Jack Xiaoyu Chen

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EDUCATION

University of Oxford, D.Phil. in Engineering Science   **2017-2021**

- Thesis title: Engineering Gene Circuits in Probiotics and Minicell for Bacteria Therapy.

Imperial College London, M.Res. in System and Synthetic Biology (Distinction)   **2015-2016**

- Top 6 students. Thesis title: Engineering Synthetic Mammalian Oscillator.

University College London, BSc Biotechnology (1st class honours)   **2012-2015**

- UCL Dean's Award (2014) Ranked in the top 8% of class

Northamptonshire Grammar School, A-levels   **2009-2012**

- Physics, Mathematics, Further Mathematics& Biology: AA*A*A
- National Math Challenge - Bronze Medal (2010)

RESEARCH EXPERIENCE

Massachusetts Institute of Technology, Collins Lab *Postdoc associate* **(Boston, USA) Oct 2021- Aug 2024**

- Led a $2M industrial partnership project to engineer synthetic minicells for cell type-specific delivery and biogenesis of circular RNA.
- Developed high-throughput bioassays for screening IRES libraries and applied reinforcement learning for building programmable logic gates to control protein translation in circular RNA therapeutics.

OSCAR Research Centre, *Research Exchange* **(Suzhou, China)**   **Jul 2020 – Dec 2020**

- Designed automation protocols for high-throughput generation and purification of artificial cells at Oxford's first technology transfer facility outside the UK.

University of Oxford, *DPhil in Engineering Science* **(Oxford, UK)**   **Jan 2017 – Jun2021**

- EPSCR funded project for creating artificial cells for disease diagnosis and in situ treatment.
- Constructed and purified chromosome-free, nanoscale (100-400nm) bioactive artificial minicells.
- Designed multiplex synthetic cells to detect disease biomarkers (nitric oxide) and can be externally controlled via medically relevant methods (Gamma radiation or aspirin injection.).

Imperial College London, *Master research project* **(London, UK)**   **Oct 2015 – Oct 2016**

- Constructed and optimised synthetic mammalian oscillator gene circuit for developing potential gene therapy for atherosclerosis.

University College London, *Final year research project* **(London, UK)**   **Oct 2014 – Apr 2015**

- Constructed in-silico metagenomics database for novel enzyme findings using Expasy, Matlab &Artemis.
- Retrieved novel functional transketolase from human oral microbes with promising results (7 candidates successfully isolated out of 10).

LEADERSHIP ACHIEVEMENTS

Emergence SynBio, *Chief Technology Officier* **(Shenzhen, China)**   **Jan 2024 – Jan 2025**

- Spearheaded a startup project leveraging enzymatic DNA synthesis to produce complex, long DNA fragments, securing a $50M valuation term sheet in 2023.
- Led a team of 12 researchers to develop an automation pipeline and AI-enhanced protein candidates, enabling the synthesis of 1,000,000 base pairs within one week.

Gap Summit 2020, *Leader of Tomorrow* **(Cambridge, UK)**   **Mar 2020 – Oct 2020**

- Entrepreneur competition with 100 candidates (selected out of 800) from around the world to address six key gaps faced by the 21st-century Bioeconomy.
- Pitched and led a team of 8 on the project for rapid COVID diagnosis using CrisprCas-based technology.

SynBio UK, Synthetic Biologists Society, *General Secretary* **(Oxford, UK)**   **Oct.2017 – Oct.2018**

- Organise academic conferences and academic networks for young professionals, building info networks

between Edinburgh, Oxford, Cambridge, Imperial College London and UCL. (+20 team members during presidency)

AWARD & FUNDING

- Hanwha Research Collobrartion Funds ($2,000,000)
- Prize reward, Linnan BigData Competition (£12,000)
- Prize reward - Best Biology, Cambridge Biomake Challenge (£1000)

INDUSTRY EXPERIENCE

Flagship Pioneering Ltd, *Flagship fellowship* **(Boston, USA)** **June 2023 – Aug 2023**
- Conducted interdisciplinary research to identify and develop innovative opportunities for venture creation.
- Delivered five scientific pitches to the director board and senior manager (25+), receiving commendations for creativity, rigour, and potential impact.

ByteDance, *Voyager fellow Synbio Tech Consultant* **(Boston, USA)** **Aug 2022 – Jan 2023**
- Conducted literature review & market research for novel synthetic biology applications in renewable energy and carbon fixation.
- Interview startup cofounders to provide market & technical insights for the investment team.

SIG China, *Synthetic Biology Tech Consultant* **(Oxford, UK)** **Mar 2020 – May 2020**
- Conducted technical due diligence of life-science venture projects for top Chinese VC / Angels
- Provided market, financial, and technology forecasts as well as risk assessments as part of the formal investment memo

Synced Ltd, *Part-time Product Analyst* **(Oxford, UK)** **Mar 2017 – Sep 2017**
- Tech scout and journalist for one of China's top machine-learning media presses.
- Provided weekly case reports of machine learning and automation start-up companies in the UK.

PROFESSIONAL MEMBERSHIP

- American Society for Microbiology (ASM)
- American Chemical Society (ACS)
- American Institute of Chemical Engineers (AIChE)

OTHER SKILLS AND INTERESTS

- Programming skills: Advanced level in MATLAB, Volocity, Artemis, Python and R.
- Language: academic English: Professional. Chinese Mandarin: Native. Japanese: Intermediate.
- Data Science: Online certificate on data specialization by Johns Hopkins University.

SELECTED PUBLICATION

- **Chen.J.X.,** ilia, K, W. Shin. J.J. Collins. Leveraging synthetic biology to engineer bacterial minicells as programmable biomolecule delivery vehicles (2025). Manuscript in preparation
- Wong,F. D,H. A, Krishnan. Hong, L, Wang, A. J, Wang. Z,Hu. K,Ilia. **Chen.J.X**. Zheng,S. Yu,Li. J.J.Collins. Deep generative design of RNA aptamers using structural predictions. Nat. Comput. Sci. 4,829-839 (2024)
- Gayet, R., ilia, K.,Tippens N.,Razavi S.,Chen, J,. **Chen.J.X**. Zhang,K,. J.J.Collins. (2022) Auto-catalytic base editing for RNA-responsive translational control. Nat Commun 14, 1339 (2023). https://doi.org/10.1038/s41467-023-36851-z
- **Chen, J.X**., Steel,H., Wu,Y.H., Wang,Y., Xu,J., Rampley,C.P.N., Thompson,I.P., Papachristodoulou,A. and Huang,W.E. (2019) Development of aspirin inducible biosensors in Escherichia coli and SimCells. Appl. Environ. Microbiol., 10.1128/AEM.02959-18.
- **Chen, J.X**., Lim, B., Steel, H., Song, Y., Ji, M., and Huang, W.E. (2021) Redesign of ultrasensitive and robust RecA gene circuit to sense DNA damage. Microb Biotechnol 1751-7915.13767.
- Song,Y., Rampley,C.P.N., **Chen,J.X**., Du,F., Thompson,I.P. and Huang,W.E. (2019) Application of Bacterial Whole-Cell Biosensors in Health BT - Handbook of Cell Biosensors. In Thouand,G. (ed). Springer International Publishing, Cham, pp. 1–17.
- **Chen. J. X**. Wang B.J. Thompson,I.P. Huang.W.E (2021) Rational redesign and characterisation of nitric oxide biosensors in E. coli Nissle 1917 and minicells. ACS Synbio. doi.org/10.1021/acssynbio.1c00223