LARRY O'CONNELL, PhD

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London, UK

QUALIFICATIONS

PhD May 2022
Université Grenoble-Alpes (Hosted by CEA-Leti)

- Developed a bacteriophage-functionalized surface plasmon resonance biosensor for personalized medicine
- Designed and fabricated **a device for electrokinetic mass transport**, manipulation, and sensing of bacterial cells
- Published **five first-author publications**, one co-authorship, conference proceedings, and was awarded a **patent**.

Master of Nanoscale Engineering (*with distinction*) 2017
Institut National des Sciences Appliquées de Lyon

B.A. (Hons) Physics 2013
Trinity College, Dublin

EMPLOYMENT (SELECTED)

CEO / Co-founder 2024 - Present
Microfluidic Systems Ltd.

- Developed and initiated commercialization process for a voice-controlled, AI-assisted pressure based flow controller
- Secured £30K+ in confirmed pre-orders from paying customers in first week of product demos
- Named industry technology partner and primary technical point of contact on £3.5M research consortium alongside top-tier institutions (Oxford, UCL, Imperial College London, University of Leicester); including in-kind pressure-controller equipment and expertise

Postdoctoral Research Associate 2022 - Present
Imperial College London

- Conceived and built a novel, patent-pending tissue culture technology for drug-screening and personalized medicine
- Led a new collaboration and obtained funding to study novel bacteriophage gene therapy vectors
- Advised/supervised interns and students at undergraduate, master's, and PhD level
- Conceived, obtained funding for, and currently developing a novel attomolar bioassay based on hybrid technology of second-harmonic generation and surface plasmon resonance
- Microfabrication, soft lithography, 3D printing

Research Engineer 2018
Institut Lumière Matière, Lyon, France

- Implemented a microfluidic device and two-photon confocal microscopy to recapitulate paracellular transport behaviour and ultrasound opening of the blood-brain barrier for drug delivery applications

Research Engineer 2017
Laboratoire des Technologies de la Microélectronique, Grenoble, France

- Designed microfluidic chips with a novel hydrodynamic flow focusing junction
- Performed CFD modelling in COMSOL
- Carried out soft lithography and 3D-printing for rapid prototyping of microfluidic chips

EMPLOYMENT IN INDUSTRY

Quality Control Analyst — 2014 - 2015

Janssen Pharmaceutica (Johnson & Johnson), Cork, Ireland

- Performed gas chromatography, potentiometric /coulometric /volumetric /Karl-Fischer titration
- Quickly promoted from technician to QC analyst with additional responsibilities in the microbiology department.
- Performed sterility monitoring of critical sterile GMP manufacturing facilities

EVIDENCE OF ESTEEM

- Awarded first place in the Imperial College Advanced Hackspace Hackstarter 2024 programme
- Recipient of the *Projet Avenir Lyon Saint-Etienne* (PALSE) scholarship for my master's studies
- Exceptional grades led me to graduate with a master's *cum laude* with placement at the top of my cohort
- Two first-author articles featured on the cover of *ACS Biomaterials Science & Engineering*

MENTORING & OUTREACH

- Nano@School, CEA-Leti (2020) I co-developed and hosted workshops to introduce lens-free microscopy to MIT undergraduates and local second-level students
- Grenoble-INP Phelma (2020) I mentored master's students studying amoeboid chemotaxis using lens-free microscopy
- Université Grenoble-Alpes (2020-2021) I taught undergraduate chemistry labs through French and English

PUBLICATIONS

- **L. O'Connell**, P. Marcoux, E. Picard, M. Zelsmann; Y. Roupioz. 2023. [**Method for detecting sensitivity of a bacterial strain to phages or to antibiotics**] FR Patent FR2302364, filed March 14, 2023
- **L. O'Connell**, P. R. Marcoux, P. Perlemoine, Y. Roupioz. **Approaching the Geometric Limit of Bacteriophage Conjugation to Gold: Synergy of Purification with Covalent and Physisorption Strategies**. *ACS Biomater. Sci. Eng.* (accepted April 2023)
- **L. O'Connell**, B. Poirier, O. Bratash, C. Plénière, L. Leroy, Y. Roupioz, P. R. Marcoux. **Rapid Fabrication of Interdigitated Electrodes by Laser Ablation with Application to Electrokinetically Enhanced Surface Plasmon Resonance Imaging**. *Optics & Laser Technology* (2023)
- **L. O'Connell**, Y. Roupioz, P. R. Marcoux. **Container Material Dictates Stability of Bacteriophage Suspensions: Light Scattering & Infectivity Measurements Reveal Mechanisms of Infectious Titer Decay**. *J. Appl. Microbiol.* (2022)
- **L. O'Connell**, P. R. Marcoux, Y. Roupioz. **Strategies for Surface Immobilization of Whole Bacteriophages: A Review**. *ACS Biomater. Sci. Eng.* 7, 1987–2014 (2021)
- **L. O'Connell**, Y. Roupioz, P. R. Marcoux. **Optical bacteriophage susceptibility testing by surface plasmon resonance**. *Proc. SPIE* 11661, (2021)
- P. Perlemoine, P. R. Marcoux, [...], **L. O'Connell**, E. Lacot. **Phage susceptibility testing and infectious titer determination through wide-field lensless monitoring of phage plaque growth**. *PLoS One* 16, 1–14 (2021)
- **L. O'Connell,** O. Mandula, L. Leroy, A. Aubert, P. R. Marcoux, Y. Roupioz. **Ultrafast and Multiplexed Bacteriophage Susceptibility Testing by Surface Plasmon Resonance and Phase Imaging of Immobilized Phage Microarrays**. *Chemosensors* 10(5), 192 (2022)