Manos Kokarakis

Ph.D. Scientist with 9+ years of experience in laboratory procedures and day-to-day lab operations across biochemistry, microbiology, and chemistry fields. Proven track record in laboratory management and project leadership, including planning, coordinating, and quality projects. Expert in developing and validating analytical methods for pharmaceutical, biological, and industrial applications.

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WORK EXPERIENCE

Post-doctoral Researcher **06/2025 – 2/2026**
Ducat lab, Michigan State University | Michigan, U.S.A
- Developed and validated high-throughput extraction protocols for the quantitative analysis of plant hormones in cyanobacteria using triple quadrupole LC-MS/MS (TQ-XS)
- Achieved 33% improvement in sample throughput and preparation time through processes skip & cost reduction
- Applied protocols across over 500 samples from 2 distinct bacterial strains
- Designed synthetic lichen models to study fungi-cyanobacteria symbiotic interactions
- Optimized culture conditions, media composition, and environmental parameters, leading to a 90% stable co-culture success rate
- Utilized optical microscopy for morphological characterization and LC-MS/MS for metabolic profiling
- Identified and characterized 2 key specialized metabolites indicative of inter-organism communication
- Managed daily operations of a research laboratory, ensuring technical readiness and resource availability for 10 researchers
- Trained and supervised a team of 7 researchers in advanced analytical techniques (LC-MS/MS, protocol execution, and data analysis
- Ensured 100% adherence to institutional safety and quality control standards across all laboratory procedures

PhD Candidate in Microbiology, Genetics, and Immunology **08/2020 – 10/2025**
Ducat lab, Michigan State University | Michigan, U.S.A
- Designed and constructed 30+ novel genetic vectors via Gibson Assembly, with 50% of the resulting data cited in publications.
- Executed restriction enzyme cloning and vector-modification workflows as project lead, managing 3 concurrent research projects from design to experimental execution. Managed plasmid production and quality control, ensuring the integrity of genetic tools for downstream applications.
- Performed extensive characterization analysis on microbial phenotypes, including Quantitative growth kinetics Advanced phenotypic Microscopy & imaging techniques, Mass Spectrometry (MS) analysis, and flow cytometry
- Developed, validated, and implemented 3 optimized extraction protocols for isolating target compounds, including lipids, and secondary metabolites from cyanobacteria and bacteria cells.
- Quantified cell viability and gene expression in 2.000 sample sets using Attune flow cytometry and BD-LSR II through the utilization of fluorescent reporters and viability dyes.
- Visiting scholar at the University of Düsseldorf, Germany (6–27 May 2024), strengthening ongoing collaborations.

Research Assistant **08/2016 – 09/2018**
Biochemistry Department, Ghanotakis Lab, University of Crete | Crete, Greece
- Optimized and implemented 4 novel extraction protocols for natural products from bacteria and supporting biofuel and food supplement formulation.
- Conducted characterization of 12+ natural product using GC-MS, HPLC, and IR Spectroscopy.
- Media preparation and aseptic cell culture maintenance for bacterial strains and HeLa cancer cells.
- Isolated, characterized and established cultures of cyanobacteria, microalgae, and bacteria from diverse environments.

Junior Research Assistant **09/2015 – 06/2016**
Biochemistry Department, Ghanotakis Lab, University of Crete | Crete, Greece

Lab Analyst (Internship) **06/2013 – 12/2013**
Bureau Veritas – Verifuel | Athens, Greece

EDUCATION

Ph.D. in Microbiology, Molecular Genetics & Immunology **06/2025**
Michigan State University | Michigan, U.S.A
Ph.D. Thesis: Ahl Quorum Sensing Systems Utilization in *Synechococcus elongatus PCC 7942*
GPA: 4.0/4.0

MSc in Chemistry
University of Crete | Crete, Greece
Major: Biochemistry
Master Thesis: Isolation and Characterization of Natural Productsfrom Photosynthetic Microorganisms
GPA: 9,17/10

BSc in Chemistry
University of Crete | Crete, Greece
Thesis: Phenol Biodegradation by Microalgae Chlamydomonas reinhardtii
GPA: 8,11/10

LANGUAGES & DIGITAL SKILLS

- **Greek**
  Native
- **English**
  Fluent – C2
- **Microsoft Office**
  Word – Excel – PowerPoint – Outlook
- **Other Skills**
  OriginLab – Minitab – FCS Express 7 – Benchling
- **Soft Skills:** Communication, Adaptability, Quick Learning, Goal-oriented, Teamwork, Organizational Skills

TECHNICAL SKILLS

- **Engineering:** Synthetic Biology, Bioencapsulation, Enzyme Engineering
- **Characterization:** Optical Microscopy, UV-Vis Spectroscopy, Flow Cytometry, Enzyme assays, Elisa, Western blot, DNA gel electrophoresis
- **Molecular Biology:** PCR, Cloning, DNA Sequencing, Gibson assembly, Genomic engineering, Restriction enzyme cloning, DNA/RNA extraction, Plasmid and primer desgin
- **Analytical techniques:** LC-MS(Q-Exactive and TQ-XS), GC-MS, HPLC, IR-Spectroscopy, NMR
- **Microbiology:** Aseptic technique, Media Preparation, Cell Cultures (cancer cells, bacteria, cyanobacteria, yeast, microalgae)

PUBLICATIONS

- **Kokarakis, E.J, et al**,. (2025).*Engineering quorum-sensing circuits in Synechococcus elongatus PCC 7942 towards self-inducible systems* .Metabolic Engineering Volume 92, November 2025, Pages 76-89
- María Santos-Merino, **Emmanuel J. Kokarakis, et al**,. (2025). *Plastoquinone redox status influences carboxysome integrity via a RpaA-and reactive oxygen species-dependent regulatory network*.The Plant Journal 19 September 2025
- Hasenklever, D., Pohlentz, J. C., Berwanger, T., **Kokarakis, E. J.**, Hassan, T., Schipper, K., Matuszyńska, A., Axmann, I. M., & Ducat, D. C. (2024). *Assembly and Quantification of Co-Cultures Combining Heterotrophic Yeast with Phototrophic Sugar-Secreting Cyanobacteria. Journal of Visualized Experiments (JoVE)*, 214, e67311
- Sakkos, J. K., Santos-Merino, M., **Kokarakis, E. J.,** Li, B., Fuentes-Cabrera, M., Zuliani, P., & Ducat, D. C. (2023). *Predicting partner fitness based on spatial structuring in a light-driven microbial community. PLOS Computational Biology*, 19(5), e1011045
- **Kokarakis, E. J.**, Ladakis, E., & Petrakakos, H. (2023). *Microplastics and their Impact on the Marine Environment. SNAME International Symposium on Ship Operations, Management and Economics*, D0215006R003.
- **Kokarakis, E. J**., Rillema, R., Ducat, D. C., & Sakkos, J. K. (2022). *Developing cyanobacterial quorum sensing toolkits: toward interspecies coordination in mixed autotroph/heterotroph communities. ACS Synthetic Biology*, 12(1), 265-276.
- **EJ Kokarakis, et al.** (2022). *Structural and physicochemical characterization of an aminosugar-rich exopolysaccharide isolated from a Algal Research* 68, 102881.
- Nazos, T. T., **Kokarakis, E. J.,** Valsami, E.-A., Stratigakis, N.-C., Poloniataki, E. G., Sfendourakis, G. P., & Ghanotakis, D. F. (2020). *Characterization of a novel herbicide and antibiotic-resistant Chlorella sp. with an extensive extracellular matrix. Photosynthesis Research*, 143, 315-334

CONFERENCES

- **Autoinduction expression systems by AHL-mediated quorum sensing circuits in Synechococcus elongatus PCC 7942**
  15th Cyano Worskshop | Tennessee, United States 2025
- **Bacteria Encapsulation in Alginate Beads Demonstration**
  MibiNext's Workshop | Düsseldorf and Aachen, Germany 2024
- **Poster: Application of Quorum Sensing System in Synechococcus Elongatus PCC 7942 for Harvesting Cell Biomass**
  14th Workshop on Cyanobacteria, International Conference | Michigan, U.S.A 2022
- **Poster: Improving Synthetic Cyanobacteria/Heterotroph Consortia with Rational Design: Stabilizing Light-driven Synthetic Microbial Consortia with Quorum Sensing Modules**
  Plant Research Laboratory Community Event (PRL retreat) | Michigan, U.S.A 2021

HONORS & AWARDS

- **Reddy Endowed Award by the Microbiology** 2024 & 2025
  Genetics, & Immunology Department of Michigan State University
- **Research Enhancement Award for Bacteria Encapsulation in Alginate Beads Demonstration** 2024
  Michigan State University
- **2nd Prize for the Poster Demonstrated** 2021
  Plant Research Laboratory (PRL) Retreat in the Michigan State University