

LEUNG, Hoi Fung Lucan

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EDUCATION

Imperial College London | London **Sep 2024 - Present**

Master of Research (MRes) in Neurotechnology

- **Grade:** In Progress
- **Key Modules:** Neuroscience, Medical Device Entrepreneurship, Computation and Statistical Methods, HachEd Programme (Design and Prototyping for Research, Hardware and Electronics Fabrication, Programming)

The Hong Kong University of Science and Technology | Hong Kong **Jan 2024 – Sep 2024**

Master of Philosophy (MPhil) in Life Science

- **Grade** – cGPA: 3.80/ 4.00
(Programme Transitioned in Sep 2024)
- **Key Modules:** Neurobiology, Development and Registration of Pharmaceutical Products, Development and System Biology, Seminar Enrichment, Professional Development for Research Postgraduate, Teaching and Learning Training in Higher Education

Hong Kong Baptist University | Hong Kong **Aug 2019 – Jul 2023**

Bachelor of Science (BSc) in Applied Biology Major in Biotechnology Studies

Minors in Psychology & English Language and Literature

- **Grade:** Second Class Division I Honours Classification
 - ❖ cGPA - 3.36/ 4.00, 3.50/ 4.00 (Final sGPA), 3.42/ 4.0 (Final Year)
(Classification Scale – 1st Class: 3.4/4.0 or above, 2nd Class Division I: 3.0 – 3.39/ 4.0)
- **Academic Honours:** President's Honours Roll - Semester 1, 2019/20 & 2020/21, Semester 2, 2022-2023
Dean's List - Semester 2, 2020/21 & 2021/22, Semester 1, 2022/23
- **Key Modules:**
Biochemistry, Microbiology, Cell Biology, Genetics, Immunology, Molecular Biology, Animal Physiology, Plant Physiology, Fermentation and Enzyme Technology, Animal and Plant Biotechnology, Developmental Biology, Abnormal Psychology, Cognitive Psychology, Positive Psychology, Personality Psychology, Language Studies, Linguistic Theories

MAJOR ACHIEVEMENTS & AWARDS

The Hong Kong Jockey Club Scholarship and Hong Kong Jockey Club Scholar (2020-Present)

- Awarded for Academic Excellence, Intellect, Character, Leadership qualities & Service Commitment

The Hong Kong Baptist University Class Representative 2022/23 (2023-24)

- Recognized for Holistic Excellence, Outstanding Leadership, Community Involvement & Networking Mastery

The MI Asia Award of Outstanding Academic Performance (2023-24)

- Awarded for Academic Excellence & Overall Outstanding Academic Status

The Hong Kong Baptist University Exchange Scholarship & Sponsorship (2020-21)

- Awarded for Academic & English Excellence, Extra-Curricular Achievements, Service, Leadership & Well-Rounded Personality

RESEARCH & TECHNICAL EXPERIENCES

Closed-Loop Brain-Computer Interface for Modulation of Cognitive Functions

MRes – Research Engagement in The Green Group (Neural Bionics Engineering Research)

Principal Investigator – Prof. Rylie Green (UNSW – PhD, Biomedical Engineering)

IMPERIAL

Sep 2024 – Present

In-Ear EEG-Based Design and Fabrication

- Developing Earbuds for long-term usage of In-Ear EEG
 - ❖ Hand processing of formable foam earbuds and multi-layer coating of synthesized conductive elastomer formula
- Singal recordings and system set-up for in-house live clinical experiments
- Planning and designing conductive elastomer-based transcranial direct cortical stimulation via In-Ear EEG and extensions

Tissue-Engineered Neural Interfaces for Implantable Bionics

In vitro and ex vivo experimental engagements

- Primary cell extraction from embryos of mice via dissection
 - ❖ Neural Stem Cell Isolation from dissected tissue of mid-brain
- Cell culturing and formation of neurospheres to provide 3D tissue-like structure to assess neural interface
 - ❖ Planning for ex vivo experiments with neurospheres and tissue slices conjugate to assess neural interface stimulation

Visual Cognition and Behavior in Association with Neural Circuitry of Zebrafish Models

MPhil - Research Engagement in Semmelhack Laboratory (Cognitive and System Neuroscience Research)

HKUST
Jan 2024 – Sep 2024

Principal Investigator - Prof. Julie Semmelhack (UCSD – PhD, Biology)

Cross Breeding, Maintenance, and Preparation of Model Organism in Zebrafish

- Cross-selective targets of Zebrafish to yield transparent larvae for two-photon imaging
 - ❖ Selections of crossing between Wildtype, genetically modified (GCaMP), and Nacre+/- & Nacre-/- Models.
 - ❖ Replacement, monitoring, and control of solution for the new generation of embryos and larvae
 - ❖ Embedment of larvae via agarose on coverslips for imaging in behavioral and two-photon experiments

Observation and Assessment of Visual Processing and Behavioral Response in Larvae via Optogenetics

- Record behavioral responses corresponding to different stimulation and hypothesis
 - ❖ Engage and run Python programming with inputs in modifying selective parameters
- Hypothesize the association of neurological and physiological patterns with defense and fear selection of models

Experimental Set-up Improvement and Fabrication

- Design experimental setup of sample model holding chamber using CAD software (Solidworks, FreeCAD)
- Hardware testing and development using implemented magnetic slide-snap mechanism
- Prototyping of hardware and improvement of setup across multiple generations of designs

Neuronal Differentiation of Adipose-Derived Mesenchymal Stem Cell by Nanomatrices

BSc - Final Year Project (Neuroregenerative Medicine Research)

HKBU
Jul 2022 – May 2023

Supervised by Prof. YUNG K.L. Ken (Oxford – PhD, Neuroscience) & Dr. TAM S.W. Cathy (HKU – PhD, Neuroscience)

Enhanced Stem Cell Proliferation and Differentiation through Nanomatrices

- Investigated the efficacy of patented 2D silicon dioxide nanomatrices with diverse topographical configurations
 - ❖ Employed nanoscale glancing depositing technology to fabricate the nanomatrices
- Utilized the nanomatrices to mitigate stem cell proliferation and the differentiation of adipose tissue-derived stem cells
 - ❖ Evaluated the impact of nanomatrices using the EdU Assay and determined the molarity for DNA synthesis
- Handled primary cells and subsequent cell lines derived from rat inguinal adipose tissue
 - ❖ Conducted extraction, culturing, differentiation, and cryopreservation of cells using Dimethyl Sulfoxide in liquid nitrogen

Mediated Neuronal Differentiation in Stem Cells through Topographical Manipulation

- Cultivated stem cells on nanomatrices to investigate their role in mediating neuronal differentiation.
 - ❖ Explored various configurations, including left, right chiral helix patterns and zigzag patterns with differing pitch heights
 - ❖ Focused primarily on zigzag patterns featuring 165nm pitches
- Observed quantifiable and descriptive characteristics of early differentiated neuronal cells
 - ❖ Increased neuronal markers expression, reduced cell spreading area, miniaturized cell bodies, thin cellular extensions
 - ❖ Noted morphological resemblance with an increased number of cellular extensions and an elongated aspect ratio

Advanced Neuronal Differentiation in Stem Cells through Culture Media Manipulation

- Conducted experiments utilizing different compositions of culture media to enhance neuronal differentiation
 - ❖ Employed Foetal Bovine Serum, Neural Basal (NB), and Neural Basal Plus (NB+) systems as culture media bases
- Adjusted the combination and formula of differentiation media based on the responses of differentiated stem cells
- Observed enhanced neuronal differentiation with NB and NB+ media, characterized by hyperexpression of actin filaments, which were hypothesized to contribute to neuronal differentiation
- Quantified and analyzed statistic results from visualization of immunocytochemistry with paraformaldehyde fixation, fluorescent and brightfield imaging, software ImageJ and Prism

Biotechnology Laboratory Modular Practice

Focus on Neurophysiology, Genetic Engineering, Developmental Biology, Immunology & Endocrinology

HKBU
Feb 2022 – Apr 2023

Neurophysiology & Sensory Systems

- Studied various Purkinje Cells, Dorsal Root Ganglion, Astrocytes and Neuromuscular Junctions via microscopy
- Dissected fish brain in identification of cerebellum, cerebrum, vagal lob, spinal cord, optic lobes and olfactory nerves
- Investigated various reflexes of model frog by noxious stimuli and disruption of brain regions and spinal cord via pithing
- Investigated eye reflexes, spinal reflexes, labyrinthine reflexes, cutaneous system and hearing via various sensory tests

Genetic Engineering & Recombinant DNA Technology

- Proficient in nucleic acid purification, molecular cloning, and bioinformatics analysis
- Skilled Polymerase Chain Reaction (PCR) for screening genetically modified food

Developmental Biology, Applied Immunology & Endocrinology

- Utilized toxin manipulation techniques to examine zebrafish development of morphological features and nervous systems
- Performed in histochemistry, primary cell culturing, and investigation of lymphocyte subpopulations using flow cytometry
- Conducted Transgenesis in *C. elegans* for embryogenesis investigation, trained in immunoelectrophoretic and ELISA techniques
- Conducted gene regulation manipulation and histological examination in rat ovulation studies

Psychology and Language Research Study

Modular investigations in projects, case studies & presentations

HKBU

Sep 2021 – Apr 2023

Cognitive Psychology

- Collaborated in investigation and presentation visual perception and application in the photography of idol Jang Won Young
- Reported and presented the association of emotion, cognition and food with biological and cognitive neuroscience models
- Analyzed case study examples with attention, memory, language processing and intelligence theoretical models

Abnormal Psychology

- Collaborated in investigation and report of psychological disorder of Princess Diana of the British Royal Family
- Presented the case of Princess Diana with the diagnosis of bulimia nervosa by DSM-5 & ICD-11, with possible etiologies and theories in diathesis-stress model, cognitive dissonance, Sternberg triangular theory of love, Erikson's stage of development
- Assessed various case study examples with clinical assessment and diagnosis techniques involving substance-related disorder, schizophrenia, anxiety disorders, obsessive-compulsive disorders and mood disorders

Positive Psychology & Personality Psychology

- Investigated and reported on the association between social intelligence and wellbeing by application and analysis models
- Learnt theoretical and analytical models of positive emotions, relationship, distress and resilience
- Investigated the case of celebrity Chow Yun-fat with Albert Bandura Social Cognitive Theory and Maslow Hierarchy of Needs
- Analyzed personality cases with Psychoanalytic, Neo-Freudian, Humanistic, Trait, Cognitive and Biological approaches

Language Research

- Researched and reported on COVID-19's Impact on the English Language in neologism and semantic shift
- Assessed language neuroanatomically and cognitively with comparison models between primates and cross-cultural human
- Assessed the formation of language in human with phonology, morphology and syntax linguistic approaches

PRESENTATIONS & CONFERENCES PARTICIPATED

The 6th Chinese Computational and Cognitive Neuroscience Conference - *Research Lab Participant, Department of Life Science, School of Science, The Hong Kong University of Science and Technology, 3-5 Jul 2024*

Lingnan University Cognitive Science Conference: From Neurons to Consciousness: The Brain Basis for Cognition - *Research Lab Participant, Department of Life Science, School of Science, The Hong Kong University of Science and Technology, 3 May 2024*

Conference on Application of New Technologies to Nonhuman Primate Models - *Research Lab Participant, Department of Life Science, School of Science, The Hong Kong University of Science and Technology, 25-28 Feb 2024*

"The Effect of Nano-Matrices and Different Differentiation Media on Neuronal Differentiation of Adipose-Derived Mesenchymal Stem Cells" - *Research Projects Presentation, Department of Biology, Faculty of Science, Hong Kong Baptist University, 18 Mar 2023*

MAJOR SKILLS

Personal and Professional Skills

Technical Writing, Cross-cultural Communications & Collaborations, Leadership, Teamwork, Critical Thinking, Cultivated Resilience, Receptivity, Rapid Problem Solving, Attention to Details

Language - English (Fluent), Cantonese (Native), Mandarin (Proficient), Japanese (Basic Proficiency – In Progress)

QUALIFICATIONS

Certificate in Data Analysis Using Python by the University of Pennsylvania (*In progress*)

- Practiced with Data Frames, joining data, and use of libraries with data aggregation, summarization, and visualization.

Certificate in The Brain and Space by Duke University (*Feb 2024*)

- Learned concepts of neurological spatial comprehension from various sensory and motor sources with cognitive abilities

Certificate in Fundamental Neuroscience for Neuroimaging by Johns Hopkins University (*Nov 2023*)

- Learned neuroimaging methods for human research (fMRI, DTI, MRS, PET), neuroscience concepts and terminology

Certificate in Data Science Methodology by International Business Machines [IBM] (Nov 2023)

- Practiced Foundational Data Science Methodology, the CRISP-DM data science methodology, and data applications

Certificate in Python Programming Essentials by Rice University (Nov 2023)

- Experienced and practiced in basic Python programming, concepts in syntax and semantics, and debugging

Certificate in Program for the Gifted and Talented by The Chinese University of Hong Kong (Dec 2012 – Feb 2018)

- Key Modules (105hrs accumulative) – Robotics Engineering, Psychology, Applied Biochemistry, Genes, Cells and Biotechnology

WORK EXPERIENCES & ENTREPRENEURSHIP

Palmoregalo Limited | Co-Founder, Chief Development and Operation Officer

Wellness and Fitness Product Development for Hands

United Kingdom / Hong Kong

Sep 2023 - Present

Key Engagements

- Researched and analyzed associated markets and relevant products in the assessment of product feasibility and competitions
- Cooperated with third parties in the field of physiotherapy, and occupational therapy in consultation with product designs
- Design materials and products including modeling of 3D prototypes with CAD compatible 3D printing and assembly
- Cooperate with prototyping and manufacturing third parties in production with imminent patent approval
- Funding pitch and raise by dilutive and non-dilutive arrangements with various investors including syndicate and crowd
- Project management in aspects of business model development, product design and development, finance and marketing

Secondary and Higher Education Private Tutor

Assignment guidance and lecturing of subject materials

United Kingdom / Hong Kong

Nov 2021 - Present

Key Engagements

- Tutored clients in higher education with community college and university degree backgrounds in groups and individually
- Managed a group of student clients in assignment support and guidance
- Advanced secondary student clients in secondary education grade points by 30% in individual subjects within a year
- Instructed secondary student clients in IGCSE and DSE public examination settings

Hong Kong Baptist University | Student Assistant

International Communication, Cultural Exchange and Integration Management

Hong Kong

Jul 2022 – Jul 2023

Key Engagements

- Managed events in promotion of cross-cultural heritage and international status of the University
- Led and collaborated with internationals in projects that aimed to raise awareness of Hong Kong's intangible cultural heritage
- Hosted international activities as a speaker, performer and model in promotional materials

Roku Moku | Assistant

Tailor made woodwork handicrafts

Hong Kong

Dec 2019 – Jun 2021

Key Engagements

- Cooperated with international companies in developing relevant wooden handicrafts
- Installed woodcrafts at venues and designated destinations, including evening and overnight work

ETRA-CURRICULAR & COMMUNITY SERVICES

IN-LIF-EUS – Co-founded the non-profit multimedia to promote neuroscience and life science public education (Jul 2021 – Present)

Professional Engagement – Imperial Neurotech Seminars and Symposiums (Sep 2024 – Present), HKUST Neuroscience Seminars (Jan 2024 – Sep 2024), BlackRock Neurotech Webinar; *Dr. Sarah Wandelt (Caltech) (Dec 2023)*, HKBU Faculty of Science Distinguished Lecture; *Professor David Clifton (Oxford) (Dec 2023)*, HKJC Community Leader Private Seminars; *Prof. Francis Chan (Dean, CUHK Medicine)*, *Mr. Albert Wong (CEO, HKSTP)*, *Ms. Angel Ng (Head of Asia, Citi Global Wealth)*. HKJC Scholar Dinner with guest; *Mr. Leong Cheung (ED, HKJC)*, *Mr. Gabrielle Leung (ED, HKJC)*. The HKBU Employers Luncheon; *Dr. Clement Chen (Chairman, HKBU Council & Court) (Feb 2023)*. The HKJC Philanthropy for Better Cities Forum as Scholar Representative (Sep 2023 - Present)

Hong Kong Jockey Club Scholars Community Service – Volunteering in activities to resolve local social issues (Jul 2021 – Present)

Project DHL by HKBU – Lead and cooperate with peers in educating biotechnology knowledge in youth crowd (Feb 2021 – Nov 2022)

Peer Mentor, International & Inclusion Student Ambassador Programmes – Led students in Uni-transition (Oct 2020 – Apr 2023)

SLD Awareness Promoter (PATHWAYS FOUNDATION & HKU SPACE) – Sharing insights as SpLDs Alumnus (Jan 2020 – Present)

Competitive Powerlifting: The Hong Kong Powerlifting Team's Selection and Asia Pacific Powerlifting Championship (2021-2023)

KKBOX Campassador Program: Cooperated and project-managed in music promotion, concerts and creative matters (2021-2022)