

Konstantinos Kariotis

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Education

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- BSc. Biochemistry, University of Bristol** **2023-Present**
- Years 1 and 2 Average: 78% (First-Class Honours)
 - Skills: SDS-PAGE, ELISA, qPCR, kinetic assays, protein/nucleic acid purification, molecular cloning.
- Anatolia College (AC), International Baccalaureate; Thessaloniki** **2021-2023**
- Higher Level: Mathematics: Analysis and Approaches (6), Chemistry (6), Biology (6)
 - Standard Level: Business Management (6), English: Language and Literature (6), Greek: Literature (5)

Research Experience

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- Summer Research Intern, Biocompute Lab; University of Bristol** **July-August 2025**
- Optimized the Type I-F CRISPR-Associated Transposon (INTEGRATE/CAST) system, enhancing guide array design for highly multiplexed gene editing (Supervisor: Prof. Thomas Gorochofski).
 - Developed NoRDe, a computational tool for designing and analyzing RNA scaffolds with conserved structure and minimal sequence similarity, reducing homologous recombination risk. (<https://github.com/BiocomputeLab/NoRDe>)
 - Applied RNAfold-based scoring and sequence diversity metrics to guide evolution-aware scaffold engineering.
 - Generated functional scaffold variants in silico; experimentally validated arrays including a 12× array suppressing 12 E. coli genes.
- Founder, Wet Lab Advisor and Mentor, iGEM Competition; AC** **2022-2024**
- Led hybrid enzyme (IsPETase-HiCutinase) engineering, overseeing cloning, linker design, protein expression, and His-tag purification.
 - Oversaw molecular cloning and multi-gene plasmid assembly via Gibson assembly, validated constructs with restriction digestion.
 - Predicted conformational fidelity, flexibility, and potential steric clashes of linker candidates using AlphaFold2 and PyMOL, informing rational experimental design.
 - Used Python and MATLAB scripts to analyze enzyme kinetics and model reaction efficiency under different expression conditions.
 - Secured ~€25,000 in funding through investor outreach and sponsorship proposals, enabling acquisition of reagents, lab equipment, and project logistics.
- Founder, Team Leader, Researcher and Mentor, iGEM Competition; AC** **2021-2022**
- Managed a 15-member interdisciplinary team across four departments, coordinating research, project planning, and administrative workflow.
 - Engineered a denitrification metabolic pathway in E. coli for NirS production inspired by *Pseudomonas azotoformans*.
 - Modeled pathway output using ODE simulations in MATLAB, predicting metabolite flux under multiple regulatory scenarios to maximize NirS yield.
 - Conducted molecular cloning, plasmid verification via restriction digestion and ligation, and standard lab procedures including PCR, SDS-PAGE, Gibson assembly, and natural transformation.
 - Designed and characterised a novel sequence submitted to the Registry of Standard Biological Parts (Part: BBa_K4503000).

- Raised ~ €20,000 by approaching investors, drafting sponsorship proposals.
- 3D Modeled a biofilter for the catabolism of nitrates originating from fertilizers from eutrophicated water.
- Featured by Greece's state-owned broadcasting channel ERT, Vice, RThess, and other news outlets.

Lab Demonstrator, Technical Team Member, AC; Thessaloniki **June 2023**

- Trained 30 IB students in laboratory safety, experimental setup, aseptic techniques, plating, and precision pipetting, improving overall experimental accuracy.
- Assisted students in troubleshooting experiments, providing feedback on methodology, and suggesting improvements for five student experimental protocols.
- Prepared agar plates, solutions, and lab apparatus to ensure smooth workflow and reproducible results.
- Guided proper documentation and data recording, fostering good scientific practice.

Imperial Global Summer School; London, England **July 2022**

- Conducted biochemical analysis of genetically modified *Drosophila melanogaster* strains exhibiting novel fluorescent phenotypes.
- Performed PCR amplification, gel electrophoresis, and thermo-sensitivity assays to validate genetic modifications.
- Analyzed experimental data using basic statistics (mean fluorescence intensity, standard deviation, and correlation analyses) to confirm phenotype–genotype relationships.

Awards and Honours

Bronze Medal; iGEM Grand Jamboree	October 2024
Think Big Scholarship; University of Bristol (£39,000)	August 2022
Bronze Medal; iGEM Grand Jamboree	October 2022
Ypatia Environmental and Sustainability Award; Lions International Club	November 2022

Skills

Laboratory Techniques: CRISPR, SDS-PAGE, ELISA, qPCR, kinetic assays, protein/nucleic acid purification, molecular cloning, Golden Gate assembly, Gibson assembly.

Computational: GitHub, Python, MATLAB, AlphaFold, PyMOL, RNAfold, ODE modeling.

Data Analysis: SPSS, Enzyme kinetics modeling, correlation analysis, 3D modeling

Other Experiences

Delegate, Model United Nations; (LEMUN), (ACMUN), (DSAMUN) **2019-2023**

- Collaborated with international delegates to draft resolutions and negotiate policy.
- Delivered formal impromptu speeches to audiences of 50+ delegates, refining public speaking and persuasion skills.
- Awarded Best Delegate and honours in DSAMUN 2021, ACMUN 2021 and 2022.
- Strengthened teamwork, leadership, written, and verbal communication skills in high-pressure settings.

Member, Impromptu Speaking Club; AC **2021-2023**

- Selected to represent AC at national competitions, preparing and delivering spontaneous speeches to audiences of 30+.
- Developed critical thinking, rapid problem-solving, and advanced public speaking skills.