Asterios Arampatzis

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Education

PhD, Control Theory and Systems Biology — *ETH Zurich*
Department of Biosystems Science and Engineering — *Jun 2022 - present*

MSc, Biotechnology — *ETH Zurich*
Department of Biosystems Science and Engineering — *Sep 2019 - Sep 2021*

Doctor of Medicine (MD) — *AUTh*
School of Medicine — *Sep 2013 - Jul 2019*

Research Experience

Control Theory and Systems Biology Laboratory, D-BSSE — *ETH Zurich*
PhD Student (Supervisor: Prof. M. Khammash) — *Jun 2022 - present*

- Engineering homeostatic synthetic gene circuits for immune system regulation

Laboratory for Biological Engineering, D-BSSE — *ETH Zurich*
MSc Thesis Student - Research Associate (Supervisor: Prof. R. Platt) — *Jan 2021 - Mar 2022*

- Engineered biosensors for short-chain fatty acids via directed evolution, towards gut monitoring
- Identified improved variants and characterized their performance with high-throughput time course assays
- Performed structural modeling with deep learning methods

Control Theory and Systems Biology Laboratory, D-BSSE — *ETH Zurich*
MSc Student (Supervisor: Prof. M. Khammash) — *Jul 2020 - Jan 2021*

- Designed, cloned and characterized various genetic circuits for *in vivo* feedback control
- Implemented ODE-based disease models for different pathologies
- Modeled different control strategies using stochastic models
- Co-author of a research article in PNAS

AcubeSAT satellite mission — *SpaceDot*
Science Lead — *Oct 2018 - present*

- Science lead of AcubeSAT, a 3U CubeSat mission supported by the European Space Agency (ESA) Education Office
- Conceived, engineered and flight-qualified an autonomous satellite laboratory for high-throughput biology in space, integrating biology, microfluidics, imaging, sensing, and onboard experiment control
- Led the science/payload subsystem (∼30 members over time) to achieve multiple milestones including:
  - Successful full environmental qualification (vibration, thermal-vacuum, leak testing)
  - Characterization of yeast response to radiation exposure
  - System design maturation and compliance with ESA requirements
  - Submission and defense of the project proposal
- Selected as 1 of 3 teams in Europe (and first in Greece) for the ESA Fly Your Satellite! 3 program
- Featured in European Space Agency news, national TV (ERT3), and leading press outlets (coverage)

Laboratory of Biological Network Characterization — *EPFL*
Research Intern (Supervisor: Prof. S. Maerkl) — *Jul 2018 - Aug 2018*

- Forward-engineering of an orthogonal cell-free circular DNA replication system
- Identified, cloned, and purified components of the RSF1010 replication machinery and tested *in vitro* replication assays
- Assessed binding affinities of RSF1010-encoded proteins using microfluidic platforms (MITOMI)

Team iGEM Greece 2017 — *AUTh*
Team Leader/Founder — *Oct 2016 - Nov 2017*

- Engineered RNAi-based logic circuits as colorectal cancer therapeutics (pANDORRA project)
- Used kinetic modeling and genetic algorithms to optimize miRNA combinations and circuit topologies for cell-type classification
- Developed a modular and interoperable platform for mammalian genetic logic circuit assembly
- Optimized an *E. coli*-based delivery system and leveraged quorum sensing for cell-density-dependent invasion into cancer cells
- Led a multi-disciplinary group of 11 students spanning 7 departments across 2 universities
- Founded Greece's first synthetic biology university team; awarded Gold Medal and nominated for Best Therapeutics Project
- Featured in national TV (SKAI) and leading press outlets

Wellcome Trust-MRC Cambridge Stem Cell Institute — *University of Cambridge*
Amgen Scholar (Supervisor: Dr. I. Kazanis) — *Jul 2016 - Sep 2016*

- Isolated endogenous neural stem/progenitor cells from the cerebrospinal fluid and characterized their *in vitro* profile and expansion properties
- Optimized an isolation protocol of neural stem cells from the subventricular zone of live rats
- Profiled isolated postnatal neural stem cells and evaluated the effect of the choroid plexus secretome
- Co-author of a research article in Stem Cell Reports

Laboratory of Biological Chemistry, School of Medicine — *AUTh*
Undergraduate Researcher (Supervisor: Prof. G. Koliakos) — *Oct 2015 - Feb 2016*

- Assessed the anti-aging and antioxidative properties of mesenchymal stem cells overexpressing the proteasome catalytic beta 5 subunit
- Performed catalase and superoxide dismutase activity assays using Wharton's jelly-derived mesenchymal stem cells

Honors & Awards

2026	**Eigenprize**, 3rd prize	*ORBIT & Mene Capital*
2022	**Jacobs Translational Medicine Fellowship**, Jacobs Institute	*Caltech*
2019	**Scholarship, ETH Master Scholarship Program**	*ETH Zurich*
2018	**Fellowship, School of Life Sciences Summer Research Program**, 1 of 25 from 600+ applicants	*EPFL*
2017	**Excellence Award**, by the Dean of Faculty of Sciences	*AUTh*
2017	**Gold Medal**, iGEM Greece 2017	*iGEM*
2017	**Nomination for "Best Therapeutics Project"**, iGEM Greece 2017	*iGEM*
2017	**Best Team Project**, Volos Summer School of Human Genetics	*VSS*
2016	**Scholarship, Amgen Scholars Program**, University of Cambridge	*Amgen Foundation*
2015	**Grant for attendance**, FENS Featured Regional Meeting 2015	*FENS*
2015	**Scholarship, International Summer Course "German for Medical Practitioners"**	*MGEPA NRW*
2012	**Scholarship, United World College Mostar**	*UWC*

Publications

Peer-reviewed research

A genetic mammalian proportional–integral feedback control circuit for robust and precise gene regulation — *PNAS*
Frei, T.*, Chang, C. H.*, Filo, M., **Arampatzis, A.**, Khammash, M. — *2022*

Isolation of neural stem and oligodendrocyte progenitor cells from the brain of live rats — *Stem Cell Reports*
McClenahan, F., Dimitriou, C., Koutsakis, C., Dimitrakopoulos, D., **Arampatzis, A.**, Kakouri, P., Kourla, M., Oikonomou, S., Andreopoulou, E., Patsonis, M., Meri, D.K., Rasool, R.T., Franklin, R.J.M., Kazanis, I. — *2021*

Infantile respiratory distress syndrome and its probable links with parameters of the maternal patient history: A forensic case report — *The American Journal of Forensic Medicine and Pathology*
Giannitsis, C., **Arampatzis, A.**, Stefanidou, M., Anestakis, D., Raikos, N., Pavlidis, P. — *2016*

A classification and comparative study of European biobanks: An analysis of biobanking activity and its contribution to scientific progress — *Archives of Medicine*
Arampatzis, A., Papagiouvanni, I., Anestakis, D., Tsolaki, M. — *2016*

Preprints

Engineering cybergenetic cell-based therapies — *bioRxiv*
Chang, C.H.*, **Arampatzis, A.***, Balula, S., Hou, M., Filo, M., Chen, M.,Cella, F., Khammash, M. — *2026*

Book chapters

Being a neural stem cell: A matter of character but defined by the microenvironment — *Stem Cell Microenvironments and Beyond*
Andreopoulou, E., **Arampatzis, A.**, Patsoni, M., & Kazanis, I. — *2017*

Presentations (selected)

Towards a cell-free DNA replication system — *Lausanne, Switzerland*
Arampatzis, A., Swank, Z., Maerkl, S. — *2018*
Poster at the EPFL SRP symposium, Lausanne, Switzerland

pANDORRA - Engineering & delivering modular RNAi-based logic circuits to treat colorectal cancer — *Boston, USA*
Arampatzis, A.*, Giannitsis, C.*, Ballhysa, E.,Sandaltzopoulou, E., Nikolopoulos, T., Samaras-Tsakiris,K., Papadimitriou, A., Theocharis, A., Akritidis, K., Komodromos, C., Papaioannou, N. — *2017*
Oral and poster presentation at the iGEM 2017 competition final phase, "Giant Jamboree", Boston, USA

Developing novel diagnostic and therapeutic tools for colorectal cancer through the use of genetically engineered E. coli — *Cambridge, UK*

Arampatzis, A.*, Giannitsis, C.*, Ballhysa, E., Nikolopoulos, T., Sandaltzopoulou, E., Akritidis, K., Papaioannou, N., Samaras-Tsakiris, K., Theocharis, A., Papadimitriou A., Sarigiannis, D., Koliakos, G. — *2017*

Poster presented at the 4th International Synthetic & Systems Biology Summer School, University of Cambridge, UK

Isolation of endogenous neural stem/progenitor cells from the cerebrospinal fluid: Investigating their in vitro profile and expansion properties — *Cambridge, UK*

Arampatzis, A., Rasool, RT., McClenahan, F., Kazanis, I. — *2016*

Poster presented at the Amgen Scholars Europe Symposium 2016, University of Cambridge, UK

A computational approach of temporal lobe epilepsy and the outcome of selective amygdalohippocampectomy utilizing a neural mass model — *Patras, Greece*

Giannitsis, C.*, **Arampatzis, A.***, Kosmidis E.K. — *2016*

Oral presentation at the 22nd Scientific Congress of Hellenic Medical Students - 10th International Forum of Hellenic Medical Students and Junior Doctors, Patras, Greece

Computational neuroscience: Mathematical modeling and simulation of neuronal activity in health and disease — *Thessaloniki, Greece*

Arampatzis, A. — *2016*

Oral presentation during the 8th International Week Dedicated to Maths, Thessaloniki, Greece

From membrane potential oscillations to the Bayesian brain: Analyzing computational models of grid and place cells — *Thessaloniki, Greece*

Giannitsis, C.*, **Arampatzis, A.***, Kosmidis E.K. — *2015*

Poster presented at the FENS Featured Regional Meeting 2015, Thessaloniki, Greece

Teaching, Mentorship & Community

Control Theory and Systems Biology Laboratory, D-BSSE — *ETH Zurich*

Student Supervisor — *Jun 2022 - present*

- Supervised and co-supervised 7 MSc students (5 thesis projects, 2 3-month research projects), mentoring them in experimental and computational research
- Students:
  - Mingzhe Chen (ETHZ Biotechnology), together with Dr. Ching-Hsiang Chang
  - Noemie Allet (ETHZ Biotechnology), together with Dr. Federica Cella
  - Gregor Prinz (TUM Biomedical Engineering and Medical Physics), together with Dr. Federica Cella
  - Ardian Mannhart (ETHZ Biotechnology), together with Dr. Federica Cella
  - Marie-Claire Indilewitsch (ETHZ Computational Biology and Bioinformatics), together with Dr. Samuel Balula
  - David Jewanski (ETHZ Biotechnology)
  - Mirriam Baranova-Gurvich (ETHZ Biotechnology), together with Dr. Samuel Balula

AcubeSAT satellite mission — *SpaceDot*

Science Lead — *Oct 2018 - present*

- Led an interdisciplinary science team of ∼30 students across engineering and life sciences; contributed to program-level coordination of ∼220 participants
- Enabled the generation of 12+ BSc/MSc theses and 5+ conference publications
- Established and maintained open-source software, hardware, and wetware repositories, adopted by multiple aerospace teams for development and training (e.g. Greek IOV teams)
- Raised more than 70,000€ in external sponsorship funding

Team iGEM Greece 2017 — *AUTh*

Team Leader/Founder — *Oct 2016 - Nov 2017*

- Oversaw integrated human practices and public engagement activities, including stakeholder consultation and science outreach initiatives
- Organized a workshop for ∼50 university peers about synthetic biology & modeling methods (InnovationLab, EMB IEEE Student Chapter AUTh)
- Delivered outreach workshops to ∼20 students (ages 14–18) on synthetic biology concepts
- Mentored subsequent iGEM teams (e.g. iGEM Thessaloniki 2019/2021, Patras-Med 2023/2024)
- Secured more than 45,000€ in competitive sponsorship funding
- Contributed to the expansion of the Greek synthetic biology ecosystem, which has since produced more than 45 teams nationwide

“Train Your Brain” program, by Eduact — *American Farm School*

Team Building Coach — *Feb 2016 - Apr 2016*

- Designed and delivered team-building workshops for ∼25 high-school students, fostering collaboration and communication skills

School of Medicine — *AUTh*
Teaching Assistant - Instructor — *Feb 2014 - Jan 2016*

- Instructed anatomy sessions for ∼20 medical students (Courses: Descriptive Anatomy I & III)
- Conducted hands-on clinical skills training, including urinary and intravenous catheterization and vital signs assessment (Course: Clinical Skills Laboratory)

Volunteering & Clinical Experience

Thessaloniki's Polyclinic, Doctors of the World — *Thessaloniki, Greece*
Volunteer - Medical Student — *Oct 2015 - Dec 2015*

- Provided primary health care to social groups with limited access to the National Health System

St. Ansgar Krankenhaus Höxter — *Höxter, Germany*
Clinical Intern in Neurology — *Aug 2015*

- Attended neurology ward rounds as a visiting medical student

Greek Association of Alzheimer's Disease and Related Disorders — *Thessaloniki, Greece*
Volunteer - Medical Student — *Oct 2014 - Jan 2015*

- Assisted in conducting medical interviews and provided support to patients with dementia and their caregivers as part of a multi-disciplinary care team

Social Policy and Health Committee, AUTh — *Thessaloniki, Greece*
Volunteer - Medical Student — *Mar 2014*

- Supported as an organiser a university-wide voluntary blood donation event

European Youth Parliament — *Europe*
Organizer/Journalist — *Dec 2013 - Apr 2014*

- Organizer (1 session in Greece)
- Journalist (2 sessions in Finland and Greece)
- Delegate (3 sessions in Greece and Serbia between 2011 and 2013)

Hellenic Medical Students' International Committee, AUTh — *Thessaloniki, Greece*
Volunteer - Medical Student — *Dec 2013 - Mar 2014*

- Participated in 6 public awareness campaigns regarding public health issues (e.g. tuberculosis, HIV prevention)

Independent Projects

NeMo (Neural Motors) Project — *Thessaloniki, Greece*
Co-creator — *Feb 2015 - Sep 2015*

- Created a Brain Computer Interface (BCI) by utilizing EEG-based signal analysis methods to wirelessly control an RC-car
- Attendee at Slush 2015, Helsinki, Finland
- Invited speaker (Tech-Alley at TEDxAcademy 2015 & 10th Hellenic Conference of Pharmaceutical Marketing, Athens, Greece) and speaker at Thessaloniki Science Festival, Thessaloniki, Greece
- Featured in national TV (ANT1 News) and 20+ media outlets

Extracurricular Training (selected)

Training Courses	Laboratory Animal Science (LTK Module 1), Mice & Rats — FELASA EU Functions A/C/D & Modules 10/20/21 (Institute of Laboratory Animal Science, University of Zurich, April 2026)
	Volos Summer School of Human Genetics (graduate-level; Volos, Greece, May 2017)
Seminars & Workshops	ESA Fly Your Satellite! 3 Phase D Training Week (remote, October 2022)
	ESA Fly Your Satellite! 3 Critical Design Workshop (remote, November 2020)
	ESA Fly Your Satellite! 3 Selection Workshop (ESA ESTEC, Netherlands, December 2019)
Scientific Conferences	Basel Cell Therapy Symposium 2025 (Basel, Switzerland, January 2025)
	2023 International Mammalian Synthetic Biology Workshop (San Jose, USA, June 2023)
Hackathons & Competitions	Johns Hopkins CBID COVID-19 Design Challenge (remote, March 2020)
	Arc Institute Virtual Cell Challenge (remote, 2025)

Languages

Greek	Native speaker
English	Proficient user (C2)
German	Independent user (B2)/Proficient user (C1) in medical practice
Greek Sign Language	Basic user with expertise in medical practice