Dr Yuval Elani
Senior Lecturer and UKRI Future Leaders Fellow Department of Chemical Engineering
Imperial College London
Website: https://www.elanigroup.org/ **Email**: y.elani@imperial.ac.uk **Tel:** 02075941208

APPOINTMENTS

Senior Lecturer (Associate Prof), Chemical Engineering Dept. Imperial College	2022 - Present
Founding co-Director of fabriCELL (>40 affiliated PIs)	2018 - Present
Bio-inspired Technologies Group Leader. Currently 4 PDRAs, 20 PhDs	2015 - Present
Co-Director of Membrane Biophysics Platform, c.50 group members	2015 - Present
Lecturer, Chemical Engineering Dept. Imperial College	2020 - 2022
Independent Fellow, Chemistry Dept., Imperial College	2015 - 2020

FELLOWSHIPS

UKRI Future Leaders Fellow, Chemical Engineering Dept. Imperial College	2020 - Present
Imperial College Research Fellow, Chemistry Dept. Imperial College	2019 - 2020
EPSRC Fellow, Chemistry Dept. Imperial College	2016 - 2020
EPSRC Doctoral Prize Fellow, Chemistry Dept. Imperial College	2014 – 2016

QUALIFICATIONS

PhD, Chemical Biology, Imperial College London	2011 - 2015
MRes, Biomedical Physical Chemistry, Imperial College (Distinction, Best of Year)	2010 - 2011
BA, MA (Cantab), Cambridge University**,** Natural Sciences (Chemistry)	2006 - 2009

LEADERSHIP POSITIONS

RSC Biotechnology Group – Committee Member	2023 – Present
SynCell EU – Advisory Board 2023	2023 - Present
Editorial Board – JACS Au , Early Career	2022 – Present
Founding co-Director – Imperial Network of Excellence in Artificial Cell Science	2021 – Present
Member of Executive – IC Centre for Synthetic Biology	2011 – Present
Member of Executive – IC Organ-on-a-Chip Network	2020 – Present
Member of EPSRC Early Career Forum for Engineering (Synthetic Biology)	2018 - Present
Co-Founder & Member of Executive - Leverhulme Cellular Bionics CDT	2017 - Present
Associate Editor, Synthetic Biology, Experimental Biology & Medicine	2017 – 2020

SELECTED AWARDS

- Nicklin Medal, Institution of Chemical Engineers 2023
- Biophysical Science Institute, Judith Howard Prize 2022
- Felix Franks Biotechnology Medal, Royal Society of Chemistry 2021
- Imperial President's Medal for Outstanding Early Career Researcher 2019
- Rita & John Cornforth Medal for Multidisciplinary Science, Royal Society of Chemistry 2017
- World Economic Forum, Emerging Young Scientist;
  "One of the 50 most forward-thinking and advanced young scientific minds in the world" 2017
- Roscoe Medal & Gold Award, Parliamentary & Scientific Committee 2015
- President's Award for Outstanding Research Team (Membrane Biophysics Platform) 2015
- Chemical and Biological Microsystems Society Award 2014
- Lord Porter Prize, awarded by Imperial College for academic excellence 2011

SELECTED INVITED AND PLENARY TALKS (out of > 40 total)

LMS, Converging on Cancer Symposium	2023
Durham Biophysical Science Institute Symposium	2022
Molecular Interactions Bio Conference, Cambridge	2022
BioDesign Automation, Paris	2022
Photon 2022, Nottingham	2022

The Spanish National Research Council, Madrid	2022
Geneva Science and Diplomacy Anticipator	2022
Microfluidics Emerging Investigator Conference	2022
22nd Titissee Conference on Synthetic Life	2021
BioProNET2	2021
BBSRC Mission to Japan	2021
Soft Composite Materials	2021
Living Innovation, Durham	2020
JSPS / Royal Society Frontiers of Science, Tokyo, Japan	2020
SynCell-EU, Madrid	2020
Experimental Biology and Medicine, San Diego	2019
Synthetic Biology Showcase, London	2019
Chemistry Futures Tech Foresight 2040	2019
Loughborough Fluids and Microfluidics Conference	2019
BioMedEng18	2018
IC-CSynB Launch Event	2018
Royal Society Discussion Meeting on Artificial Cells	2018
Rita and John Cornforth RSC Award Symposium, Lincoln University	2018
World Economic Forum, Dalian	2018
Experimental Biology, Chengdu	2018

FUNDING PORTFOLIO HIGHLIGHTS

Total funding secured: > £7.1 M **Funding as PI:** > £4 M

Scheme	Value of Grant	Award Date
Excellence Fund for Frontier Impact Research (PI) *A hitchhikers guide to motility: design rules for swimming BioHybrid micro-robots*	£ 250,000	February 2023
MSCA Doctoral Network (Co-I) *Engineering biological signalling pathways using synthetic cells*	€ 2.4 M	February 2023
BBSRC/ Japan IPAP Plus (PI) *Novel nanotechnologies for on-site expression and reconstitution of membrane-embedded machineries in synthetic cells*	£ 185, 990	January 2023
BBSRC/ Japan IPAP Plus (Co-I) *Top-down meets bottom-up: Designer membrane-less organelles from condensation of synthetic RNA nanostructure*	£187, 130	January 2023
Leverhulme Trust Research Grant (co-I) *Unlocking the mystery of homologous gene recognition using model protocells*	£452,843	June 2022
BBSRC – NSF Lead Agency Grant (PI) *Deciphering the rules of nucleus architecture with synthetic cells and organelles*	£ 675, 955 9 (UK) £ 1.1 M (total)	August 2021
EPSRC Responsive Mode (co – I) *Integrating Living Analytics into Biomanufacturing Processes*	£ 1,088,056	October 2021
EPSRC New Horizon's Grant (PI) *Dial-a-membrane: precision engineering of sub-micron self-assembled materials*	£ 246,296	September 2020
UKRI Future Leaders Fellowship (PI) *An engineering rulebook for interfacing living and non-living cells*	£1,614,845 (yr 1-4); £500 k (yr 5-7)	January 2020
Imperial College Research Fellowship (PI)	£190,000	Dec. 2017
EPSRC Fellowship (PI)	£367,929	April 2016
EPSRC Doctoral Prize Fellowship (PI)	£55,450	October 2014

CITIZENSHIP, TEACHING AND OTHER ACTIVITIES

University Committees
Chemical Engineering Research Committee
Departmental Postdoc and Fellow Champion
Chemical Engineering Equality Diversity, Inclusion and Culture Committee
Chemical Engineering Analytical Services Committee

Active teaching roles
Undergraduate Facilitator in Chemical Engineering Design Projects
Undergraduate Lecturer in Biochemical Sensors
Undergraduate Lecturer in Modelling of Biological Systems
Postgraduate Lecturer in Chemical Biology
Postgraduate Lecturer in Nanomaterials
Postgraduate Lecturer in Synthetic Biology
Postgraduate Examination: 3 PhDs, >30 interim PhD and MRes
Supervisor to c. 2 MEng, 4 MSc, and 4 MRes project students per year

Reviewing activities
Grant reviewer for: ERC, EPSRC, BBSRC, Horizons Europe (amongst others)
Journal reviewer for: Nature Chemistry, Nature Biotechnology, Nature Commutations (amongst others)

Event organisation
Lead organiser for Royal Society Discussion Event on Synthetic Cells
Lead organiser of fabriCELL industry workshop
Co-organiser of Institute of Chemical Biology conference on Biomimetics
Co-organiser of London Centre for Nanotechnology conference on Nanotherapeutics

Memberships
Member of Royal Society of Chemistry
Member of Institute of Physics
Associate Fellow of the Higher Education Academy

Outreach Highlights
Science Museum “Franken-cell” exhibition
Imperial Festival
Imperial Lates
Regular contributor as academic commentator to Chemistry World

Active Industrial Collaborators:
GSK Vaccines, AstraZeneca, Syngenta, Procter & Gamble, Neobe Therapeutics

SELECTED PUBLICATIONS (> 45 papers, 11 1st author, 22 corresponding)

For full publication list, see Google Scholar

Most relevant 15 publications

1. Pilkington, C. P., Contini, C., Barritt, J. D., Simpson, P. A., Seddon, J. M., & Elani, Y. (2022). A microfluidic platform for the controlled synthesis of higher-order liquid crystalline nanoparticles.ChemRxiv DOI 10.26434/chemrxiv-2022-xwq9n-v2
2. Gispert, I.C., Hindley J., Ces, O, & **Elani,Y.*** (2022). Stimuli-responsive vesicles as distributed artificial organelles for bacterial activation. *Proceedings of the National Academy of Sciences*, 119,42, e2206563119
3. Zubaite, G., Hindley, J. W., Ces, O., & **Elani, Y.*** (2022). Dynamic Reconfiguration of Subcompartment Architectures in Artificial Cells (2022). *ACS nano*, *16*, 9389.
4. Allen, M. E., Hindley, J. W., Baxani, D. K., Ces, O., & **Elani, Y*.** (2022). Hydrogels as functional components in artificial cell systems (2022). *Nature Reviews Chemistry*, 6. 562.
5. Zhang, S., Contini, C., Hindley, J. W., Bolognesi, G., **Elani, Y**., & Ces, O. Engineering motile aqueous phase-separated droplets via liposome stabilisation (2021). *Nature communications*, 12, 1673.
6. **Elani, Y.*** Interfacing living and synthetic cells as an emerging frontier in synthetic biology (2021), *Angewandte Chemie*, 60, 5602.
7. Friddin, M., Bolognesi, G., Ces, O., & **Elani Y.*** Direct manipulation of liquid ordered lipid membrane domains using optical traps (2019). *Communications Chemistry*, DOI 10.1038/s42004-018-0101-4

8. Hindley, J.W., Zheleva, D.G., **Elani, Y.,** et al. Building a synthetic mechanosensitive signaling pathway in compartmentalized artificial cells (2019). *Proceeding of the Natural Academy of Sciences*, 116, 16711.
9. Bolognesi, G., Friddin, F., Barlow, B., …. & **Elani, Y.*** Sculpting and fusing biomimetic vesicle networks using optical tweezers (2018). *Nature communications* 9, 1882.
10. Karamdad, K.,Hindley J., Brooks, N.J., & Ces, O, & **Elani Y.*** Engineering thermally-triggered phase-separated vesicles as a content-release platform (2018). *Chemical Science* 9, 4851
11. Hindley, J., **Elani Y**., Bevan, C., Ali, C., & Ces, O, Light-triggered enzymatic reactions in nested vesicle reactors (2018) *Nature communications*, 9, 1093,
12. **Elani, Y.*** Trantidou, T., Wylie, D., Dekker L., Polizzi, K., Law R.V., & Ces O, Constructing vesicle-based artificial cells with embedded living cells as organelle-like modules. *Scientific reports* (2018), 8, 4564, doi:10.1038/s41598-018-22263-3.
13. Trantidou, T., Dekker, L., Polizzi, K., Ces, O., & **Elani, Y.*** Functionalizing cell-mimetic giant vesicles with encapsulated bacterial biosensors (2018). *Royal Society Interface Focus*, 8, 20180024.
14. **Elani, Y.*,** Xavier, C.I., Edel, J. B., Law, R.V, & Ces, O., Microfluidic generation of encapsulated droplet interface bilayer networks (multisomes) and their use as cell-like reactors, (2016), *Chemical Communications* 52, 5961-5964.
15. **Elani, Y**., Law, R. V., & Ces, O. Vesicle-based artificial cells as chemical microreactors with spatially segregated reaction pathways (2014), *Nature communications*, 5, 5305

Other relevant publications

16. Ip, T., Li, Q., Brooks, N., & **Elani, Y*.** Manufacture of multi-layered artificial cell membranes through sequential bilayer deposition on emulsion templates (2021). *ChemBioChem*, doi.org/10.1002/cbic.202100072.
17. Allen, M. E., Albon, J., & **Elani, Y***. Layer-by-layer assembly of multi-layered droplet interface bilayers (2022) *Chemical Communications*, 58, 60.
18. Monck C., **Elani Y.,*** Ceroni F.* Cell-free protein synthesis: biomedical applications and future perspectives (2022). *Chemical Engineering Research and Design*, 177, 653-658.
19. Pilkington, C. P., Seddon, J. M., & **Elani, Y***. Microfluidic technologies for the synthesis and manipulation of biomimetic membranous nano-assemblies (2021). *Physical Chemistry Chemical Physics*, 23, 3693.
20. Pazos, M. D., Hu, Y., **Elani, Y**., Browning, K. L., Jiang, N., & Yetisen, A. K. (2021). Tattoo Inks for Optical Biosensing in Interstitial Fluid. *Advanced Healthcare Materials*, 2101238.
21. Allen, M. E., **Elani, Y.**, Brooks, N. J., & Seddon, J. M.. The effect of headgroup methylation on polymorphic phase behaviour in hydrated N-methylated phosphoethanolamine: palmitic acid membranes (2021). *Soft Matter*, 17, 5763.
22. Lucey, M. et al. (2021). Acylation of the incretin peptide exendin-4 directly impacts GLP-1 receptor signalling and trafficking. *Molecular Pharmacology* .DOI: https://doi.org/10.1124/molpharm.121.000270
23. Vivek, A., Bolognesi, G. and **Elani, Y*.** Fusing Artificial Cell Compartments and Lipid Domains Using Optical Traps: A Tool to Modulate Membrane Composition and Phase Behaviour (2020). *Micromachines*, *11*, 388.
24. Friddin, M.S., **Elani, Y.,** Trantidou, T. and Ces, O. New Directions for Artificial Cells Using Prototyped Biosystems (2019). *Analytical Chemistry*, 91,4921.
25. Ces, O., & **Elani, Y*.** Community building in synthetic biology (2019). *Experimental Biology and Medicine*, 244, 281.
26. Trantidou, T., Friddin, M. S., Salehi-Reyhani, A., Ces, O., & **Elani, Y.*** Droplet microfluidics for the construction of compartmentalised model membranes (2018). *Lab on a Chip*, *18*, 2488.
27. Thomas, J.M., Friddin, M.S., Ces, O. and **Elani, Y.*** Programming membrane permeability using integrated membrane pores and blockers as molecular regulators (2017). *Chemical Communications* 1093, doi:10.1038/s41467-018-03491-7.
28. Trantidou, T., Friddin, M., **Elani, Y**., Brooks, N., Law, R., Seddon, J., and Ces, O. Engineering compartmentalized biomimetic micro- and nanocontainers (2017). *ACS nano*, 11, 6549.
29. Trantidou, T., **Elani, Y**., Parsons, E., & Ces, O., Hydrophilic surface modification of PDMS for droplet microfluidics using a simple, quick, and robust method via PVA deposition, (2017*), Microsystems & Nanoengineering*, 3, 17091.
30. Salehi-Reyhani, A., Ces., O, and **Elani Y.*** Synthetic cell mimics as tools for quantitative biology, (2017), *Experimental Biology and Medicine*, DOI: 10.1177/1535370217711441.
31. Friddin, M.S., Bolognesi, G., **Elani, Y**., Brooks, N.J., Law, R.V., Seddon, J.M., Neil, M.A. and Ces, O. Optically assembled droplet interface bilayer (OptiDIB) networks from cell-sized microdroplets, *Soft Matter*, (2016). *12*, 7731.
32. de Bruin, A., Friddin, M.S., **Elani, Y**., Brooks, N.J., Law, R.V., Seddon, J.M. and Ces, O., A transparent 3D printed device for assembling droplet hydrogel bilayers (DHBs) (2017). *RSC Advances*, 7, 47796.

33. **Elani, Y.*** Construction of membrane-bound artificial cells using microfluidics: a new frontier in bottom-up synthetic biology. *Biochemical Society Transactions*. (2016). 11, 723.
34. Carreras, P., **Elani, Y.**, Law, R. V., Brooks, N. J., Seddon, J. M., & Ces, O. A microfluidic platform for size-dependent generation of droplet interface bilayer networks on rails (2015), *Biomicrofluidics*, *9*, 064121
35. **Elani, Y.**, Purushothaman, S., Booth, P. J., Seddon, J. M., Brooks, N. J., Law, R. V., & Ces, O. Measurements of the effect of membrane asymmetry on the mechanical properties of lipid bilayers (2015), *Chemical Communications*, 51, 6976.
36. **Elani, Y.**, Law, R. V., & Ces, O. Protein synthesis in artificial cells: using compartmentalisation for spatial organisation in vesicle bioreactors, (2015) *Physical Chemistry Chemical Physics* *17*, 15534.
37. **Elani, Y.**, Gee, A., Law, R. V., & Ces, O. Engineering multi-compartment vesicle networks (2013). *Chemical Science*, 4, 3332.
38. **Elani, Y.**, Niu, X., DeMello, A.J., & Ces, O. Novel technologies for the formation of 2-D and 3-D droplet interface bilayer networks (2012), *Lab on a chip*, 12, 3514.