Alexandra Paxinou

PERSONAL PROFILE

I am a postdoctoral researcher with experience in leading multidisciplinary European projects in the area of Biomaterials and their application in medicine. I have a track record in teaching and mentoring students at all levels. I have experience in writing successful grant proposals as well as I have a strong track record of collaborations with industry and other academic institutions. Moreover, I exhibit strong technical, analytical and inter-personal skills having exposed to multiple fast-paced working environments.

EDUCATION

06/2016 – 09/2020 **University of Westminster, School of Life Sciences,** London, UK
Doctor of Philosophy (Ph.D.) Applied Biotechnology
Thesis: Development of antibacterial Polyhydroxyalkanoates for their use in nerve tissue engineering.

09/2013 - 11/2015 **University of Patras, Department of Science Materials,** Patras, GR
MSc Science of Materials
Thesis: Development of nanostructured Pt/TiO_2 and Pt/CeO_2 catalysts for hydrogen production from methanol.

09/2008 - 09/2013 **University of Patras, Department of Science Materials,** Patras, GR
BSc (Hons) Material Science
Thesis: Production, Deposition and Characterization of Graphene.

EXPERIENCE

06/2021-PRESENT **Foundation for Research and Technology (FORTH),** Patra, GR
Postdoctoral Researcher at JOINTPROMISE and AIDPATH H2020 projects. JOINTPROMISE is a Research and Innovation Action funded by the European Commission under the Horizon 2020 framework program, call SC1-BHC-07-2019 – Regenerative medicine: from new insights to new applications (Grant agreement 874837). Exploration and development of artificial knee joints with the functional maturity of their native equivalents without any scaffold assistance via laser printed and/or use of perfusion bioreactors. AIDPATH is dedicated to enable and to augment the next-generation of personalised medicine with gene-engineered immune cells at EU hospitals through the use of AI technology. Applying AI technology to integrate patient-specific data and biomarkers in CAR-T therapy and to optimise scheduling and resource planning to reduce costs and hospital resource utilisation.

02/2020 – 03/2021 **University of Westminster,** London, UK

Research associate

Project 1:
Dual production of PHAs and metal particles. Production of sustainable polymers via bacterial fermentation, using microbial bioreactors, using carbon sources from waste streams and *in situ* reduction of the metals using the waste supernatant of the bioreactor.
Project 2: Development of environmentally friendly, safe antimicrobial/antiviral coatings for PPE.

Responsibilities: Large scale production of biodegradable polymers from waste sources. Profiling of the fermentation process estimating nitrogen concentration, OD, pH. Biomass and polymer yield estimation. Development and characterization (physicochemical and mechanical) of the final samples after the incorporation of antiviral compound and evaluation for antibacterial/antiviral efficacy.

Project management: Data analysis & interpretation, quality control (QC), generating project reports and setting up collaborations, overseeing project finances.
Lab management: Good laboratory practice (GLP), risk assessment of activities in both the chemical laboratory and fermentation suite. Supervising lab purchases, setting safety guidelines, maintaining stocks and directing maintenance of equipment and arranging training sessions (Microbiology, Bioprocess, Biomaterials, Cell culture).
Dissemination activities: Publishing research and review articles in peer reviewed journals.

06/2016 – 01/2020 **University of Westminster**, London, UK

Assistant Lecturer / Tutor

Chemistry and Mathematics (lectures and grade assessments).

Demonstrator

Biochemistry, Cell Biology, Microbiology, Medical Genetics & Genomics, Advance Pharmacology & Toxicology.

Assistant Technician

Equipment set up and preparation of reagents for practical lab classes. Carrying out risk assessments and safety statements. Maintaining and taking inventory of apparatus.

Supervisor

Assist undergraduate and postgraduate students during their period of registered study.

10/2017 - 12/2018 **University Hospital Knappschaftskrankenhaus GmbH / Ruhr-Universität**, Bochum, DE

Marie Curie Secondment - Clinical partner / Visiting researcher

Biological evaluation of biopolymers with respect to their antibacterial activity and cytotoxicity.
Antibacterial evaluation methods: Agar and broth dilution methods (MIC and MBC) according to UCAST and ISO standards (ISO 20776:1), biofilm, colony-forming unit (CFU), Kirby Bauer disk diffusion test against both Gram-positive and Gram-negative bacterial strains as well as clinical isolates of MRSA and MRSE.
Cytocompatibility and cytotoxicity of samples was investigated performing multiplex cell viability assays Cell Titer Blue and Cytotox One and alamar blue. Cell lines of L929 murine fibroblasts, NG108-15b neuronal cells, Schwann cell line (RN22) as well as Dorsal root ganglion (DRGs) neurons from the spinal cord of chicks were used. Fluorescent staining and microscopy. Direct and indirect cytocompatibility tests were carried out implemented ISO 10993-5.

09/2017 – 10/2017 **Uppsala Universitet**, **Department of Chemistry - Ångström Laboratory,** Uppsala, SE

Visiting Researcher

Chemical modification of Polyhydroxyalkanoates to obtain UV curable polymers; by diol formulation followed by methacrylation.

06/2016 – 09/2017 **University of Westminster**, London, UK

Marie Sklodowska-Curie Early-Stage Researcher

HyMedPoly Project: *Drug-Free Antibacterial Hybrid Biopolymers for Medical Applications*
EU H2020 Research and Innovation Programme (N° 643050) https://hymedpoly.eu/

Optimization and scaling-up of the production of novel natural polymers by bacterial fermentation.

Production, development and characterization of novel natural composites based on biopolymers with antibacterial properties.
Optimization of the processability (electrospinning, dip moulding, solvent casting and 3D printing) of the novel composite biopolymers and characterization of the constructs in terms of physical, thermal, mechanical and biological properties.
Writing of scientific reports in the form of journal articles and project deliverables.
Oral presentations at national/international conferences and HyMedPoly project meetings.

06/2016 – 01/2019 **Science4U - volunteering**, London, UK
Coordinator / Demonstrator (Annual School Science Conference)

Coordinating events for school children. Setting up an exhibit stand presenting various novel biomaterials for medical application and interacting with the students.

09/2013 – 12/2015 **Institute of Chemical Engineering Science / Foundation for Research and Technology (ICE-HT/FORTH),** Patras, GR
Research assistant

Development of a Portable Internal Reforming Methanol High Temperature PEM Fuel Cell System, (IRMFC grant).
• Supervising lab purchases, maintaining stocks
• Developing large amounts of catalysts for the fuel cell
• Conduct tests for the evaluation of the catalyst performance
• Assembly the fuel cell for and run the final tests
• Document the results
• Participate in various conferences and publish research articles

Seminars

12/2022-01/2023	"**Blockchain Introduction to Financial Services (74)**" E-Learning Center of the National Kapodistrian University of Athens (NKUA), Greece.
Principal subjects covered	• Technologies of the 4th Industrial Revolution • Digital Financing and Financial Inclusion • Blockchain and Distributed Ledger Technologies • Blockchain in Financial Services • The Future of Blockchain Technologies in the Financial Sector
10/2022-02/2023	"**Project Management Tool Kit**" E-Learning Center of the National Kapodistrian University of Athens (NKUA), Greece.
Principal subjects covered	• Technologies of the 4th Industrial Revolution • Basic Principles of Project Management • Project Delivery • Project Management Tips • Agile Methodology for Project Managers

CONTRIBUTION TO GRANT APPLICATION

1. **COVID-19 Funding Call**, **University of Westminster Research Communities**. Development of environmentally friendly, safe antimicrobial/antiviral coatings for PPE **(AWARDED).**

2. **Springboard Awards, The Academy of Medical Science.** Bioengineering a functional tracheal epithelium 3D *in vitro* model applicable for investigating COVID-19 infection.

3. **UKRI, India-UK Tackling AMR in the Environment from Antimicrobial Manufacturing Waste.** Development of an Antibacterial filter for bacterial inhibition/deactivation for use in effluent treatment in Pharmaceutical units in Sikkim.

PUBLICATIONS

Paxinou A, Nigmatullin, R., Paterakis G., Syngelou L., Galiotis C., R., Salber, J., Roy, I. "Development of polyhydroxyalkanoates/graphene oxide composites for their use in biomedical applications". **In progress.**

Paxinou A., Marcello E., Vecchiato V., Erman L., Wright E., Noble B., McCormick A., Basnett P., " Dual production of polyhydroxyalkanoates and antibacterial/antiviral gold nanoparticles". (2023) *Front. Nanotechnol.* 5:1243056. doi: 10.3389/fnano.2023.1243056.

Nigmatullin, R., Taylor C.S., Basnett P., Lukasiewicz B., Paxinou A., Lizarraga-Valderrama L.R., Haycock J.W., Roy I. "Medium chain length Polyhydroxyalkanoates as potential matrix materials for peripheral nerve regeneration ". *Regenerative Biomaterials*, (2023), doi: 10.1093/rb/rbad063. eCollection 2023.

Saravanou SF, Ioannidis K, Dimopoulos A, Paxinou A., Kounelaki F., Varsami SM, Tsistsilianis C., Papadoniou I., Pasparakis G., "Dually crosslinked injectable alginate-based graft copolymer thermoresponsive hydrogels as 3D printing bioinks for cell spheroid growth and release". *Carbohydrate Polymers*, (2023) 312:120790. https://doi.org/10.1016/j.carbpol.2023.120790

Lizarraga-Valderrama L.R., Ronchi G., Nigmatullin R., Fregnan F., Basnett P., Paxinou A., Geuna S., Roy I. " Preclinical study of peripheral nerve regeneration using nerve guidance conduits based on polyhydroxyalkanaotes ". *Bioengineering & Translational Medicine,* (2021);e10223.

Asare, E., Gregory D. A., Fricker A., Marcello E., Paxinou A., Taylor C.S., Haycock J.W., Roy I., " Polyhydroxyalkanoates, Their Processing and Biomedical Applications. In: The Handbook of Polyhydroxyalkanoates". *CRC Press* (2020).

Basnett, P., Marcello, E., Lukasiewicz, B., Nigmatullin, R., Paxinou, A., Haseeb Ahmad, M., Gurumayum, B., and Roy, I. "Antimicrobial Materials with Lime Oil and a Poly (3-hydroxyalkanoate) Produced via Valorisation of Sugar Cane Molasses". *Journal of Functional Biomaterials* 11, no. 2 (2020): 24.

Papavasiliou, J., Paxinou, A., Słowik, G., Neophytides, S., Avgouropoulos, G. "Steam reforming of methanol over nanostructured Pt/TiO2 and Pt/CeO2 catalysts for fuel cell applications". *Catalysts* 8, no. 11 (2018): 544.

Avgouropoulos, G., Paxinou A., Neophytides, S. "In situ hydrogen utilization in an internal reforming methanol fuel cell". *International journal of hydrogen energy* 39, no. 31 (2014): 18103-18108.

CONFERENCE PAPERS

Paxinou A., Zagana P., Boutikos P., E. Tsigalou, and Klapa I.M., Metabolic phenotyping of the CAR-T cell production process, Oral Presentation at 14ο Panhellenic Chemical Engineering Scientific Conference, Thessaloniki May 29-31, 2024 (Oral Presentation).

Paxinou A., Zagana P., Boutikos P. and Klapa I.M., Metabolic phenotyping in cell culture engineering as a tool for optimizing cellular therapies and regenerative medicine methodologies, 21st Panhellenic Congress of Clinical Chemistry, Athens October 12-14, 2023 (Oral Presentation).

Paxinou, A., Karakitsou E., Papantoniou I., Klapa I.M., Metabolomics as a sensitive monitoring tool for CAR-T cell manufacturing process standardization, 72nd Biochemistry & Molecular Biology conference (HSBMB), 2-4 of December Greece, Patra (2022) (Oral Presentation).

Zagana P., Paxinou A., Dimopoulos A., Pantziri M., Papantoniou I., Klapa I.M., Metabolomics as quality control tool in precision manufacturing of micro engineered complex joint implants, 72nd Biochemistry & Molecular Biology conference (HSBMB), Metabolomics as a sensitive monitoring tool for CAR-T cell manufacturing process standardization, 2-4 of December Greece, Patra (2022) (poster).

Paxinou, A. Doctoral Conference, 16th of May, London, University of Westminster, *Development of antibacterial nerve conduits* (2019) (Oral Presentation)-winner award.

Paxinou, A., Salber, J., Roy, I. International Conference on Drug-Free Antibacterial Technology for Medical Applications, *Antibacterial nerve conduits based on PHAs*, 14th December, Cambridge, UK (2018) (oral and poster).

Paxinou, A. Doctoral Conference, 19th of April, London, University of Westminster, *Development of antibacterial nerve conduits* (2018) (Oral Presentation).

Paxinou. A., Salber. J., Roy, I., 29th European Conference on Biomaterials (ESB), *Antibacterial nerve conduits based on PHAs*, 9-13th of September, Maastricht, Netherlands (2018) (poster).

Paxinou. A., Salber, J., Roy, I. European Symposium on Biopolymers (ESBP), *Development of Antibacterial Nerve Conduits*, 5-7 of July, Toulouse, France (2017) (poster).

Paxinou, A., Papavasiliou, J., Neophytides, S., Avgouropoulos, G. *Methanol steam reforming in nanostructure catalysts Pt/TiO_2 και Pt/CeO_2*, 16-18 October 13ο Panhellenic Symposium Ktalysis (2014) (poster).

Paxinou, A., Papavasiliou, J., Paloukis, F., Avgouropoulos, F., Neophytides, S. *Production and use of hydrogen in fuel cell with internal reforming methanol*, 16-18 October 13ο Panhellenic Symposium Ktalysis (2014) (oral)

Paxinou. A, Papavasiliou M., Avgouropoulos, G. *Pt/TiO_2 and Pt/CeO_2 Nanostructured Materials for Fuel Cell Applications, 21-14 September* 30th Panhellenic Conference on Solid-State Physics and Materials Science (2014) (poster) (won poster award).

Paxinou A., Ntoukakis K., Tasis D., Parthenios J., Frank O., Balis N., Lianos P., Galiotis C., Papagelis K., "Transfer of CVD-grown graphene on TiO_2, Teflon and NiTi", XXVIII Panhellenic Conference on Solid State Physics and Materials Science, Patras, September 23-26 (2012) (poster).

SKILLS AND ENRICHMENT ACTIVITIES

- Microbiology, Cell Culture, 3D Printing, Fermentation Technology, Microbial and cell culture bioreactors, Electrospinning, Dip Moulding, Wet Impregnation, Deposition Precipitation, Nanostructure Materials (synthesis and characterization), Catalytic Processes for Fuel Cells Application.

- LC-MS, RAMAN, XRD, DSC, FTIR, GPC, SEM-EDX, DLS, WCA, GS-MS, AFM, CVD, Oxygen Plasma, Tensile Testing, optical, Optical Microscopy (PPL, XPL, UV).

- Microsoft operation system Windows 2000, XP, Vista as well Mac OS X operation system, Microsoft Office, GraphPad, Image J, Origin, Prism, peak-o-mat, MestReNova, SigmaPlot, project management tools, big data analysis.