://doi.org/10.3390/agronomy14030605>

Chrysargyris, A., Xylia, P., Zengin, G., & Tzortzakis, N. (2024). Purslane (*Portulaca oleracea* L.) Growth, Nutritional, and Antioxidant Status under Different Nitrogen Levels in Hydroponics. *Horticulturae*, 10(9), 1007. <https://doi.org/10.3390/horticulturae10091007>

Constantinou, A., Hafeez, S., Harkou, E., Adamou, P., Pallari, E., Manos, G., Webb, A., Kotha, R., Morgen, O. v, Walls, L. E., Ríos-Solís, L., Dewil, R., & Al-Salem, S. M. (2024). Fuel Quality from Thermochemical Conversion and Biological Treatment of Biomass. *Industrial and Engineering Chemistry Research*, 63(44), 18699–18723. <https://doi.org/10.1021/acs.iecr.4c02174>

Dabbawala, A. A., al Maksoud, W., Abou-Hamad, E., Charisiou, N. D., Constantinou, A., Harkou, E., Latsiou, A. I., AlKhoori, S., Hinder, S. J., Baker, M. A., Anjum, D. H., Kobayashi, Y., Goula, M. A., & Polychronopoulou, K. (2024). Tuning of the acid sites in the zeolite-alumina composite Ni catalysts and their impact on the palm oil hydrodeoxygenation reaction. *Chemical Engineering Journal*, 493, 152351. <https://doi.org/10.1016/j.cej.2024.152351>

de Oliveira, I., Chrysargyris, A., Finimundy, T. C., Carocho, M., Santos-Buelga, C., Calhelha, R. C., Tzortzakis, N., Barros, L., & Heleno, S. A. (2024a). Magnesium and manganese induced changes on chemical, nutritional, antioxidant and

- antimicrobial properties of the pansy and Viola edible flowers. *Food Chemistry*, 438, 137976. <https://doi.org/10.1016/j.foodchem.2023.137976>
- de Oliveira, I., Chrysargyris, A., Finimundy, T. C., Caroch, M., Santos-Buelga, C., Calhelha, R. C., Tzortzakis, N., Barros, L., & Heleno, S. A. (2024b). The influence of magnesium and manganese cations on the chemical and bioactive properties of purple and green basil. *Food and Function*, 15(21), 10644–10662. <https://doi.org/10.1039/d4fo02820a>
- Deligiannis, M., Gkalipidou, E., Gatidou, G., Kostakis, M. G., Triantafyllos Gerokonstantis, D., Arvaniti, O. S., Thomaidis, N. S., Vyrides, I., Hale, S. E., Peter Arp, H., Fountoulakis, M. S., & Stasinakis, A. S. (2024). Study on the fate of per- and polyfluoroalkyl substances during thermophilic anaerobic digestion of sewage sludge and the role of granular activated carbon addition. *Bioresource Technology*, 406, 131013. <https://doi.org/10.1016/j.biortech.2024.131013>
- di Gregorio, L., Nolfi, L., Latini, A., Nikoloudakis, N., Bunnefeld, N., Notarfonso, M., Bernini, R., Manikas, I., & Bevivino, A. (2024). Getting (ECO)Ready: Does EU Legislation Integrate Up-to-Date Scientific Data for Food Security and Biodiversity Preservation Under Climate Change? *Sustainability*, 16(23), 10749. <https://doi.org/10.3390/su162310749>
- Fanariotis, A., Orphanoudakis, T., & Fotopoulos, V. (2024). Reducing the Power Consumption of Edge Devices Supporting Ambient Intelligence Applications. *Information*, 15(3), 161. <https://doi.org/10.3390/info15030161>
- Giakoumi, M., Kapnisis, K., Anayiotos, A., & Stephanou, P. S. (2024). Analytical Solutions of PBTK Models for Evaluating the Impact of Surface Diffusion Characteristics on the Leaching Profile of Implant Byproducts. *Mathematical and Computational Applications*, 29(6), 101. <https://doi.org/10.3390/mca29060101>
- Giakoumi, M., Stephanou, P. S., Kokkinidou, D., Papastefanou, C., Anayiotos, A., & Kapnisis, K. (2024). A Predictive Toxicokinetic Model for Nickel Leaching from Vascular Stents. *ACS Biomaterials Science and Engineering*, 10(4), 2534–2551. <https://doi.org/10.1021/acsbiomaterials.3c01436>
- Gkatzamani, A., Ipsilantis, I., Menexes, G., Katsiotis, A., Mattas, K., & Koukounaras, A. (2024). The Impact of Salinity in the Irrigation of a Wild Underutilized Leafy Vegetable, *Sonchus oleraceus* L. *Plants*, 13(11), 1552. <https://doi.org/10.3390/plants13111552>
- Gohari, G., Jiang, M., Manganaris, G. A., Zhou, J., & Fotopoulos, V. (2024). Next generation chemical priming: with a little help from our nanocarrier friends. *Trends in Plant Science*, 29(2), 150–166. <https://doi.org/10.1016/j.tplants.2023.11.024>
- Hadjichristodoulou, M., Papoutsas, C., Kanetis, L., Stavrinides, M., Eliades, M., & Hadjimitsis, D. (2024). An insight into remote sensing solutions for monitoring the *Xylella fastidiosa* bacterium that is threatening olive trees: a literature review. *Proceedings of SPIE - The International Society for Optical Engineering*, 13212. <https://doi.org/10.1117/12.3037289>
- Hajisolomou, E., Neofytou, G., Petropoulos, S. A., & Tzortzakis, N. (2024). The Application of Conventional and Organic Fertilizers During Wild Edible Species Cultivation: A Case Study of Purslane and Common Sowthistle. *Horticulturae*, 10(11), 1222. <https://doi.org/10.3390/horticulturae10111222>
- Hardouin, E. A., Riccioli, F., Andreou, D., Baltazar-Soares, M., Cvitanović, M., Williams, N. F., Chevret, P., Renaud, S., García-Rodríguez, O., Hadjisterkotis, E., Miltiadiou, D., Macholán, M., Odenthal-Hesse, L., Kuenzel, S., & Mitsainas, G. P. (2024). Population genetics and demography of the endemic mouse species of Cyprus, *Mus cypriacus*. *Mammalian Biology*, 104(3), 311–322. <https://doi.org/10.1007/s42991-024-00410-w>
- Ioannidou, S., Litskas, V. D., Stavrinides, M., & Vogiatzakis, I. N. (2024). The role of mixed orchards in carbon sequestration and climate change mitigation in a Mediterranean island environment. *Frontiers in Sustainable Food Systems*, 8, 1457462. <https://doi.org/10.3389/fsufs.2024.1457462>

- Jellen, E. N., Wight, C. P., Spannagl, M., Blake, V. C., Chong, J., Herrmann, M. H., Howarth, C. J., Huang, Y.-F., Juqing, J., Katsiotis, A., Tinker, N. A., & Sen, T. Z. (2024). A uniform gene and chromosome nomenclature system for oat (*Avena* spp.). *Crop and Pasture Science*, 75(1). <https://doi.org/10.1071/CP23247>
- Kamilari, E., Stanton, C., Tsaltas, D., & Ross, R. P. (2024). Regional microbial content of fermented traditional and industrial East Mediterranean sausages from the islands of Cyprus and Mytilini. *Microbiome Research Reports*, 3(4). <https://doi.org/10.20517/mrr.2024.47>
- Karachalios, T., Karachristos, C., Kouvara, T., Fanariotis, A., Fotopoulos, V., & Orphanoudakis, T. (2024). From Classroom to Sky: The Drones4STEM Initiative in Secondary Education. *IEEE Global Engineering Education Conference (EDUCON)*, 1-5. <https://doi.org/10.1109/EDUCON60312.2024.10578681>
- Karanastasi, E., Kotsantonis, V., & Pantelides, I. S. (2024). Compost-Derived Bacterial Communities Offer Promise as Biocontrol Agents against *Meloidogyne javanica* and Promote Plant Growth in Tomato. *Agriculture (Switzerland)*, 14(6), 891. <https://doi.org/10.3390/agriculture14060891>
- Kouvara, T., Fotopoulos, V., Karachristos, C., & Orphanoudakis, T. (2024). Expanding the “A” in STEAM: Integrating Poetry and AI for Educational Evolution. *IEEE Global Engineering Education Conference (EDUCON)*, 01-07. <https://doi.org/10.1109/EDUCON60312.2024.10578751>
- Kyriakaki, P., Mavrommatis, A., Mitsiopoulou, C., & Tsiplakou, E. (2024). Effect of whole sesame seeds dietary inclusion levels on transcriptional signatures of lipid metabolism in mammary gland of goats. *Small Ruminant Research*, 236, 107294. <https://doi.org/10.1016/j.smallrumres.2024.107294>
- Mazioti, A. A., & Vyrides, I. (2024). Treatment of high-strength saline bilge wastewater by four pilot-scale aerobic moving bed biofilm reactors and comparison of the microbial communities. *Environmental Technology (United Kingdom)*, 45(6), 1066–1080. <https://doi.org/10.1080/09593330.2022.2137436>
- Mettas, C., Themistocleous, K., Prodromou, M., Kountouri, J., Kalogirou, E., Evagorou, E., Tzouvaras, M., Christoforou, M., Loulli, E., Charalampous, G., Eliades, M., Pittaki, Z., Varvaris, G., Fotiou, K., Abate, D., Christofi, D., Theocharidis, C., Neophytides, St., Polydorou, T., ... Hadjimitsis, D. (2024). Synergizing airborne Hyperspectral Imaging and ground truth data for environmental monitoring: Insights from the CERAD campaign. *Proceedings of SPIE - The International Society for Optical Engineering*, 13212. <https://doi.org/10.1117/12.3037330>
- Mexias, S., Fotopoulos, V., & Giannakopoulos, K. (2024). Comparison of HC-SR04 and TF-LC02 Distance Sensors for Indoor Mapping Applications. *2024 Panhellenic Conference on Electronics and Telecommunications, PACET 2024 - Proceedings*. <https://doi.org/10.1109/PACET60398.2024.10497028>
- Michael, K., Andreou, C., Markou, A., Christoforou, M., & Nikoloudakis, N. (2024). A Novel Sorbitol-Based Flow Cytometry Buffer Is Effective for Genome Size Estimation across a Cypriot Grapevine Collection. *Plants*, 13(5), 733. <https://doi.org/10.3390/plants13050733>
- Milani, M. H., Gohari, G., Manganaris, G. A., & Fotopoulos, V. (2024). Impacts of nanocomposites on the postharvest physiology and shelf life of agricultural crops. In *Woodhead Publishing Series in Composites Science and Engineering: Nanocomposites for Environmental, Energy, and Agricultural Applications* (pp. 315–347). <https://doi.org/10.1016/B978-0-443-13935-2.00010-3>
- Mitsiopoulou, C., Fletmetakis, E., & Tsiplakou, E. (2024). Effect of whole sesame seeds on the expression of key genes in monocytes of dairy goats. *Small Ruminant Research*, 238, 107333. <https://doi.org/10.1016/j.smallrumres.2024.107333>

- Neofytou, E., Loulli, E., Papoutsas, C., Tzouvaras, M., Eliades, M., Varvaris, I., Christoforou, M., Chantzi, P., Galanis, G., Iliava, V., Zalidis, G., Mukanov, B., & Hadjimitsis, D. G. (2024). Insights from Cyprus, Greece, and North Macedonia towards the decarbonization of the agricultural sector: a quadruple helix perspective on carbon farming-data derived from a survey study. In S. C. Michaelides, D. G. Hadjimitsis, C. Danezis, N. Kyriakides, A. Christofe, K. Themistocleous, & G. Schreier (Eds.), Tenth International Conference on Remote Sensing and Geoinformation of the Environment (RSCy2024) (Vol. 13212, p. 33). SPIE. <https://doi.org/10.1117/12.3037280>
- Neofytou, E., Neophytides, S. P., Tsoumas, I., Tsalakou, A., Christoforou, M., Eliades, M., Papoutsas, C., Kontoes, C., & Hadjimitsis, D. G. (2024). Potato yield empowerment by photosynthesis, carbon assimilation, and evapotranspiration. In S. C. Michaelides, D. G. Hadjimitsis, C. Danezis, N. Kyriakides, A. Christofe, K. Themistocleous, & G. Schreier (Eds.), Tenth International Conference on Remote Sensing and Geoinformation of the Environment (RSCy2024) (Vol. 13212, p. 37). SPIE. <https://doi.org/10.1117/12.3037291>
- Neofytou, G., Chrysargyris, A., Antoniou, M. G., & Tzortzakis, N. (2024). Radish and Spinach Seedling Production and Early Growth in Response to Struvite Use as a Phosphorus Source. *Plants*, 13(20), 2917. <https://doi.org/10.3390/plants13202917>
- Neophytides, S. P., Tsoumas, I., Tsalakou, A., Christoforou, M., Mavrovouniotis, M., Eliades, M., Papoutsas, C., Kontoes, C., & Hadjimitsis, D. G. (2024). Invariant learning as a pathway to robust potato yield prediction. In C. M. Neale, A. Maltese, C. Nichol, & C. R. Bostater (Eds.), Remote Sensing for Agriculture, Ecosystems, and Hydrology XXVI (Vol. 13191, p. 20). SPIE. <https://doi.org/10.1117/12.3031554>
- Nicodemou, A., Konstantinou, D., & Koutinas, M. (2024). Enhanced biomass and lipid production from olive processing wastewater using *Scenedesmus obliquus* in a two-stage cultivation strategy under salt stress. *Biochemical Engineering Journal*, 205, 109290. <https://doi.org/10.1016/j.bej.2024.109290>
- Papademas, P., Paramithiotis, S., Aspri, M., Bintsis, T., Anagnostopoulos, D. A., & Tsaltas, D. (2024). Editorial: Microbial communities in fermented products: current knowledge and future prospects. *Frontiers in Microbiology*, 15. <https://doi.org/10.3389/fmicb.2024.1408480>
- Papanikolaou, M., Hadjithoma, S., Keramidas, O., Drouza, C., Amoiridis, A., Themistokleous, A., Hayes, S. C., Miras, H. N., Lianos, P., Tsipis, A. C., Kabanos, T. A., & Keramidas, A. D. (2024). Experimental and Theoretical Investigation of the Mechanism of the Reduction of O₂ from Air to O₂²⁻ by VIVO²⁺-N,N,N-Amidate Compounds and Their Potential Use in Fuel Cells. *Inorganic Chemistry*, 63(7), 3229–3249. <https://doi.org/10.1021/acs.inorgchem.3c03272>
- Parmaki, S., Vasquez, M. I., Patsalou, M., Gomes, R. F. A., Simeonov, S. P., Afonso, C. A. M., & Koutinas, M. (2024). Ecotoxicological assessment of biomass-derived furan platform chemicals using aquatic and terrestrial bioassays. *Environmental Science: Processes and Impacts*, 26(4), 686–699. <https://doi.org/10.1039/d3em00552f>
- Patsalou, M., Konstantinou, R., Hadjikyprianou, E., Tasiopoulos, A. J., Constantinides, G., & Koutinas, M. (2024). Starch hydrolysis using immobilized cells and enzymes of two *Aspergillus* strains on oxidized carbonaceous materials. *Industrial Crops and Products*, 222, 120069. <https://doi.org/10.1016/j.indcrop.2024.120069>
- Peratikou, S., & Charalambides, A. G. (2024). Short-term PV energy yield predictions within city neighborhoods for optimum grid management. *Energy and Buildings*, 323, 114773. <https://doi.org/10.1016/j.enbuild.2024.114773>
- Photiou, P., Constantinou, D., Papaioakeim, P., Agapiou, A., & Vyrides, I. (2024). Treatment and recovery of phosphate from submerged anaerobic membrane bioreactor effluent using thermally treated biowaste and powder activated carbon. *Journal of Environmental Management*, 351, 119712. <https://doi.org/10.1016/j.jenvman.2023.119712>
- Sabotič, J., Bayram, E., Ezra, D., Gaudêncio, S. P., Haznedaroğlu, B. Z., Janež, N., Ktari, L., Luganini, A., Mandalakis, M., Safarik, I., Simes, D., Strode, E., Toruńska-Sitarz, A., Varamogianni-Mamatsi, D., Varese, G. C., & Vasquez, M. I. (2024). A

guide to the use of bioassays in exploration of natural resources. *Biotechnology Advances*, 71, 108307. <https://doi.org/10.1016/j.biotechadv.2024.108307>

Samanides, C. G., & Vyrides, I. (2024). Effect of bicarbonate on hydrogen generation by Zero-Valent iron and its impact on generation of acetic acid by seven different inocula. *Bioresource Technology*, 406, 131004. <https://doi.org/10.1016/j.biortech.2024.131004>

Simoni, M., Danese, T., Guerra, A., Goi, A., Pitino, R., de Marchi, M., Mitsiopoulou, C., Kyriakaki, P., Mavrommatis, A., Tsiplakou, E., & Righi, F. (2024). Evaluating NIRS for predicting faecal fibre, protein fractions and digestibility in dairy sheep and goats fed alfalfa hay and concentrate. *Italian Journal of Animal Science*, 23(1), 1479–1490. <https://doi.org/10.1080/1828051X.2024.2409967>

Souroullas, K., Manoli, A., Itskos, G., Apostolou, T., & Papademas, P. (2024). Fluorescence of Intrinsic Milk Chromophores as a Novel Verification Method of UV-C Treatment of Milk. *Foods*, 13(18), 2887. <https://doi.org/10.3390/foods13182887>

Stavrou, K., Christou, A., & Goulas, V. (2024). Optimization of Green Sample Preparation for the Determination of Hydroxycinnamic Acids in Multi-Floral Honey Using Response Surface Methodology. *Applied Sciences*, 14(13), 5781. <https://doi.org/10.3390/app14135781>

Stephanou, P. S. (2024a). A model with coupled Maxwell modes using Giesekus' postulate. *Physics of Fluids*, 36(8). <https://doi.org/10.1063/5.0224127>

Stephanou, P. S. (2024b). Inconsistency between the micropolar theory and non-equilibrium thermodynamics in the case of polar fluids. *Journal of Non-Equilibrium Thermodynamics*, 49(3), 335–346. <https://doi.org/10.1515/jnet-2023-0106>

Stephanou, P. S. (2024c). Variable entanglement density constitutive rheological model for polymeric fluids. *Rheologica Acta*, 63(5), 379–395. <https://doi.org/10.1007/s00397-024-01444-0>

Syranidou, E., Pyrilli, F., Fountoulakis, A., Constantinides, G., Kalogerakis, N., & Koutinas, M. (2024). Biodegradation of thermoplastic starch by a newly isolated active microbial community: Deciphering the biochemical mechanisms controlling bioprocess robustness. *Chemical Engineering Journal*, 499, 155957. <https://doi.org/10.1016/j.cej.2024.155957>

Taheri-Garavand, A., Beiranvandi, M., Ahmadi, A., & Nikoloudakis, N. (2024). Predictive modeling of Satureja rechingeri essential oil yield and composition under water deficit and soil amendment conditions using artificial neural networks (ANNs). *Computers and Electronics in Agriculture*, 222, 109072. <https://doi.org/10.1016/j.compag.2024.109072>

Tourapi, C., Christoforou, E., Gaudêncio, S. P., & Vasquez, M. I. (2024). Aquatic Biomaterial Repositories: Comprehensive Guidelines, Recommendations, and Best Practices for Their Development, Establishment, and Sustainable Operation. *Marine Drugs*, 22(9), 427. <https://doi.org/10.3390/md22090427>

Tzortzakis, N. (2024). Origanum dictamnus Essential Oil in Vapour or Aqueous Solution Application for Pepper Fruit Preservation against Botrytis cinerea. *Agronomy*, 14(2), 257. <https://doi.org/10.3390/agronomy14020257>

Tzortzakis, N., & Chrysargyris, A. (2024). Olive-mill and grape-mill residue impact the growth, physiology and nutrient status of grapevines young cuttings. *Sustainable Chemistry and Pharmacy*, 37, 101362. <https://doi.org/10.1016/j.scp.2023.101362>

Varvaris, I., Themistocleous, K., Pittaki, Z., Christoforou, M., Eliades, M., Chantzi, P., Evagorou, E., Mettas, C., Zalidis, G., & Hadjimitsis, D. (2024). Review on Quintuple Helix Innovation Model and Introducing Co-Eco-Approach in Support of Climate Change Mitigation and Adaptation within the Framework of the New European Bauhaus Initiative.

Venianakis, T., Parisis, N., Christou, A., Goulas, V., Nikoloudakis, N., Botsaris, G., Goričan, T., Grdadolnik, S. G., Tzakos, A. G., & Gerothanassis, I. P. (2024). Phytochemical Analysis and Biological Evaluation of Carob Leaf (*Ceratonia siliqua* L.) Crude Extracts Using NMR and Mass Spectroscopic Techniques. *Molecules*, 29(22), 5273. <https://doi.org/10.3390/molecules29225273>

Vogiatzakis, I. N., & Stavrinos, M. C. (2024). Giving nature half of Cyprus: The quest for conservation allies. *Journal for Nature Conservation*, 82, 126748. <https://doi.org/10.1016/j.jnc.2024.126748>

Wissner, J. L., Almeida, J. R., Grilo, I. R., Oliveira, J. F., Brízida, C., Escobedo-Hinojosa, W., Pissaridou, P., Vasquez, M. I., Cunha, I., Sobral, R. G., Vasconcelos, V., & Gaudêncio, S. P. (2024). Novel metabolite madeirone and neomarinone extracted from *Streptomyces aculeoletus* as marine antibiofilm and antifouling agents. *Frontiers in Chemistry*, 12. <https://doi.org/10.3389/fchem.2024.1425953>

Xylia, P., Chrysargyris, A., Tomou, E.-M., Goumenos, C., Skaltsa, H., & Tzortzakis, N. (2024). Quality Characteristics and Essential Oil Properties of *Thymus capitatus*, *Mentha piperita*, and *Sideritis cypria* Dried under Different Conditions. *Plants*, 13(22), 3150. <https://doi.org/10.3390/plants13223150>

Xylia, P., Chrysargyris, A., & Tzortzakis, N. (2024a). *Origanum dubium* Boiss. (Cypriot oregano) Use for the Preservation of Fresh Spearmint Quality and Safety. *Agronomy*, 14(6), 1252. <https://doi.org/10.3390/agronomy14061252>

Xylia, P., Chrysargyris, A., & Tzortzakis, N. (2024b). The Postharvest Safety and Quality of Fresh Basil as Affected by the Use of Cypriot Oregano (*Origanum dubium*) Extracts. *Horticulturae*, 10(2), 159. <https://doi.org/10.3390/horticulturae10020159>

2023

Adamou, P., Bellomi, S., Hafeez, S., Harkou, E., Al-Salem, S. M., Villa, A., Dimitratos, N., Manos, G., & Constantinou, A. (2023). Recent progress for hydrogen production from ammonia and hydrous hydrazine decomposition: A review on heterogeneous catalysts. *Catalysis Today*, 423, 114022. <https://doi.org/10.1016/j.cattod.2023.01.029>

Adamou, P., Harkou, E., Hafeez, S., Manos, G., Villa, A., Al-Salem, S. M., Constantinou, A., & Dimitratos, N. (2023). Recent progress on sonochemical production for the synthesis of efficient photocatalysts and the impact of reactor design. *Ultrasonics Sonochemistry*, 100, 106610. <https://doi.org/10.1016/j.ultsonch.2023.106610>

Alejandre, E. M., Scherer, L., Guinée, J. B., Aizen, M. A., Albrecht, M., Balzan, M. v., Bartomeus, I., Bevk, D., Burkle, L. A., Clough, Y., Cole, L. J., Delphia, C. M., Dicks, L. v., Garratt, M. P., Kleijn, D., Kovács-Hostyánszki, A., Mandelik, Y., Paxton, R. J., Petanidou, T., ... van Bodegom, P. M. (2023). Characterization Factors to Assess Land Use Impacts on Pollinator Abundance in Life Cycle Assessment. *Environmental Science and Technology*, 57(8), 3445–3454. <https://doi.org/10.1021/acs.est.2c05311>

Andreou, C., Tselios, C., Ioannou, A., & Varotsis, C. (2023). Probing the Fucoxanthin-Chlorophyll a/c-Binding Proteins (FCPs) of the Marine Diatom *Fragilariopsis* sp. by Resonance Raman Spectroscopy. *Journal of Physical Chemistry B*, 127(42), 9014–9020. <https://doi.org/10.1021/acs.jpccb.3c04346>

Aspri, M., Mustač, N. Č., & Tsaltas, D. (2023). Non-cereal and Legume Based Sourdough Metabolites. In *Sourdough Innovations* (pp. 63–86). CRC Press. <https://doi.org/10.1201/9781003141143-4>

- Aspri, M., & Tsaltas, D. (2023). Major Classes of Sourdough Enzymes. In *Sourdough Innovations* (pp. 147–160). CRC Press. <https://doi.org/10.1201/9781003141143-8>
- Bintsis, T., & Papademas, P. (2023). Sustainable Approaches in Whey Cheese Production: A Review. *Dairy*, 4(2), 249–270. <https://doi.org/10.3390/dairy4020018>
- Charalambous, I., Ioannou, N., Kyratzis, A. C., Kourtellarides, D., Hagidimitriou, M., & Nikoloudakis, N. (2023). Genome Size Variation across a Cypriot Fabeae Tribe Germplasm Collection. *Plants*, 12(7), 1469. <https://doi.org/10.3390/plants12071469>
- Charalambous, P., Constantinou, D., Samanides, C. G., & Vyrides, I. (2023). Enhancing biogas production from cheese whey using Zero-Valent Iron: A comparative analysis of batch and semi-continuous operation modes. *Journal of Environmental Chemical Engineering*, 11(6), 111278. <https://doi.org/10.1016/j.jece.2023.111278>
- Chiquillo, K. L., Barber, P. H., Vasquez, M. I., Cruz-Rivera, E., Willette, D. A., Winters, G., & Fong, P. (2023). An invasive seagrass drives its own success in two invaded seas by both negatively affecting native seagrasses and benefiting from those costs. *Oikos*, 2023(3). <https://doi.org/10.1111/oik.09403>
- Christophe, S., Pentieva, K., & Botsaris, G. (2023). Knowledge and Practices of Cypriot Bovine Farmers towards Effective and Safe Manure Management. *Veterinary Sciences*, 10(4), 293. <https://doi.org/10.3390/vetsci10040293>
- Christou, A., Parisis, N. A., Venianakis, T., Barbouti, A., Tzakos, A. G., Gerathanassis, I. P., & Goulas, V. (2023). Ultrasound-Assisted Extraction of Taro Leaf Antioxidants Using Natural Deep Eutectic Solvents: An Eco-Friendly Strategy for the Valorization of Crop Residues. *Antioxidants*, 12(10), 1801. <https://doi.org/10.3390/antiox12101801>
- Chrysargyris, A., Goumenos, C., & Tzortzakis, N. (2023). Use of Medicinal and Aromatic Plant Residues for Partial Peat Substitution in Growing Media for *Sonchus oleraceus* Production. *Agronomy*, 13(4), 1074. <https://doi.org/10.3390/agronomy13041074>
- Chrysargyris, A., Hajisolomou, E., Xylia, P., & Tzortzakis, N. (2023a). Ammonium to total nitrogen ratio affects the purslane (*Portulaca oleracea* L.) growth, nutritional, and antioxidant status. *Heliyon*, 9(11), e21644. <https://doi.org/10.1016/j.heliyon.2023.e21644>
- Chrysargyris, A., Hajisolomou, E., Xylia, P., & Tzortzakis, N. (2023b). Olive-mill and grape-mill waste as a substitute growing media component for unexploded vegetables production. *Sustainable Chemistry and Pharmacy*, 31, 100940. <https://doi.org/10.1016/j.scp.2022.100940>
- Chrysargyris, A., Louka, S., Petropoulos, S. A., & Tzortzakis, N. (2023). Soilless Cultivation of *Portulaca oleracea* Using Medicinal and Aromatic Plant Residues for Partial Peat Replacement. *Horticulturae*, 9(4), 474. <https://doi.org/10.3390/horticulturae9040474>
- Chrysargyris, A., Maggini, R., Incrocci, L., Pardossi, A., & Tzortzakis, N. (2023). Copper and Zinc Accumulation in Young Leaves of *Eruca sativa* (L.) Grown in Soilless Culture. *Horticulturae*, 9(9), 976. <https://doi.org/10.3390/horticulturae9090976>
- Chrysargyris, A., Tomou, E.-M., Goula, K., Dimakopoulou, K., Tzortzakis, N., & Skaltsa, H. (2023). *Sideritis* L. essential oils: A systematic review. *Phytochemistry*, 209, 113607. <https://doi.org/10.1016/j.phytochem.2023.113607>

- Chrysargyris, A., & Tzortzakis, N. (2023). Optimising fertigation of hydroponically grown sowthistle (*Sonchus oleraceus* L.): The impact of the nitrogen source and supply concentration. *Agricultural Water Management*, 289, 108528. <https://doi.org/10.1016/j.agwat.2023.108528>
- Constantinou, D., Samanides, C. G., Koutsokeras, L., Constantinides, G., & Vyrides, I. (2023). Hydrogen generation by soluble CO₂ reaction with zero-valent iron or scrap iron and the role of weak acids for controlling FeCO₃ formation. *Sustainable Energy Technologies and Assessments*, 56, 103061. <https://doi.org/10.1016/j.seta.2023.103061>
- Danezis, C., Kakoullis, D., Fotiou, K., Pekri, M., Chatzinikos, M., Kotsakis, C., Brcic, R., Eineder, M., Nikolaidis, M., Ioannou, G., Christofe, A., Kyriakides, N., Melillos, G., Christoforou, M., Tzouvaras, M., Pilidou, S., Themistocleous, K., & Hadjimitsis, D. (2023). CyCLOPS: A National Integrated GNSS/InSAR Strategic Research Infrastructure for Monitoring Geohazards and Forming the Next Generation Datum of the Republic of Cyprus. *International Association of Geodesy Symposia*, 154, 289–302. https://doi.org/10.1007/1345_2022_161
- de Oliveira, I., Chrysargyris, A., Heleno, S. A., Carocho, M., Calhelha, R. C., Dias, M. I., Petrović, J., Soković, M., Petropoulos, S. A., Santos-Buelga, C., Tzortzakis, N., & Barros, L. (2023). Effects of the extraction techniques on the chemical composition and bioactive properties of lemon balm (*Melissa officinalis* L.) plants grown under different cropping and irrigation regimes. *Food Research International*, 170, 113044. <https://doi.org/10.1016/j.foodres.2023.113044>
- Eroldoğan, O. T., Glencross, B., Novoveska, L., Gaudêncio, S. P., Rinkevich, B., Varese, G. C., de Fátima Carvalho, M., Tasdemir, D., Safarik, I., Nielsen, S. L., Rebours, C., Lada, L. B., Robbins, J., Strode, E., Haznedaroğlu, B. Z., Kotta, J., Evliyaoğlu, E., Oliveira, J., Girão, M., ... Rotter, A. (2023). From the sea to aquafeed: A perspective overview. *Reviews in Aquaculture*, 15(3), 1028–1057. <https://doi.org/10.1111/raq.12740>
- Fanariotis, A., Orphanoudakis, T., Kotrotsios, K., Fotopoulos, V., Keramidas, G., & Karkazis, P. (2023). Power Efficient Machine Learning Models Deployment on Edge IoT Devices. *Sensors*, 23(3), 1595. <https://doi.org/10.3390/s23031595>
- Georgiadou, E. C., Mina, M., Neoptoleμου, V., Koundouras, S., D'Onofrio, C., Bellincontro, A., Mencarelli, F., Fotopoulos, V., & Manganaris, G. A. (2023). The beneficial effect of leaf removal during fruit set on physiological, biochemical, and qualitative indices and volatile organic compound profile of the Cypriot reference cultivar 'Xynisteri.' *Journal of the Science of Food and Agriculture*, 103(8), 3776–3786. <https://doi.org/10.1002/jsfa.12268>
- Giakoumi, M., Stephanou, P. S., Kapnisis, K., & Anayiotos, A. (2023). On the development of physiologically based toxicokinetic (PBTK) models for cardiovascular implants. *Regulatory Toxicology and Pharmacology*, 144, 105489. <https://doi.org/10.1016/j.yrtph.2023.105489>
- Giamouri, E., Zisis, F., Mitsiopoulou, C., Christodoulou, C., Pappas, A. C., Simitzis, P. E., Kamilaris, C., Galliou, F., Manios, T., Mavrommatis, A., & Tsiplakou, E. (2023). Sustainable Strategies for Greenhouse Gas Emission Reduction in Small Ruminants Farming. *Sustainability*, 15(5), 4118. <https://doi.org/10.3390/su15054118>
- Goudarzi, H., Koutsokeras, L., Balawi, A. H., Sun, C., Manolis, G. K., Gasparini, N., Peisen, Y., Antoniou, G., Athanasopoulos, S., Tselios, C. C., Falaras, P., Varotsis, C., Laquai, F., Cabanillas-González, J., & Keivanidis, P. E. (2023). Microstructure-driven annihilation effects and dispersive excited state dynamics in solid-state films of a model sensitizer for photon energy up-conversion applications. *Chemical Science*, 14(8), 2009–2023. <https://doi.org/10.1039/d2sc06426j>
- Griffiths, N. P., Wright, R. M., Hänfling, B., Bolland, J. D., Drakou, K., Sellers, G. S., Zogaris, S., Tziortzis, I., Dörflinger, G., & Vasquez, M. I. (2023). Integrating environmental DNA monitoring to inform eel (*Anguilla anguilla*) status in

- freshwaters at their easternmost range—A case study in Cyprus. *Ecology and Evolution*, 13(2). <https://doi.org/10.1002/ece3.9800>
- Hafeez, S., Harkou, E., Adamou, P., Barlocco, I., Zanella, E., Manos, G., Al-Salem, S. M., Chen, X., Delgado, J. J., Dimitratos, N., Villa, A., & Constantinou, A. (2023). Formic Acid Decomposition Using Palladium-Zinc Preformed Colloidal Nanoparticles Supported on Carbon Nanofibre in Batch and Continuous Flow Reactors: Experimental and Computational Fluid Dynamics Modelling Studies. *Nanomaterials*, 13(23), 2993. <https://doi.org/10.3390/nano13232993>
- Hafeez, S., van Haute, M., Constantinou, A., & Al-Salem, S. M. (2023). Process Simulation Modeling of the Linear Low-Density Polyethylene Catalytic Pyrolysis in a Fluidized Bed Reactor. *Industrial and Engineering Chemistry Research*, 62(16), 6386–6393. <https://doi.org/10.1021/acs.iecr.2c04379>
- Hafeez, S., van Haute, M., Manos, G., Karam, H. J., Constantinou, A., & Al-Salem, S. M. (2023). Hydrotreatment over the Pt/Al₂O₃ Catalyst of Polyethylene-Derived Pyrolysis Oil and Wax. *Energy and Fuels*, 37(20), 16181–16185. <https://doi.org/10.1021/acs.energyfuels.3c03152>
- Harkou, E., Adamou, P., Georgiou, K., Hafeez, S., Al-Salem, S. M., Villa, A., Manos, G., Dimitratos, N., & Constantinou, A. (2023). Computational Studies on Microreactors for the Decomposition of Formic Acid for Hydrogen Production Using Heterogeneous Catalysts. *Molecules*, 28(14), 5399. <https://doi.org/10.3390/molecules28145399>
- Harkou, E., Hafeez, S., Adamou, P., Zhang, Z., Tsiotsias, A. I., Charisiou, N. D., Goula, M. A., Al-Salem, S. M., Manos, G., & Constantinou, A. (2023). Different reactor configurations for enhancement of CO₂ methanation. *Environmental Research*, 236, 116760. <https://doi.org/10.1016/j.envres.2023.116760>
- Iliopoulou, A., Arvaniti, O. S., Deligiannis, M., Gatidou, G., Vyrides, I., Fountoulakis, M. S., & Stasinakis, A. S. (2023). Combined use of strictly anaerobic MBBR and aerobic MBR for municipal wastewater treatment and removal of pharmaceuticals. *Journal of Environmental Management*, 343, 118211. <https://doi.org/10.1016/j.jenvman.2023.118211>
- Ioannou, A. K., & Stephanou, P. S. (2023). Nonequilibrium thermodynamics modeling of the rheological response of cement pastes. *Journal of Rheology*, 67(4), 849–861. <https://doi.org/10.1122/8.0000643>
- Jafari, S., Mousavi-Fard, S., Rezaei Nejad, A., Mumivand, H., Sorkheh, K., & Nikoloudakis, N. (2023). Foliar application of chitosan and titanium dioxide enhances silybin content by orchestrating miRNA and gene targets transcription in Milk thistle (*Silybum marianum* L.). *Current Plant Biology*, 35–36, 100302. <https://doi.org/10.1016/j.cpb.2023.100302>
- Kamilari, E., Anagnostopoulos, D. A., & Tsaltas, D. (2023). Fermented table olives from Cyprus: Microbiota profile of three varieties from different regions through metabarcoding sequencing. *Frontiers in Microbiology*, 13, 1101515. <https://doi.org/10.3389/fmicb.2022.1101515>
- Katsounotou, M., Xenofontos, E., & Tsaltas, D. (2023). Traditional Breads from Cyprus. The “Arkatena.” In *Traditional European Breads: An Illustrative Compendium of Ancestral Knowledge and Cultural Heritage* (pp. 97–114). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-031-23352-4_5
- Konstantinou, P. C., & Stephanou, P. S. (2023). Predicting High-Density Polyethylene Melt Rheology Using a Multimode Tube Model Derived Using Non-Equilibrium Thermodynamics. *Polymers*, 15(15), 3322. <https://doi.org/10.3390/polym15153322>

- Kouvara, T., Fanariotis, A., Fotopoulos, V., Karachristos, C., & Orphanoudakis, T. (2023). Why Re-Focus on IoT in Education? Evidence of the PARADIGM Project. 2023 IEEE Frontiers in Education Conference (FIE), 01-09. <https://doi.org/10.1109/FIE58773.2023.10343223>
- Kylili, A., Koutinas, M., Georgali, P.-Z., & Fokaides, P. A. (2023). Lignin valorisation: Life Cycle Assessment (LCA) considerations for enabling Circular Bioeconomy. *International Journal of Sustainable Energy*, 42(1), 1008–1027. <https://doi.org/10.1080/14786451.2023.2250869>
- Kyriakou, M., Christodoulou, M., Ioannou, A., Fotopoulos, V., & Koutinas, M. (2023). Improvement of stress multi-tolerance and bioethanol production by *Saccharomyces cerevisiae* immobilised on biochar: Monitoring transcription from defence-related genes. *Biochemical Engineering Journal*, 195, 108914. <https://doi.org/10.1016/j.bej.2023.108914>
- Manganaris, G. A., Costa, G., & Crisosto, C. H. (2023). Peach and Nectarine. In G. A. Manganaris, G. Costa, & C. Crisosto (Eds.), *Peach*. CABI. <https://doi.org/10.1079/9781789248456.0000>
- Manganaris, G. A., Gradziel, T. M., Christofi, M., & Crisosto, C. H. (2023). The peach canning industry. In *Peach* (pp. 421–436). <https://doi.org/10.1079/9781789248456.0015>
- Manganaris, G. A., Sansavini, S., Gradziel, T. M., Bassi, D., & Crisosto, C. H. (2023). Peach: An introduction. In *Peach* (pp. 1–16). <https://doi.org/10.1079/9781789248456.0001>
- Manganaris, G. A., Vicente, A. R., Echeverría, G., & Crisosto, C. H. (2023). Postharvest supply-chain management protocols and handling of physiological disorders. In *Peach* (pp. 206–225). <https://doi.org/10.1079/9781789248456.0010>
- Melito, S., Ronga, D., Marceddu, D., Kallikazarou, N. I., Antoniou, M. G., & Giannini, V. (2023). Organo-mineral Fertilizer Containing Struvite from Liquid Digestate for Cucurbita pepo L. Seedling Production. *Journal of Soil Science and Plant Nutrition*, 23(4), 6707–6720. <https://doi.org/10.1007/s42729-023-01524-9>
- Naziri, E., Papadaki, E., Savvidis, I., Botsaris, G., Gkatzionis, K., Mugampoza, E., & Mantzouridou, F. T. (2023). Exploring the Potential of Halloumi Second Cheese Whey for the Production of Lactic Acid Cultures for the Dairy Industry. *Sustainability*, 15(11), 9082. <https://doi.org/10.3390/su15119082>
- Neofytou, M. C., Hager-Theodorides, A.-L., Sfakianaki, E., Simitzis, P., Symeou, S., Sparaggis, D., Tzamaloukas, O., & Miltiadou, D. (2023). The Dietary Inclusion of Ensiled Olive Cake Increases Unsaturated Lipids in Milk and Alters the Expression of Lipogenic Genes in Mammary and Adipose Tissue in Goats. *Animals*, 13(21), 3418. <https://doi.org/10.3390/ani13213418>
- Nicodemou, A., Kallis, M., & Koutinas, M. (2023). Biorefinery development for the production of polyphenols, algal biomass and lipids using olive processing industry waste. *Sustainable Chemistry and Pharmacy*, 32, 100998. <https://doi.org/10.1016/j.scp.2023.100998>
- Novoveská, L., Nielsen, S. L., Eroldoğan, O. T., Haznedaroglu, B. Z., Rinkevich, B., Fazi, S., Robbens, J., Vasquez, M., & Einarsson, H. (2023). Overview and Challenges of Large-Scale Cultivation of Photosynthetic Microalgae and Cyanobacteria. *Marine Drugs*, 21(8), 445. <https://doi.org/10.3390/md21080445>
- Pantelides, I. S., Stringlis, I. A., Finkel, O. M., & Mercado-Blanco, J. (2023). Editorial: Organic amendments: microbial communities and their role in plant fitness and disease suppression. *Frontiers in Plant Science*, 14. <https://doi.org/10.3389/fpls.2023.1213092>

- Papachristoforou, A., Prodromou, M., Hadjimitsis, D., & Christoforou, M. (2023). Detecting and distinguishing between apicultural plants using UAV multispectral imaging. *PeerJ*, 11, e15065. <https://doi.org/10.7717/peerj.15065>
- Papademas, P., Ioannou, I., & Aspri, M. (2023). Enrichment of Fermented Milk Drinks with *Mespilus germanica* and *Crataegus azarolus* Fruit Extracts. *Applied Sciences*, 13(16), 9243. <https://doi.org/10.3390/app13169243>
- Papademas, P., Neokleous, I., & Mousikos, P. (2023). Thermal processing of equine milk – A review. *International Dairy Journal*, 138, 105541. <https://doi.org/10.1016/j.idairyj.2022.105541>
- Papageorgiou, M., Goliomytis, M., Tzamaloukas, O., Miltiadou, D., & Simitzis, P. (2023). Positive Welfare Indicators and Their Association with Sustainable Management Systems in Poultry. *Sustainability (Switzerland)*, 15(14), 10890. <https://doi.org/10.3390/su151410890>
- Pappas, A. C., Charisi, A., Chatziantoniou, C.-M., Giamouri, E., Mitsiopoulou, C., Moschopoulos, V., Christodoulou, C., Papadomichelakis, G., Kotsampasi, B., Mitsopoulos, I. K., Tsiplakou, E., & Bampidis, V. A. (2023). Effects of dietary pomegranate seed oil addition to diets for laying hens on fatty acid profile of eggs. *Animal Feed Science and Technology*, 300, 115643. <https://doi.org/10.1016/j.anifeedsci.2023.115643>
- Parmaki, S., Esteves, T., Gonçalves, J. M. J., Catenacci, A., Malpei, F., Ferreira, F. C., Afonso, C. A. M., & Koutinas, M. (2023). Selective microbial resolution of lupanine racemate: Bioprocess development and the impact of carbon catabolite repression on industrial wastewater valorisation. *Biomass Conversion and Biorefinery*, 13(16), 14949–14961. <https://doi.org/10.1007/s13399-022-03383-3>
- Photiou, P., Poulizou, M., & Vyrides, I. (2023). Recovery of phosphates from anaerobic MBR effluent using columns of eggshell and seagrass residues and their final use as a fertilizer. *Sustainable Chemistry and Pharmacy*, 33, 101039. <https://doi.org/10.1016/j.scp.2023.101039>
- Pires, E. D. O., di Gioia, F., Roupheal, Y., García-Caparrós, P., Tzortzakis, N., Ferreira, I. C. F. R., Barros, L., Petropoulos, S. A., & Caleja, C. (2023). Edible flowers as an emerging horticultural product: A review on sensorial properties, mineral and aroma profile. *Trends in Food Science and Technology*, 137, 31–54. <https://doi.org/10.1016/j.tifs.2023.05.007>
- Platis, D. P., Papoui, E., Bantis, F., Katsiotis, A., Koukounaras, A., Mamolos, A. P., & Mattas, K. (2023). Underutilized Vegetable Crops in the Mediterranean Region: A Literature Review of Their Requirements and the Ecosystem Services Provided. *Sustainability (Switzerland)*, 15(6), 4921. <https://doi.org/10.3390/su15064921>
- Prvulović, D., Gvozdenac, S., Latković, D., Peić Tukuljac, M., Sikora, V., Kiproovski, B., Mišan, A., Chrysargyris, A., Tzortzakis, N., & Ovuka, J. (2023). Phytotoxic and Insecticidal Activity of Industrial Hemp (*Cannabis sativa* L.) Extracts against *Plodia interpunctella* Hübner—A Potential Sunflower Grain Protectant. *Agronomy*, 13(10), 2456. <https://doi.org/10.3390/agronomy13102456>
- Reverté, S., Miličić, M., Ačanski, J., Andrić, A., Aracil, A., Aubert, M., Balzan, M. v, Bartomeus, I., Bogusch, P., Bosch, J., Budrys, E., Cantú-Salazar, L., Castro, S., Cornalba, M., Demeter, I., Devalez, J., Dorchin, A., Dufrêne, E., Đorđević, A., ... Vujić, A. (2023). National records of 3000 European bee and hoverfly species: A contribution to pollinator conservation. *Insect Conservation and Diversity*, 16(6), 758–775. <https://doi.org/10.1111/icad.12680>
- Rotini, A., Conte, C., Winters, G., Vasquez, M. I., & Migliore, L. (2023). Undisturbed *Posidonia oceanica* meadows maintain the epiphytic bacterial community in different environments. *Environmental Science and Pollution Research*, 30(42), 95464–95474. <https://doi.org/10.1007/s11356-023-28968-x>

- Samanides, C. G., & Vyrides, I. (2023). CO₂ conversion to volatile fatty acids by anaerobic granular sludge and MgO. *Biochemical Engineering Journal*, 191, 108799. <https://doi.org/10.1016/j.bej.2022.108799>
- Sawva, P. G., Fessas, Y., Efstathiou, A. M., & Costa, C. N. (2023). Development of a Novel De-NO_x Technology for the Aftertreatment of Ship Exhaust Gases. *Applied Sciences (Switzerland)*, 13(20), 11356. <https://doi.org/10.3390/app132011356>
- Schneider, X. T., Stroil, B. K., Tourapi, C., Rebours, C., Novoveska, L., Vasquez, M. I., & Gaudêncio, S. P. (2023). Improving awareness, understanding, and enforcement of responsibilities and regulations in Blue Biotechnology. *Trends in Biotechnology*, 41(11), 1327–1331. <https://doi.org/10.1016/j.tibtech.2023.05.011>
- Stephanou, P. S. (2023). Quantifying the oscillatory behavior in start-up shear by analytically solving the Johnson-Segalman/Gordon-Schowalter model. *Journal of Non-Newtonian Fluid Mechanics*, 312, 104966. <https://doi.org/10.1016/j.jnnfm.2022.104966>
- Stephanou, P. S., Georgantopoulos, C. K., Causa, A., & Wilhelm, M. (2023). Modeling the rheological behavior of silica filled rubber compounds. *Physics of Fluids*, 35(11). <https://doi.org/10.1063/5.0177381>
- Stephanou, P. S., Vafeas, P., & Mavrantzas, V. G. (2023). Non-equilibrium thermodynamics modelling of the stress-strain relationship in soft two-phase elastic-viscoelastic materials. *Journal of Non-Equilibrium Thermodynamics*, 48(1), 91–105. <https://doi.org/10.1515/jnet-2022-0069>
- Stylianou, M., G. Samanides, C., Vyrides, I., & Agapiou, A. (2023). High biodesulfurization efficiency of oil by aerobic (*Burkholderia* sp. and *Serratia* sp.) and anaerobic bacteria using various additives. *Energy*, 282, 128950. <https://doi.org/10.1016/j.energy.2023.128950>
- Tarapoulouzi, M., Mironescu, M., Drouza, C., Mironescu, I. D., & Agriopoulou, S. (2023). Insight into the Recent Application of Chemometrics in Quality Analysis and Characterization of Bee Honey during Processing and Storage. *Foods*, 12(3), 473. <https://doi.org/10.3390/foods12030473>
- Tedeschi, T., Aspri, M., Loffi, C., Dellafiora, L., Galaverna, G., & Papademas, P. (2023). Processing of raw donkey milk by pasteurisation and UV-C to produce freeze-dried milk powders: The effect on protein quality, digestibility and bioactive properties. *LWT*, 173, 114404. <https://doi.org/10.1016/j.lwt.2022.114404>
- Tsiotsias, A. I., Hafeez, S., Charisiou, N. D., Al-Salem, S. M., Manos, G., Constantinou, A., AlKhoori, S., Sebastian, V., Hinder, S. J., Baker, M. A., Polychronopoulou, K., & Goula, M. A. (2023). Selective catalytic deoxygenation of palm oil to produce green diesel over Ni catalysts supported on ZrO₂ and CeO₂-ZrO₂: Experimental and process simulation modelling studies. *Renewable Energy*, 206, 582–596. <https://doi.org/10.1016/j.renene.2023.02.038>
- Tsiouni, M., Kountios, G., Kousenidis, K., Kousenidis, D., Tzamaloukas, O., & Simitzis, P. (2023). Financial Ratio Analysis as an Advisory Tool for Sustainable Pig Farm Management in Greece. *Sustainability (Switzerland)*, 15(21), 15536. <https://doi.org/10.3390/su152115536>
- Tsipa, A., Papalli, M., Christou, A., Pissaridou, P., & Vasquez, M. I. (2023). Ex-situ biological treatment of industrial saline seafood wastewater by salt-tolerant mixed cultures and phytotoxicity evaluation. *Journal of Environmental Chemical Engineering*, 11(1), 109195. <https://doi.org/10.1016/j.jece.2022.109195>
- Tzanidakis, C., Tzamaloukas, O., Simitzis, P., & Panagakis, P. (2023). Precision Livestock Farming Applications (PLF) for Grazing Animals. *Agriculture*, 13(2), 288. <https://doi.org/10.3390/agriculture13020288>

- Varnava, A. I., Manganaris, G. A., & Stavrinides, M. C. (2023). Assessing the biodiversity and the impact of pollinators on carob production. *PLOS ONE*, 18(10), e0291431. <https://doi.org/10.1371/journal.pone.0291431>
- Vasquez, M. I., Notarides, G., Meletiou, S., Patsoula, E., Kavran, M., Michaelakis, A., Bellini, R., Toumazi, T., Bouyer, J., & Petrić, D. (2023). Two invasions at once: update on the introduction of the invasive species *Aedes aegypti* and *Aedes albopictus* in Cyprus " a call for action in Europe. *Parasite*, 30, 41. <https://doi.org/10.1051/parasite/2023043>
- Xylia, P., Goumenos, C., Tzortzakis, N., & Chrysargyris, A. (2023). Application of Lavender and Rosemary Essential Oils (EOs), Their Mixture and Eucalyptol (EOs Main Compound) on Cucumber Fruit Quality Attributes and Microbial Load. *Agronomy*, 13(10), 2493. <https://doi.org/10.3390/agronomy13102493>
- Yan, Y., Kallikazarou, N. I., Tzenos, C., Kotsopoulos, T. A., Koutsokeras, L., Kokkinidou, D., Michael, C., Constantinides, G., Anayiotos, A. S., Botsaris, G., Nisiforou, O., Antoniou, M. G., & Fotidis, I. A. (2023). Pilot-scale biogas and in-situ struvite production from pig slurry: A novel integrated approach. *Journal of Cleaner Production*, 431, 139656. <https://doi.org/10.1016/j.jclepro.2023.139656>
- Yuan, C., Pan, Z., Wang, Y., Baena-Moreno, F. M., Constantinou, A., & Zhang, Z. (2023). Carbon Capture Enhancement by Water-Based Nanofluids in a Hollow Fiber Membrane Contactor. *Energy Technology*, 11(8), 2300254. <https://doi.org/10.1002/ente.202300254>
- Zafeiropoulos, V., Anastassakis, G., Orphanoudakis, T., Kalles, D., Fanariotis, A., & Fotopoulos, V. (2023). The V-Lab VR Educational Application Framework. *Proceedings of the 25th International Conference on Mobile Human-Computer Interaction*, 1–4. <https://doi.org/10.1145/3565066.3608246>
- Zisis, F., Giamouri, E., Mitsiopolou, C., Christodoulou, C., Kamilaris, C., Mavrommatis, A., Pappas, A. C., & Tsiplakou, E. (2023). An Overview of Poultry Greenhouse Gas Emissions in the Mediterranean Area. *Sustainability (Switzerland)*, 15(3), 1941. <https://doi.org/10.3390/su15031941>

2022

- Aldhanhani, A. R. H., Ahmed, Z. F. R., Tzortzakis, N., & Singh, Z. (2022). Maturity stage at harvest influences antioxidant phytochemicals and antibacterial activity of jujube fruit (*Ziziphus mauritiana* Lamk. and *Ziziphus spina-christi* L.). *Annals of Agricultural Sciences*, 67(2), 196–203. <https://doi.org/10.1016/j.aoas.2022.12.003>
- Al-Salem, S. M., Alosairi, Y., & Constantinou, A. (2022). Effect of COVID-19 lockdown measures on the plastic waste generation trends and distribution of microplastics in the Northwestern Arabian/Persian Gulf. *Ocean and Coastal Management*, 216, 105979. <https://doi.org/10.1016/j.ocecoaman.2021.105979>
- Al-Salem, S. M., Leeke, G. A., El-Eskandarany, M. S., van Haute, M., Constantinou, A., Dewil, R., & Baeyens, J. (2022). On the implementation of the circular economy route for E-waste management: A critical review and an analysis for the case of the state of Kuwait. *Journal of Environmental Management*, 323, 116181. <https://doi.org/10.1016/j.jenvman.2022.116181>
- Al-Salem, S. M., van Haute, M., Karam, H. J., Hakeem, A., Meuldermans, W., Patel, J., Hafeez, S., Manos, G., & Constantinou, A. (2022). Fuel Range Properties of Oil and Wax Obtained from Catalytic Pyrolysis of Linear Low-Density Polyethylene in a Fluidized Bed Reactor (FBR). *Industrial and Engineering Chemistry Research*, 61(43), 16383–16392. <https://doi.org/10.1021/acs.iecr.2c02875>
- Anagnostopoulos, D. A., & Tsalts, D. (2022). Current Status, Recent Advances, and Main Challenges on Table Olive Fermentation: The Present Meets the Future. *Frontiers in Microbiology*, 12, 797295. <https://doi.org/10.3389/fmicb.2021.797295>

- Andronikou, M., Adamou, V., Koutsokeras, L., Constantinides, G., & Vyrides, I. (2022). Magnesium ribbon and anaerobic granular sludge for conversion of CO₂ to CH₄ or biogas upgrading. *Chemical Engineering Journal*, 435, 134888. <https://doi.org/10.1016/j.cej.2022.134888>
- Andronikou, M., Lytras, N., Chrysanthou, G., Koutsokeras, L., Constantinides, G., Stylianou, M., Agapiou, A., & Vyrides, I. (2022). Biogas upgrading to methane and removal of volatile organic compounds in a system of zero-valent iron and anaerobic granular sludge. *Environmental Science and Pollution Research*, 29(58), 87245–87256. <https://doi.org/10.1007/s11356-022-21750-5>
- Angelis-Dimakis, A., Arampatzis, G., Alexopoulos, A., Pantazopoulos, A., Vyrides, I., Chourdakis, N., & Angelis, V. (2022). Waste Management and the Circular Economy in Cyprus—The Case of the SWAN Project. *Environments - MDPI*, 9(2), 16. <https://doi.org/10.3390/environments9020016>
- Bintsis, T., & Papademas, P. (2022). The Evolution of Fermented Milks, from Artisanal to Industrial Products: A Critical Review. *Fermentation*, 8(12), 679. <https://doi.org/10.3390/fermentation8120679>
- Blancher, P., Lefrançois, E., Rimet, F., Vasselon, V., Argillier, C., Arle, J., Beja, P., Boets, P., Boughaba, J., Chauvin, C., Deacon, M., Duncan, W., Ejdung, G., Erba, S., Ferrari, B., Fischer, H., Hänfling, B., Haldin, M., Hering, D., ... Bouchez, A. (2022). A strategy for successful integration of DNA-based methods in aquatic monitoring. *Metabarcoding and Metagenomics*, 6, 215–226. <https://doi.org/10.3897/mbmg.6.85652>
- Carta, S., Tsiplakou, E., Mitsiopolou, C., Pulina, G., & Nudda, A. (2022). Cocoa husks fed to lactating dairy ewes affect milk fatty acid profile and oxidative status of blood and milk. *Small Ruminant Research*, 207, 106599. <https://doi.org/10.1016/j.smallrumres.2021.106599>
- Christofi, M., Pavlou, A., Lantzouraki, D. Z., Tsiaka, T., Myrtsi, E., Zoumpoulakis, P., Haroutounian, S. A., Mauromoustakos, A., Biliaderis, C. G., & Manganaris, G. A. (2022). Profiling carotenoid and phenolic compounds in fresh and canned fruit of peach cultivars: Impact of genotype and canning on their concentration. *Journal of Food Composition and Analysis*, 114, 104734. <https://doi.org/10.1016/j.jfca.2022.104734>
- Chrysargyris, A., Höfte, M., Tzortzakis, N., Petropoulos, S. A., & di Gioia, F. (2022). Editorial: Micronutrients: The Borderline Between Their Beneficial Role and Toxicity in Plants. *Frontiers in Plant Science*, 13. <https://doi.org/10.3389/fpls.2022.840624>
- Chrysargyris, A., Petropoulos, S. A., & Tzortzakis, N. (2022). Essential Oil Composition and Bioactive Properties of Lemon Balm Aerial Parts as Affected by Cropping System and Irrigation Regime. *Agronomy*, 12(3), 649. <https://doi.org/10.3390/agronomy12030649>
- Fanourakis, D., Nikoloudakis, N., Paschalidis, K., Christopoulos, M. v, Goumenaki, E., Tsantili, E., Delis, C., & Tsaniklidis, G. (2022). Gene Expression, Activity and Localization of Beta-Galactosidases during Late Ripening and Postharvest Storage of Tomato Fruit. *Agriculture*, 12(6), 778. <https://doi.org/10.3390/agriculture12060778>
- Frantzis, C., Zannis, T., Savva, P. G., & Yfantis, E. A. (2022). A Review on Experimental Studies Investigating the Effect of Hydrogen Supplementation in CI Diesel Engines—The Case of HYMAR. *Energies*, 15(15), 5709. <https://doi.org/10.3390/en15155709>
- Gatidou, G., Constantinou, M., Koutsokeras, L., Vyrides, I., & Constantinides, G. (2022). Efficiency of Carbon-Based Electrodes on a Microbial Electrolysis System for the Treatment of Bilge Water. *Frontiers in Environmental Science*, 10. <https://doi.org/10.3389/fenvs.2022.894240>
- Gatidou, G., Drakou, E.-M., & Vyrides, I. (2022). Assessment of Bilge Water Degradation by Isolated *Citrobacter* sp. and Two Indigenous Strains and Identification of Organic Content by GC-MS. *Water*, 14(9), 1350. <https://doi.org/10.3390/w14091350>

- Gatidou, G., Samanides, C. G., Fountoulakis, M. S., & Vyrides, I. (2022). Microbial electrolysis cell coupled with anaerobic granular sludge: A novel technology for real bilge water treatment. *Chemosphere*, 296, 133988. <https://doi.org/10.1016/j.chemosphere.2022.133988>
- Georgiou, S., Koutsokeras, L., Constantinou, M., Majzer, R., Markiewicz, J., Siedlecki, M., Vyrides, I., & Constantinides, G. (2022). Microbial Electrosynthesis Inoculated with Anaerobic Granular Sludge and Carbon Cloth Electrodes Functionalized with Copper Nanoparticles for Conversion of CO₂ to CH₄. *Nanomaterials*, 12(14), 2472. <https://doi.org/10.3390/nano12142472>
- Giamouri, E., Mavrommatis, A., Simitzis, P. E., Mitsiopolou, C., Haroutounian, S. A., Koutinas, A., Pappas, A. C., & Tsiplakou, E. (2022). Redefining the Use of Vinification Waste By-Products in Broiler Diets. *Sustainability*, 14(23), 15714. <https://doi.org/10.3390/su142315714>
- Goulas, V., Banegas-Luna, A. J., Constantinou, A., Pérez-Sánchez, H., & Barbouti, A. (2022). Computation Screening of Multi-Target Antidiabetic Properties of Phytochemicals in Common Edible Mediterranean Plants. *Plants*, 11(13), 1367. <https://doi.org/10.3390/plants11131637>
- Hadjimbei, E., Botsaris, G., & Chrysostomou, S. (2022). Beneficial Effects of Yoghurts and Probiotic Fermented Milks and Their Functional Food Potential. *Foods*, 11(17), 2691. <https://doi.org/10.3390/foods11172691>
- Hafeez, S., Al-Salem, S. M., Bansode, A., Villa, A., Dimitratos, N., Manos, G., & Constantinou, A. (2022). Computational Investigation of Microreactor Configurations for Hydrogen Production from Formic Acid Decomposition Using a Pd/C Catalyst. *Industrial and Engineering Chemistry Research*, 61(4), 1655–1665. <https://doi.org/10.1021/acs.iecr.1c04128>
- Hafeez, S., Harkou, E., Al-Salem, S. M., Goula, M. A., Dimitratos, N., Charisiou, N. D., Villa, A., Bansode, A., Leeke, G., Manos, G., & Constantinou, A. (2022). Hydrogenation of carbon dioxide (CO₂) to fuels in microreactors: a review of set-ups and value-added chemicals production. *Reaction Chemistry and Engineering*, 7(4), 795–812. <https://doi.org/10.1039/d1re00479d>
- Hafeez, S., Harkou, E., Spanou, A., Al-Salem, S. M., Villa, A., Dimitratos, N., Manos, G., & Constantinou, A. (2022). Review on recent progress and reactor set-ups for hydrogen production from formic acid decomposition. *Materials Today Chemistry*, 26, 101120. <https://doi.org/10.1016/j.mtchem.2022.101120>
- Hassanpouraghdam, M. B., Vojodi Mehrabani, L., Kheiri, M., Chrysargyris, A., & Tzortzakis, N. (2022). Physiological and biochemical responses of *Tanacetum balsamita* L. to the foliar application of Dobogen biostimulant, glucose and KNO₃ under salinity stress. *Scientific Reports*, 12(1), 9320. <https://doi.org/10.1038/s41598-022-13150-z>
- Ioannidou, S. C., Litskas, V. D., Stavrinides, M. C., & Vogiatzakis, I. N. (2022). Linking management practices and soil properties to Ecosystem Services in Mediterranean mixed orchards. *Ecosystem Services*, 53, 101378. <https://doi.org/10.1016/j.ecoser.2021.101378>
- Ioannidou, S., Litskas, V., Stavrinides, M., & Vogiatzakis, I. (2022). Placing Ecosystem Services within the Water–Food–Energy–Climate Nexus: A Case Study in Mediterranean Mixed Orchards. *Agronomy*, 12(9), 2224. <https://doi.org/10.3390/agronomy12092224>
- Ioannou, K., Eleftheriou, C., Drouza, C., Pafiti, K. S., Panayi, T., Keramidas, A. D., Zacharia, L. C., & Vlasiou, M. C. (2022). Novel Zinc and Vanadium (V) Hydroquinonate Complexes: Synthesis and Biological Solution Evaluation. *Journal of Molecular Structure*, 1257, 132582. <https://doi.org/10.1016/j.molstruc.2022.132582>
- Jafari, S., Mousavi-Fard, S., Rezaei Nejad, A., Mumivand, H., Sorkheh, K., Nikoloudakis, N., & Fanourakis, D. (2022). Chitosan and Titanium Dioxide Are More Effective in Improving Seed Yield and Quality in Nanoparticle Compared to Non-Structured Form: A Case Study in Five Milk Thistle Ecotypes (*Silybum marianum* (L.) Gaertn.). *Agronomy*, 12(8), 1827. <https://doi.org/10.3390/agronomy12081827>

- Kamilari, E., Tsaltas, D., Stanton, C., & Ross, R. P. (2022). Metataxonomic Mapping of the Microbial Diversity of Irish and Eastern Mediterranean Cheeses. *Foods*, 11(16), 2483. <https://doi.org/10.3390/foods11162483>
- Kanetis, L. I., Taliadoros, D., Makris, G., & Christoforou, M. (2022). A Novel Seimatosporium and Other Sporocadaceae Species Associated with Grapevine Trunk Diseases in Cyprus. *Plants*, 11(20), 2733. <https://doi.org/10.3390/plants11202733>
- Kapnisis, K., Chrysargyris, A., Prokopi, M., Varda, E., Kokkinidou, D., Samourides, A., Xylia, P., Onisiforou, P., Stavrinides, M., Tzortzakis, N., & Anayiotos, A. (2022). Effects on Lettuce Yield Parameters and Toxicological Safety Assessment of a Plant-Derived Formulation Based on Rosemary and Eucalyptus Essential Oils. *Agronomy*, 12(11), 2861. <https://doi.org/10.3390/agronomy12112861>
- Keliri, E., Adamou, P., Efstathiou, N., Kokkinidou, D., Kapnisis, K., Anayiotos, A. S., Mazur-Marzec, H., & Antoniou, M. G. (2022). Calcium peroxide (CaO₂) granules enclosed in fabrics as an alternative H₂O₂ delivery system to combat *Microcystis* sp. *Chemical Engineering Journal Advances*, 11, 100318. <https://doi.org/10.1016/j.ceja.2022.100318>
- Keramidas, A. D., Drouza, C., Licini, G., & Crans, D. C. (2022). Biological contributions to the 12th international vanadium symposium. *Journal of Inorganic Biochemistry*, 237, 112014. <https://doi.org/10.1016/j.jinorgbio.2022.112014>
- Keramidas, A. D., Hadjithoma, S., Drouza, C., Andrade, T. S., & Lianos, P. (2022). Four electron selective O₂ reduction by a tetranuclear vanadium(IV/V)/hydroquinonate catalyst: Application in the operation of Zn-air batteries. *New Journal of Chemistry*, 46(2), 470–479. <https://doi.org/10.1039/d1nj03626b>
- Kostara, M., Chondrou, V., Fotopoulos, V., Sgourou, A., & Tsaouri, S. (2022). Epigenetic/genetic variations in CG-rich elements of immune-related genes contribute to food allergy development during childhood. *Pediatric Allergy and Immunology*, 33(6), e13812. <https://doi.org/10.1111/pai.13812>
- Kyrtzatis, A. C., Pallides, A., & Katsiotis, A. (2022). Investigating Stability Parameters for Agronomic and Quality Traits of Durum Wheat Grown under Mediterranean Conditions. *Agronomy*, 12(8). <https://doi.org/10.3390/agronomy12081774>
- Litskas, V., Ledo, A., Lawrence, P., Chrysargyris, A., Giannopoulos, G., Heathcote, R., Hastings, A., Tzortzakis, N., & Stavrinides, M. (2022). Use of Winery and Animal Waste as Fertilizers to Achieve Climate Neutrality in Non-Irrigated Viticulture. *Agronomy*, 12(10), 2375. <https://doi.org/10.3390/agronomy12102375>
- Loizou, M., Papaphilippou, P., Vlasidou, M., Spilia, M., Peschos, D., Simos, Y. v, Keramidas, A. D., & Drouza, C. (2022). Binuclear VIV/V, MoVI and ZnII - hydroquinonate complexes: Synthesis, stability, oxidative activity and anticancer properties. *Journal of Inorganic Biochemistry*, 235, 111911. <https://doi.org/10.1016/j.jinorgbio.2022.111911>
- Maggini, R., Tzortzakis, N., & Currey, C. J. (2022). Editorial: Soilless Culture for Vegetative Biomass Production and Specialized Metabolites: Medicinal, Aromatic, and Edible Plants. *Frontiers in Plant Science*, 13. <https://doi.org/10.3389/fpls.2022.887487>
- Makris, G., Nikoloudakis, N., Samaras, A., Karaoglanidis, G. S., & Kanetis, L. I. (2022). Under Pressure: A Comparative Study of *Botrytis cinerea* Populations from Conventional and Organic Farms in Cyprus and Greece. *Phytopathology*, 112(10), 2236–2247. <https://doi.org/10.1094/PHYTO-12-21-0510-R>
- Makris, G., Solonos, S., Christodoulou, M., & Kanetis, L. I. (2022). First Report of *Diaporthe foeniculina* Associated with Grapevine Trunk Diseases on *Vitis vinifera* in Cyprus. *Plant Disease*, 106(4), 1294. <https://doi.org/10.1094/PDIS-03-21-0503-PDN>

- Mallouppas, G., Yfantis, E. A., Frantzis, C., Zannis, T., & Savva, P. G. (2022). The Effect of Hydrogen Addition on the Pollutant Emissions of a Marine Internal Combustion Engine Genset. *Energies*, 15(19), 7206. <https://doi.org/10.3390/en15197206>
- Manganaris, G. A., Minas, I., Cirilli, M., Torres, R., Bassi, D., & Costa, G. (2022). Peach for the future: A specialty crop revisited. *Scientia Horticulturae*, 305, 111390. <https://doi.org/10.1016/j.scienta.2022.111390>
- Markakis, E. A., Soultatos, S. K., Koubouris, G. C., Psarras, G., Kanetis, L., Papadaki, A. A., & Goumas, D. E. (2022). First Report of *Pseudophaeomoniella oleae* Causing Wood Streaking and Decay on Olive Trees in Greece. *Plant Disease*, 106(8), 2263. <https://doi.org/10.1094/PDIS-10-21-2353-PDN>
- Martínez-Campos, S., Pissaridou, P., Drakou, K., Shammass, C., Andreou, K., González-Pleiter, M., Fernández-Piñas, F., Leganes, F., Rosal, R., Koutinas, M., Kapnisis, K., & Vasquez, M. I. (2022). Evolution of prokaryotic colonisation of greenhouse plastics discarded into the environment. *Ecotoxicology and Environmental Safety*, 232, 113213. <https://doi.org/10.1016/j.ecoenv.2022.113213>
- Meléndez-Martínez, A. J., Mandić, A. I., Bantis, F., Böhm, V., Borge, G. I. A., Brnčić, M., Bysted, A., Cano, M. P., Dias, M. G., Elgersma, A., Fikselová, M., García-Alonso, J., Giuffrida, D., Gonçalves, V. S. S., Hornero-Méndez, D., Kljak, K., Lavelli, V., Manganaris, G. A., Mapelli-Brahm, P., ... O'Brien, N. (2022). A comprehensive review on carotenoids in foods and feeds: status quo, applications, patents, and research needs. *Critical Reviews in Food Science and Nutrition*, 62(8), 1999–2049. <https://doi.org/10.1080/10408398.2020.1867959>
- Michael, C., Gil, E., Gallart, M., Kanetis, L., & Stavrinides, M. C. (2022). Evaluating the effectiveness of low volume spray application using air-assisted knapsack sprayers in wine vineyards. *International Journal of Pest Management*, 68(2), 148–157. <https://doi.org/10.1080/09670874.2020.1807652>
- Miliou, O., Ioannou, A., Georgiou, Y., Vyrides, I., Xekoukoulotakis, N., Willert, S., Andreou, A., Andreou, P., Komnitsas, K., Zaphiris, P., & Yiatros, S. (2022). The Design of a Postgraduate Vocational Training Programme to Enhance Engineering Graduates' Problem-Solving Skills Through PBL. *International Journal of Engineering Education*, 38(5 A), 1257–1273. <https://doi.org/10.5281/zenodo.7589566>
- Miranda, M. Á., Barceló, C., Arnoldi, D., Augsten, X., Bakran-Leb, K., Balatsos, G., Bengoa, M., Bindler, P., Boršová, K., Bourquia, M., Bravo-Barrig, D., Cabanová, V., Caputo, B., Christou, M., Delacour, S., Eritja, R., Fassi-Fihri, O., Ferraguti, M., Flacio, E., ... della Torre, A. (2022). AIMSURV: First pan-European harmonized surveillance of *Aedes* invasive mosquito species of relevance for human vector-borne diseases. *GigaByte*, 2022, 1-11. <https://doi.org/10.46471/gigabyte.57>
- Montoneri, E., Koutinas, M., Padoan, E., Negro, V., Licignano, C., Leone, S., Photiou, P., Kallis, M., Vyrides, I., Liendo, F., Negre, M., Solaro, S., Antonini, M., Mainero, D., Vlysidis, A., Konstantinidis, V., Ladakis, D., Maina, S., & Koutinas, A. (2022). Integrated chemical and biochemical technology to produce biogas with a reduced ammonia content from municipal biowaste. Validating lab-scale research in a real operational environment. *Environmental Science: Advances*, 1(5), 746–768. <https://doi.org/10.1039/d2va00068g>
- Neokleous, I., Tarapata, J., & Papademas, P. (2022). Nonthermal turbulent flow ultraviolet-C (UV-C) radiation processing for cheese whey-brines purification. *International Journal of Dairy Technology*, 75(3), 710–716. <https://doi.org/10.1111/1471-0307.12883>
- Neokleous, I., Tarapata, J., & Papademas, P. (2022). Non-thermal Processing Technologies for Dairy Products: Their Effect on Safety and Quality Characteristics. *Frontiers in Sustainable Food Systems*, 6, 856199. <https://doi.org/10.3389/fsufs.2022.856199>

- Neri, D., Crescenzi, S., Massetani, F., Manganaris, G. A., & Giorgi, V. (2022). Current trends and future perspectives towards sustainable and economically viable peach training systems. *Scientia Horticulturae*, 305, 111348. <https://doi.org/10.1016/j.scienta.2022.111348>
- Nicodemou, A., Kallis, M., Agapiou, A., Markidou, A., & Koutinas, M. (2022). The Effect of Trophic Modes on Biomass and Lipid Production of Five Microalgal Strains. *Water (Switzerland)*, 14(2), 240. <https://doi.org/10.3390/w14020240>
- Nikiforidis, V.-M., Tsalikis, D. G., & Stephanou, P. S. (2022). On the Use of a Non-Constant Non-Affine or Slip Parameter in Polymer Rheology Constitutive Modeling. *Dynamics*, 2(4), 380–398. <https://doi.org/10.3390/dynamics2040022>
- Nisiforou, O., Shakou, L. M., Magou, A., & Charalambides, A. G. (2022). A Roadmap towards the Decarbonization of Shipping: A Participatory Approach in Cyprus. *Sustainability (Switzerland)*, 14(4), 2185. <https://doi.org/10.3390/su14042185>
- Papademas, P., Mousikos, P., & Aspri, M. (2022). Valorization of donkey milk: Technology, functionality, and future prospects. *JDS Communications*, 3(3), 228–233. <https://doi.org/10.3168/jdsc.2021-0175>
- Papadimitriou, M. K., & Stephanou, P. S. (2022). Modeling the rheological behavior of crude oil-water emulsions. *Physics of Fluids*, 34(11), 113107. <https://doi.org/10.1063/5.0123274>
- Papadopoulos, K. P., Economou, C. N., Markou, G., Nicodemou, A., Koutinas, M., Tekerlekopoulou, A. G., & Vayenas, D. v. (2022). Cultivation of *Arthrospira platensis* in Brewery Wastewater. *Water (Switzerland)*, 14(10), 1547. <https://doi.org/10.3390/w14101547>
- Papanikolaou, M. G., Simaioforidou, A. v, Drouza, C., Tshipis, A. C., Miras, H. N., Keramidas, A. D., Louloudi, M., & Kabanos, T. A. (2022). A Combined Experimental and Theoretical Investigation of Oxidation Catalysis by cis-[VIV(O)(Cl/F)(N4)]+Species Mimicking the Active Center of Metal-Enzymes. *Inorganic Chemistry*, 61(46), 18434–18449. <https://doi.org/10.1021/acs.inorgchem.2c02526>
- Pe'er, G., Finn, J. A., Díaz, M., Birkenstock, M., Lakner, S., Röder, N., Kazakova, Y., Šumrada, T., Bezák, P., Concepción, E. D., Dänhardt, J., Morales, M. B., Rac, I., Špulerová, J., Schindler, S., Stavrinides, M., Targetti, S., Viaggi, D., Vogiatzakis, I. N., & Guyomard, H. (2022). How can the European Common Agricultural Policy help halt biodiversity loss? Recommendations by over 300 experts. *Conservation Letters*, 15(6). <https://doi.org/10.1111/conl.12901>
- Peratikou, S., & Charalambides, A. G. (2022). Estimating clear-sky PV electricity production without exogenous data. *Solar Energy Advances*, 2, 100015. <https://doi.org/10.1016/j.seja.2022.100015>
- Photiou, P., & Vyrides, I. (2022). Calcined eggshells in anaerobic digestion: Buffering acidification in AD and evaluating end products from phosphate adsorption as soil conditioners. *Journal of Environmental Chemical Engineering*, 10(3), 107957. <https://doi.org/10.1016/j.jece.2022.107957>
- Rajestary, R., Xylia, P., Chrysargyris, A., Romanazzi, G., & Tzortzakis, N. (2022). Preharvest Application of Commercial Products Based on Chitosan, Phosphoric Acid Plus Micronutrients, and Orange Essential Oil on Postharvest Quality and Gray Mold Infections of Strawberry. *International Journal of Molecular Sciences*, 23(24), 15472. <https://doi.org/10.3390/ijms232415472>
- Rotter, A., Gaudêncio, S. P., Dubnika, A., & Vasquez, M. I. (2022). Editorial: Marine Biotechnology, Revealing an Ocean of Opportunities. *Frontiers in Marine Science*, 9. <https://doi.org/10.3389/fmars.2022.887630>
- Schneider, X. T., Stroil, B. K., Tourapi, C., Rebours, C., Gaudêncio, S. P., Novoveska, L., & Vasquez, M. I. (2022). Responsible Research and Innovation Framework, the Nagoya Protocol and Other European Blue Biotechnology Strategies and Regulations: Gaps Analysis and Recommendations for Increased Knowledge in the Marine Biotechnology Community. *Marine Drugs*, 20(5), 290. <https://doi.org/10.3390/md20050290>

- Silva, S. R., Sacarrão-Birrento, L., Almeida, M., Ribeiro, D. M., Guedes, C., Montaña, J. R. G., Pereira, A. F., Zalis, K., Geraldo, A., Tzamaloukas, O., Cabrera, M. G., Castro, N., Argüello, A., Hernández-Castellano, L. E., Alonso-Diez, Á. J., Martín, M. J., Cal-Pereyra, L. G., Stilwell, G., & de Almeida, A. M. (2022). Extensive Sheep and Goat Production: The Role of Novel Technologies towards Sustainability and Animal Welfare. *Animals*, 12(7), 885. <https://doi.org/10.3390/ani12070885>
- Simitzis, P., Tzanidakis, C., Tzamaloukas, O., & Sossidou, E. (2022). Contribution of Precision Livestock Farming Systems to the Improvement of Welfare Status and Productivity of Dairy Animals. *Dairy*, 3(1), 12–28. <https://doi.org/10.3390/dairy3010002>
- Stasinakis, A. S., Charalambous, P., & Vyrides, I. (2022). Dairy wastewater management in EU: Produced amounts, existing legislation, applied treatment processes and future challenges. *Journal of Environmental Management*, 303, 114152. <https://doi.org/10.1016/j.jenvman.2021.114152>
- Stephanou, P. S. (2022). Correction to: Elucidating the rheological implications of adding particles in blood. *Rheologica Acta*, 61(11–12), 867–867. <https://doi.org/10.1007/s00397-022-01370-z>
- Stephanou, P. S., & Tsimouri, I. C. (2022). Erratum: A constitutive hemorheological model addressing the deformability of red blood cells in Ringer solutions (*Soft Matter* (2020) 16 (7585–7597) DOI: 10.1039/D0SM00974A). *Soft Matter*, 18(37), 7245. <https://doi.org/10.1039/d2sm90117j>
- Tomou, E.-M., Lytra, K., Chrysargyris, A., Christofi, M.-D., Miltiadous, P., Corongiu, G. L., Tziouvelis, M., Tzortzakis, N., & Skaltsa, H. (2022). Polar constituents, biological effects and nutritional value of *Sideritis sipylea* Boiss. *Natural Product Research*, 36(16), 4200–4204. <https://doi.org/10.1080/14786419.2021.1969649>
- Tselios, C., & Varotsis, C. (2022). Evidence for reversible light-dependent transitions in the photosynthetic pigments of diatoms. *RSC Advances*, 12(49), 31555–31563. <https://doi.org/10.1039/d2ra05284a>
- Tsiotsias, A. I., Charisiou, N. D., Harkou, E., Hafeez, S., Manos, G., Constantinou, A., Hussien, A. G. S., Dabbawala, A. A., Sebastian, V., Hinder, S. J., Baker, M. A., Polychronopoulou, K., & Goula, M. A. (2022). Enhancing CO₂ methanation over Ni catalysts supported on sol-gel derived Pr₂O₃-CeO₂: An experimental and theoretical investigation. *Applied Catalysis B: Environmental*, 318, 121836. <https://doi.org/10.1016/j.apcatb.2022.121836>
- Tziona, P., Theodosios-Nobelos, P., Papagiouvannis, G., Petrou, A., Drouza, C., & Rekka, E. A. (2022). Enhancement of the Anti-Inflammatory Activity of NSAIDs by Their Conjugation with 3,4,5-Trimethoxybenzyl Alcohol. *Molecules*, 27(7), 2104. <https://doi.org/10.3390/molecules27072104>
- Tzortzakis, N., Massa, D., & Vandecasteele, B. (2022). The Tripartite of Soilless Systems, Growing Media, and Plants through an Intensive Crop Production Scheme. *Agronomy*, 12(8), 1896. <https://doi.org/10.3390/agronomy12081896>
- Tzortzakis, N., Pitsikoulaki, G., Stamatakis, A., & Chrysargyris, A. (2022). Ammonium to Total Nitrogen Ratio Interactive Effects with Salinity Application on *Solanum lycopersicum* Growth, Physiology, and Fruit Storage in a Closed Hydroponic System. *Agronomy*, 12(2), 386. <https://doi.org/10.3390/agronomy12020386>
- Vyrides, I., & Kartakoullis, A. (2022). Next generation techniques for anaerobic bioprocess optimization. In *Current Developments in Biotechnology and Bioengineering: Advances in Bioprocess Engineering* (pp. 187–209). Elsevier. <https://doi.org/10.1016/B978-0-323-91167-2.00015-0>
- Xylia, P., Chrysargyris, A., Botsaris, G., Skandamis, P., & Tzortzakis, N. (2022). *Salmonella* Enteritidis survival in different temperatures and nutrient solution pH levels in hydroponically grown lettuce. *Food Microbiology*, 102, 103898. <https://doi.org/10.1016/j.fm.2021.103898>

Xylia, P., Chrysargyris, A., Miltiadous, P., & Tzortzakis, N. (2022). *Origanum dubium* (Cypriot Oregano) as a Promising Sanitizing Agent against *Salmonella enterica* and *Listeria monocytogenes* on Tomato and Cucumber Fruits. *Biology*, 11(12), 1772. <https://doi.org/10.3390/biology11121772>

Xylia, P., Chrysargyris, A., Shahwar, D., Ahmed, Z. F. R., & Tzortzakis, N. (2022). Application of Rosemary and Eucalyptus Essential Oils on the Preservation of Cucumber Fruit. *Horticulturae*, 8(9), 774. <https://doi.org/10.3390/horticulturae8090774>

Xylia, P., Fasko, K. G., Chrysargyris, A., & Tzortzakis, N. (2022). Heat treatment, sodium carbonate, ascorbic acid and rosemary essential oil application for the preservation of fresh *Rosmarinus officinalis* quality. *Postharvest Biology and Technology*, 187, 111868. <https://doi.org/10.1016/j.postharvbio.2022.111868>

Yousefzadeh, K., Houshmand, S., Shiran, B., Mousavi-Fard, S., Zeinali, H., Nikoloudakis, N., Gheisari, M. M., & Fanourakis, D. (2022). Joint Effects of Developmental Stage and Water Deficit on Essential Oil Traits (Content, Yield, Composition) and Related Gene Expression: A Case Study in Two *Thymus* Species. *Agronomy*, 12(5), 1008. <https://doi.org/10.3390/agronomy12051008>

Zomorodi, N., Nejad, A. R., Mousavi-Fard, S., Feizi, H., Nikoloudakis, N., & Fanourakis, D. (2022). Efficiency of Sodium and Calcium Chloride in Conferring Cross-Tolerance to Water Deficit in Periwinkle. *Horticulturae*, 8(11), 1091. <https://doi.org/10.3390/horticulturae8111091>

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