Thomas Nok Hin Cheng

Curriculum Vitae

Email: nok.cheng18@imperial.ac.uk/nhcheng@mit.edu ◇ Phone: +44 (0)79 4055 6145 (UK)
Web: https://nhcheng.github.io ◇ Google Scholar ◇ Linkedin ◇ Twitter: @thomasnhcheng

OBJECTIVE

My primary research interests lie at the interface of biomedical science and chemical engineering. Particularly in technologies to understand disease pathogenesis, such as Inflammatory Bowel Diseases, and the translation of discoveries to accessible therapeutics.

EDUCATION

Massachusetts Institute of Technology September 2020 - Present
MIT-Imperial Exchange Student with focus in Chemical & Biological Engineering **CGPA: 5.0/5.0 (Junior Fall)**

- Selected as one of the five undergraduates at Imperial College London to participate in **MIT-Imperial Exchange** program.
- **Relevant Coursework: 6.UAR** Seminar in Undergrad Research (SuperUROP); **20.430** Fields, Forces, Flows in Biological Systems; **20.365** Engineering the Immune System in Cancer and Beyond; **HST.176** Cellular and Molecular Immunology; **HST.S43** Evolution of an Epidemic; **HST.439** Viruses, Pandemics, and Immunity; **HST.539** Interdisciplinary Science in Human Health and Disease

Imperial College of Science, Technology and Medicine October 2018 - Present
Masters of Engineering (MEng) in Chemical Engineering (Expected Graduation: June 2022) **Class Rank: 1/142 (Freshman)**

- **Degree Classification:** First Class Honours **1/133 (Sophomore)**
- **Relevant Coursework:** Biochemistry; Biochemical Engineering; Advanced Bioprocess Engineering; Modeling of Biological Systems
- **Thesis title:**

HHCKLA Buddist Ma Kam Chan Memorial English Secondary School September 2011 - June 2017
Hong Kong Diploma of Secondary Education

- 5** (Highest achievable) in Mathematics, Extended Mathematics, Chemistry and Physics.
- Gap year from Autumn 2017 to 2018 upon graduation to recover from recurring long-standing illness.

RESEARCH EXPERIENCE

Chris Smillie Lab - Massachusetts General Hospital, Harvard Medical School May 2021 - Present
Undergraduate Research Associate at the Center for Computational and Integrative Biology (CCIB)

- Undergraduate research experience to study Inflammatory Bowel Disease

Alex K. Shalek Lab - MIT, Broad Institute, Ragon Institute, MGH September 2020 - Present
Undergraduate Research and Innovation Scholar at the Institute for Medical Engineering & Science (IMES)

- Led the effort to develop compressed drug screening technologies on biological ligands and the modeling of ligand pools.
- Project description: https://superurop.mit.edu/scholars/thomas-cheng/

Rongjun Chen Group - Imperial College London November 2019 - October 2021
Undergraduate Research Assistant at the Centre for Advanced Therapeutics

- Studied, prepared and characterized drug encapsulation with erythrocytes derived vesicles.[7]
- Initiated and directed computational studies on pH responsive bio-polymer PLP-NDA.[6]
- Co-supervised Chemical Engineering undergraduates on the interactions between cell membrane and variants of PLP-NDA.

Jerry Heng Group - Imperial College London June 2019 - June 2020
Undergraduate Research Assistant at the Institute for Molecular Science and Engineering (IMSE)

- Computationally verified and investigated solvent-dependent polymorphism of anti-epileptic drug Carbamazepine.[4]
- Investigated the effect of nanoparticles in inducing Lysozyme crystallization for bio-separation using UV-Vis spectroscopy.[2][3]

TEACHING, PEDAGOGICAL AND LEADERSHIP EXPERIENCE

Chemical Engineering Wiki - Imperial College London January 2020 - Present
Co-founder/Student Partner

- Co-initiated and maintained a student-led wiki containing over 4500 pages of student-created notes, viewed over 100,000+ times.[8][9]
- Awarded Student Contribution & Citizenship Awards from the Department of Chemical Engineering
- More information: https://nhcheng.github.io/newsite/#/teaching

How The Immune System Works - MIT Spark 2021 March 2021

Vaccines, Tests, and Public Health - MIT Spark 2021 March 2021

Social Determinants of Health and Systemic Racism in Healthcare - MIT Splash 2020 November 2020

Undergraduate Teaching Laboratory - Imperial College London June 2020 - August 2020
Undergraduate Research Opportunity Programme (UROP) Participant

- Developed teaching materials for remote teaching during the COVID-19 pandemic, including a partial differential equations course and laboratory modules enabled with augmented reality.[1]

Imperial College Union - Imperial College London October 2019 - June 2020
Chemical Engineering Year Two Academic Representative
· Introduced academic-focused initiatives including a question forum for cohort and answered over 1,000+ questions
· Held tutoring sessions for peers in academic need, during semester and the COVID-19 pandemic.

Pimlico Connection Tutor - Imperial College London October 2019 - March 2020
· Taught STEM subjects at local secondary school weekly to improve the academic knowledge, confidence and interest of underprivileged pupils, whilst giving them an insight into university life.

AWARDS AND ACHIEVEMENTS

MIT Certificate in Advanced Undergraduate Research (2021): Awarded for commitment to a year-long research project
Student Contribution & Citizenship Awards (2021): Awarded for contribution to student life and the ChemEng Department
Procter and Gamble Prize (2020): Awarded to the top student of the year in 2nd Year Chemical Engineering
Second Year Dean's List (2020): Ranking in the top 10 % in the year for 2nd Year Chemical Engineering
Institution of Chemical Engineers Books Prize (2019): Awarded to the top student of the year in 1st Year Chemical Engineering
First Year Dean's List (2019): Ranking in the top 10 % in the year for 1st Year Chemical Engineering

PUBLICATIONS

* Denotes equal authorship

4. Inguva P, Bhute VJ, Cheng TNH, Walker PJ, Introducing students to research codes: A short course on solving partial differential equations in Python, Educ. Chem. Eng. (2021), doi: 10.1016/j.ece.2021.01.011
3. Chen W, Cheng TNH, Li X, Khaw LF, Yang H, Ouyang J, Heng JYY, Protein purification with nanoparticle-enhanced crystallisation. Sep. Purif. Technol. (2021), doi: 10.1016/j.seppur.2020.117384
2. Chen W, Karde V, Cheng TNH, Ramli SS, Heng JYY, Surface hydrophobicity: effect of alkyl chain length, coverage density and network homogeneity. Front. Chem. Sci. Eng. (2020), doi: 10.1007/s11705-020-2003-0
1. Rosbottom I, Cheng TNH, Heng JYY, A Computational Analysis of the Solid-State and Solvation Properties of Carbamazepine in Relation to its Polymorphism. Chem. Eng. Technol. (2020), doi: 10.1002/ceat.202000056

CONFERENCES

3. Cheng TNH, Mead BE, Kummerlowe C, Compressed Screening: High-throughput Phenotypic Screening - The Well Poisoning Effect. (2021) In MIT EECS SuperUROP Showcase 2021.
2. Inguva P, Bhute VJ, Cheng TNH, Walker PJ, Introducing Students to Open-Source Partial Differential Equation Solver Codes in Python. (2021) In 2021 AIChE Annual Meeting (Education Division).
1. Walker PJ*, Cheng TNH*, Maraj M, The use and value of a student-led Wiki towards facilitating peer collaboration in Chemical Engineering. (2021) In Advanced HE 2021 STEM Conference.

SKILLS AND INTERESTS

Skills: *Laboratory* (Flow Cytometry, Cell Culture, Confocal microscopy), *Computer Coding* (MATLAB, Python, R, Julia), *Research Software* (ASPEN, gPROMS, GAMS), *Language* (English, Cantonese, Mandarin, Japanese)

Research Interest: Organoid, Systems Biology, Microbiome, Immunology, Drug Delivery, Statistical Physics, Biophysics, Nanomedicine

Activities: Public Awareness and Social Service Society, Chemical Engineering Society, Japanese Society, MIT Global Health Alliance, MIT Microbiome Club, Imperial College Chess Club

REFERENCE

Professor Jerry Heng
Professor in Particle Technology
Dept. of Chemical Engineering
Imperial College London
E-mail: jerry.heng@imperial.ac.uk

Dr. Rongjun Chen
Reader in Biomaterials Engineering
Dept. of Chemical Engineering
Imperial College London
E-mail: rongjun.chen@imperial.ac.uk

Professor Alex Shalek
Associate Professor
IMES, Chemistry, Koch Institute
Massachusetts Institute of Technology
E-mail: shalek@mit.edu

Dr. Chris Smillie
Principal Investigator
CCIB, Simches Research Center
Massachusetts General Hospital
E-mail: csmillie@broadinstitute.org