LINFENG WANG

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ACADEMIC BACKGROUND

DPhil Biological Sciences (LiDo-DTP)	London School of Hygiene and Tropical Medicine	2021-2025 Expecting
MRes Bioengineering in Stevens Group (Hons) *with Imperial Award*	Imperial College London	2019 – 2020 First-Class Honour with Merit
BSc Biochemistry (Hons)	King's College London	2016 – 2019 First-Class Honour
International Baccalaureate (IB)	International School of Geneva	2014 – 2016 Biology HL – 6 Chemistry HL – 6 English B HL – 6* *out of 7

RESEARCH EXPERIENCE

- 3-year PhD project with Prof Taane Clark, Dr Jody Phelan and Prof Susana Campino. (July 2022 – September 2025)

  Project: *Rapid drug resistance and transmission profiling of tuberculosis using portable genome sequencing technology.*

  Background: 48% of previously treated TB cases show signs of drug resistance. We are currently trying to develop computational tools for drug resistance identification. So far We also aim to apply data analysis technique to solve country specific treatment problems including transmission, regiment & outcome analysis, The methods include: **Python programming, Machine learning, Deep learning, Bash, MCMC, computational phylogenetics, SQL.**

- 5-month PhD rotation project with Prof Taane Clark and Dr Jody Phelan (Oct 2021 – Feb 2022)

  Project: *Genetic Diversity and Drug Resistance of Tuberculosis in the Philippines.*

  Background: Tuberculosis is responsible for 1.5 million deaths in 2020, 16% of new TB cases and 48% of previously treated TB cases show signs of drug resistance. I performed phylogenetic and statistical analysis and created mixed strain fraction prediction models and drug resistance profiling. The methods include: **Python programming, BEAST2, iTOL, gaussian distribution, K-means**

- 5-month PhD rotation project with Dr Matt Silver (Mar 2021 – July 2022)

  Project: *DNA methylation and transposable Element interaction in Human Embryo.*

  Background: Methylation is a common type of epigenetic modification. It is the addition of a methyl group to DNA sequences. They play an important role in the differentiation of tissue and germ layers by selectively controlling the expression of different genes and affecting

transposable elements. I performed statistical analysis to identify methylations that affect foetal development and give rise to different phenotypes, I also performed analysis to find the effect of these methylations and on biological activity. The methods include: **R programming, PCR, linear regression, Correlation test, enrichment analysis**

- 12-month Master of Research with Dr Jonathan Wojciechowski and Dr Eoghan Cunnane supervised by prof Molly Stevens, Imperial College London. (Oct 2019 – Sep 2020)

  Project: *Design of an Artificial Bruch's Membrane from Synthetic Polyesters.*

  Background: During transplantation of retinal progenitor epithelium (RPE) cells to treat retinal degeneration, an optimised delivery system is required to achieve an appropriate cellular organisation that simple bolus injection is unable to provide. I developed polymers with controllable degradation rates and optimised electrospinning for fibrous scaffold formation for RPE transplantation to treat macular degeneration. The methods include: **polymer Synthesis (ROP), Electrospinning, SEM, NMR, data processing/visualisation using python, Image J, *in vitro* degradation**

- 5-month Undergraduate final year project with Dr Andrew Beavil, King's College London. (Sept 2018 – Jan 2019)

  Project: *Investigation of Concordance Between Molecular Dynamics Simulation and FRET Biosensor using Designed Protein Linker System.*

  Background: Förster resonance energy transfer (FRET) biosensor systems are assays developed to measure the separation between one 'donor' fluorophore in the presence of another 'acceptor' fluorophore. Molecular dynamics simulation was used in this project to predict the exact conformational states. I tested the system using inter-domain linkers with self-designed rigid or flexible properties both experimentally and computationally through: **protein design, molecular cloning, plasmid DNA purification, protein purification, TCSPC spectroscopy and molecular dynamic simulations, Gel electrophoresis, PCR**

- 2-month summer project working in the Laboratory of Dr Eugene Makeyev, King's College London, funded by *Wellcome Trust Biomedical Vocational Studentship*. (June – July 2018)

  Project: *How nonsense-mediated decay contributes to gene regulation in developing neurons?*

  Background: Protein PTBP1 represses the inclusion of AS-NMD (alternative splicing induced non-sense-mediated decay), inducing alternative exons in dozens of previously unknown targets, which play important roles in stem cell proliferation, differentiation and survival. I tested the hypothesis that PTBP1-regulated AS-NMD events are critical for proper differentiation of stem cells into neurons, through techniques including: **Gel electrophoresis, PCR, qPCR, bioinformatics analysis of RNA-seq data, mammalian cell cultures, reverse transcription, molecular cloning; RNA purification, primer design**

AWARDS

- *Wellcome Trust Biomedical Vocational Studentship*. (2018)
- *Imperial Award (2020)*
  - *Effective teamwork*
  - *Going above and beyond academic expectations*
  - *Independent open-minded thought*
  - *Self-awareness and active self-management.*

PROFESSIONAL DEVELOPMENTS

- LearnToDiscover.ai certificates (supported by University College London) --- 2023
  - Machine Learning and Modelling in Python
  - Basic Python, Data Handling & Network Science in Python
- Coursera IBM AI Engineering Professional Certificate --- 2021
  - Machine Learning with Python
  - Introduction to Deep Learning and Neural Network with Keras
  - Deep Neural Network with PyTorch
  - AI Capstone Project with Deep Learning

TECHNICAL SKILLS

- Data Science:
  - R: ggplot2, tidyverse,
  - Python: NumPy, Pandas, Matplotlib, Pytorch, Fastai, scikit-learn, RDkit
- Programming languages: Python, R, Bash, LaTeX, Swift, C++ , MySQL, HTML/CSS, Java
- Analytical software: Yasara, Pymol, Snapgene, VMD, Gromacs, MestRenova, Chemdraw, ImageJ, Qtiplot, Graphpad Prism, Kraken
- Bioinformatic web tools: Primer3, UCSC, BLAST, T-COFFEE, Uniprot, Swiss-model, iTOL
- Video editing skill: Final cut, imovie

LANGUAGE SKILLS

- Native Mandarin Chinese
- Native English
- Intermediate French

TEACHING

- Python coding – (London School of Hygiene and Tropical Medicine)
  - Basic python coding and use of data science packages
- TB computational genomics (LSHTM)
  - Use of basic terminal command and tools for analysing TB genome
- Pathogen Genomics workshop (UK, Oversea)
  - Extensive use of terminal command and tools spanning all bioinformatics processes in DNA

WORK EXPERIENCE

- 6-month part-time internship at ByteDance working with VoyagerX project for business prospect analysis of frontier biological technology development.

  My responsibility included:
  1. Biological market research
  2. Scientific research analysis and summary report (Biologics, Neoantigen, small molecules, biological data integration)
  3. Bi-weekly paper reading summary
  4. Interdisciplinary collaboration
  5. Data science related tasks: Data gathering, Data integration, Machine learning

- Organising 3-day retreat events for PhD programme:

  My responsibility included:
  1. Activity planning
  2. Time scheduling
  3. Crowd communication

4. Speaker selection and invitation

- 8-week internship at Syngenta AG headquarter in Basel Switzerland as part of the environment and publicity team (July and Aug 2017)
  Participated in writing the paper: *Multifunctional Field Margins, Assessing the benefits for nature, society and business.*

  My responsibilities included:
  1. Data management.
  2. Composing articles to be posted on the company intranet.
  3. Summarising scientific papers into a more accessible format.
  4. Reading reports critically; forming my own understanding and challenging the ideas.
  5. Presenting and explaining findings.
  6. Attending meetings and analysing problems and proposing next steps.

- Role of Sponsorship officer in Bioscience Student Association at King's College London (2017/18 academic year).

  My responsibility included:
  1. Networking.
  2. Fundraising.
  3. Organising events.
  4. Answering student questions.
  5. Helping new students adapt to university life.

- Role of Peer Assisted Learning Mentor in the School of Life science and Medicine at King's College London (2017/18 academic year).

  My responsibility included:
  1. Lead workshops on learning and organisational methods.
  2. Assist new students with module selection and campus orientation.

REFERENCES

Dr Jody Phelan, London School of Hygiene and Tropical Medicine, Department of Infection Biology. (PhD principal supervisor)
Email: jody.phelan@lshtm.ac.uk

Prof Taane Clark, London School of Hygiene and Tropical Medicine, Department of Infection Biology. (PhD secondary supervisor)
Email: taane.clark@lshtm.ac.uk

Prof Molly Stevens, Imperial College London, Department of Bioengineering. (MRes bioengineering principal supervisor)
Email: m.stevens@imperial.ac.uk

Dr Andrew Beavil, King's College London, Randall Centre for Cell & Molecular Biophysics. (BSc Biochemistry final year project supervisor)
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Prof Brian Sutton, King's College London, Randall Centre for Cell & Molecular Biophysics. (BSc Biochemistry Personal tutor)
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Prof Eugene Makeyev, King's College London, MRC Centre - Developmental Neurobiology.

(2018 Summer project supervisor)
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