Thomas Nok Hin Cheng

Curriculum Vitae

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OBJECTIVE

Raised in Hong Kong, my primary research interest lies at the interface of biomedical science and chemical engineering in which my main goal for a career in research is to develop new technologies to understand disease pathogenesis, such as the mechanistic understandings of Inflammatory Bowel Diseases, and the translation of discoveries to targeted therapies.

EDUCATION

Massachusetts Institute of Technology September 2020 - Present

MIT-Imperial Exchange Student with concentration in Chemical Engineering, Biological Engineering **GPA: 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; 20.465 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 London October 2018 - Present

Candidate for Masters in Engineering (MEng) in Chemical Engineering **Class Rank: 1/142 (Freshman)**

· **Awards:** Institution of Chemical Engineers Books Prize; Procter and Gamble Prize **1/133 (Sophomore)**

· **Relevant Coursework:** Biochemistry; Biochemical Engineering; Advanced Bioprocess Engineering; Modelling of Biological Systems

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.

· A gap year from Autumn 2017 to 2018 upon graduation to recover from recurring long-standing illness.

RESEARCH EXPERIENCE

Shalek Lab - MIT, Broad Institute, Ragon Institute 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 modelling of ligand pools.

· Project description: https://superurop.mit.edu/scholars/thomas-cheng/

Dr. Rongjun Chen's Group, Imperial College London November 2019 - Present

Undergraduate Research Assistant at the Centre for Advanced Therapeutics

· Studied, prepared and characterized drug encapsulation with erythrocytes derived vesicles.

· Initiated and directed computational studies on pH responsive bio-polymer PLP-NDA resulting in a manuscript in preparation.

· Co-supervised five Chemical Engineering undergraduates on the interactions between cell membrane and variants of PLP-NDA.

Professor Jerry Heng's 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.[3]

· Investigated the effect of nanoparticles in inducing Lysozyme crystallization for bio-separation using UV-Vis spectroscopy.[1][2]

TEACHING AND PEDAGOGICAL EXPERIENCE

Chemical Engineering Wiki - Imperial College London January 2020 - Present

Co-founder/Student Partner

· Co-initiated and maintained a student-led wiki to help Chemical Engineering undergraduates with student-created notes.[5]

· More information: https://nhcheng.mit.edu/blog/imperial-chemical-engineering-wiki

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

· Co-taught a class to over 30 motivated high school students to raise awareness on global health equity.

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.[4]

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 and 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

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

1. Inguva P, Bhute VJ, Cheng TNH, Walker PJ, Introducing Students to Solving Partial Differential Equations in Python, Educ. Chem. Eng. (2021), doi: 10.1016/j.ece.2021.01.011
2. 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
3. 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
4. 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

5. 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

REFERENCE

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