香港中文大學
The Chinese University of Hong Kong

Programmes of the School of Life Sciences
生命科學學院課程

- Biochemistry
- Biology
- Cell & Molecular Biology
- Environmental Science
- Food and Nutritional Sciences
- Molecular Biotechnology

Faculty of Science | 理學院

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Message from the Director

The School of Life Sciences was established in 2010 under the Faculty of Science by merging the Departments of Biochemistry and Biology, which are among the oldest departments in CUHK. Our School offers six major programmes: Biochemistry, Biology, Cell & Molecular Biology, Environmental Science, Food & Nutritional Science, and Molecular Biotechnology, which have trained over 8400 alumni over the years. Our curriculum is designed to meet the diverse interests of life science students. The students will receive training in fundamental knowledge in life sciences in their junior years, before they specialize into one of the six programmes in their senior years.

In addition to quality teaching, we also strive for excellence in research. For example, two research projects “Plant and Agricultural Biotechnology” and “Centre for Organelle Biogenesis and Function” led by our school have been selected by the University Grants Committee as one of the Areas-of-Excellence in Hong Kong. We believe that the best way to train future generation of scientists is to inspire the students and give them the opportunities to take part in cutting-edge research themselves. To this end, we have the SMART (young Scientist Mentorship And Research Training) and DREAM (Dedicated Research Exchange And Mentorship) programs to allow motivated students to engage in research in local and overseas laboratories. To equip our students with a global perspective and enhance their learning experience in a world-renowned university, we have introduced a Berkeley Biosciences Study Abroad (BBSA) Programme, which enables our students to spend a semester in UC Berkeley.

If you are interested in the science of living organisms - from the structure and function of DNA and proteins to the interactions among living organisms in an ecosystem; from preparing a career in environmental protection, food technologists, or nutritionists to research and development of biotechnological products - you will find our diverse courses and flexible curriculum fit your interests.

– Professor Wong Kam-Bo

Establishment of the School of Life Sciences

Year	Event
1963	Established Department of Biology
1971	Established Department of Biochemistry
1994	Established Environmental Science Programme, jointly by Departments of Biochemistry, Biology, and Chemistry
	Established Food & Nutritional Sciences Programme, jointly by Departments of Biochemistry and Biology
1998	Established Molecular Biotechnology Programme, jointly by Departments of Biochemistry and Biology
2008	Established Cell & Molecular Biology Programme
2009	Launched Life Sciences Broad-based Admission Scheme
2010	Established the School of Life Sciences

Why SLS at CUHK?

High diversity in life sciences

The School provides highly diverse and sophisticated courses in life sciences. Study topics cover from biomolecules to ecology. And the flexible curriculum offered by the School also fits the needs of individual students.

World class education

The extraordinary reputation of our programmes and the excellent quality in education are commended and affirmed by the Quality Assurance Council of the Hong Kong University Grants Committee (UGC).

Excellent research

The School has a marvelous team of teachers who are field-pioneers and outstanding researchers. For instance, our plant biotechnology research is an Area of Excellence, with the establishment of the State-key laboratory of Agrobiotechnology. With a variety of the state-of-the-art equipment and our excellent research personnel, we ensure that our research shall continue to prosper.

Ample opportunities

We provide incomparable undergraduate research opportunities, for instance DREAM and SMART programmes, and these chances are something difficult to find in other institutes. Students will also find numerous exchange and internship opportunities that the learning experience will not be confined to the textbooks and classrooms. A newly introduced Berkeley Biosciences Study Abroad (BBSA) Programme enables selected students to study in UC Berkeley for a term with subsidies. In addition, plentiful of other activities also help to develop the all-round competence. Numerous scholarships are provided to outstanding students throughout the studies.

High internationalization

Our programmes attract local and overseas students. This enables students to appreciate different cultures, hone language skills and grow as confident individuals.

Outstanding career prospects

According to the recent career survey of our graduates, the distribution of the work type of the respondents is as follows: 45% in scientific/research work and medical & health service; 10% in administration/management; 15% in business/commerce; 6% each in environmental science, media and teaching, the rest in hotel/tourism, disciplined service, construction/architecture, human resource/training and logistics/shipping, etc.

High Diversity in Life Sciences

The School of Life Sciences offers six programmes that focus on the study of an extensive range of topics in all aspects of life sciences.

In total, we provide over 130 courses at the undergraduate level for our students. In addition to the lecture courses, more than 40% of the courses the School offers are laboratories courses, workshops, student-oriented teaching courses, independent study modules, and supervised research courses. This wide variety of course format and course content facilitates the establishment of the solid knowledge foundation in life sciences, and fosters the development of students' all-round competence.

Course List for 4-year Cohort (2016-17)

Life Sciences

Course Code	Course Title	Unit(s)
LSCI1000	Biochemistry of Health and Disease	3
LSCI1001	Basic Concepts in Biological Sciences	3
LSCI1002	Introduction to Biological Sciences	3
LSCI1003	Life Sciences for Engineers	3
LSCI2002	Basic Laboratory Techniques in Life Sciences	2
LSCI2003	Scientific Conduct and Ethics	2
LSCI3000	Synthetic Biology Workshop	2
LSCI4000	Literature Research in Life Sciences	3

Biochemistry

Course Code	Course Title	Unit(s)
BCHE2000	Frontiers in Biochemistry	2
BCHE2030	Fundamentals of Biochemistry	3
BCHE2070	Research Internship	2
BCHE3030	Methods in Biochemistry	3
BCHE3040	Proteins and Enzymes	3
BCHE3050	Molecular Biology	2
BCHE3070	Recombinant DNA Techniques	1
BCHE3080	Bioenergetics and Metabolism	3
BCHE3090	Self-study Modules in Biochemistry	2
BCHE3650	Molecular Biology and Recombinant DNA Laboratory	2
BCHE3730	Analytical Biochemistry Laboratory	2
BCHE4030	Clinical Biochemistry	3
BCHE4040	Aspects of Neuroscience	3
BCHE4060	Basic and Applied Immunology	3
BCHE4080	Biochemistry for Forensic Sciences	2
BCHE4090	Biochemistry for Sport and Exercise	2
BCHE4130	Molecular Endocrinology	3
BCHE4760	Immunology and Haematology Laboratory	2
BCHE4830	Medical Biochemistry Laboratory	2
BCHE4901	Senior Experimental Project I	2
BCHE4902	Senior Experimental Project II	2
BCHE4903	Senior Experimental Project III	2

Biology

Course Code	Course Title	Unit(s)
BIOL2120	Cell Biology	3
BIOL2210	Ecology	3
BIOL2213	Ecology Laboratory	1
BIOL2313	Genetics Laboratory	1
BIOL2410	General Genetics	2
BIOL3012	Biodiversity Laboratory I	2
BIOL3022	Biodiversity Laboratory II	2
BIOL3310	Human Biology	3
BIOL3410	General Microbiology	3
BIOL3413	Microbiology Laboratory	1
BIOL3530	Plant Physiology	3
BIOL3560	Biology of Fungi and Non-Vascular Plants	2
BIOL3570	Biology of Vascular Plants	2
BIOL3610	Invertebrate Form and Function	2
BIOL3620	Vertebrate Life	2
BIOL3630	Animal Physiology	3
BIOL3710	Marine Biology	3
BIOL4010	Evolutionary Biology	3
BIOL4012	Field and Environmental Biology	2
BIOL4032	Physiological Investigations	2
BIOL4120	Developmental Biology	3
BIOL4220	Environmental Biotechnology	3
BIOL4260	Conservation Biology	3
BIOL4310	Human Genetics	3
BIOL4510	Hong Kong Flora and Vegetation	3
BIOL4901	Senior Experimental Project I	2
BIOL4902	Senior Experimental Project II	2
BIOL4903	Senior Experimental Project III	2
BIOL4906	Internship	2
BIOL4907	Field Study	2

Cell and Molecular Biology

Course Code	Course Title	Unit(s)
CMBI2200	Literature survey in CMB and Scientific Communication	2
CMBI2500	Research Internship	2
CMBI3010	CMB Laboratory I	3
CMBI3020	CMB Laboratory II	3
CMBI3030	CMB Laboratory III	1
CMBI3040	CMB Laboratory IV	1
CMBI3100	Methodology of Critical Thinking in CMB	2
CMBI3101	Biology of Model Organisms for CMB Research	3
CMBI3200	Proposal Formulation and Creative Scientific Writing in CMB	2
CMBI4001	Protein Trafficking	1
CMBI4002	Protein Folding	1
CMBI4003	Signal Transduction	1
CMBI4101	Cancer Cell Biology	1
CMBI4102	Stem Cell Biology	1
CMBI4103	Neuronal Cell Biology	1
CMBI4201	Genomics and Transcriptomics	1
CMBI4202	Proteomics	1
CMBI4203	Metabolomics	1
CMBI4301	Current Topics in Cell Biology	1
CMBI4302	Current Topics in Molecular Biology	1
CMBI4303	Current Topics in Biotechniques	1
CMBI4901	Senior Experimental Project I	2
CMBI4902	Senior Experimental Project II	2
CMBI4903	Senior Experimental Project III	2

Enviromental Science

Course Code	Course Title	Unit(s)
ENSC2270	Introduction to Environmental Science	3
ENSC2515	Environmental Chemistry	3
ENSC2517	Environmental Chemistry Laboratory	2
ENSC3230	Principles of Environmental Protection and Pollution Control	3
ENSC3415	Environmental Instrumentation Techniques	3
ENSC3417	Environmental Instrumentation Techniques Laboratory	2
ENSC3520	Environmental and Biochemical Toxicology	3
ENSC3820	Environmental and Biochemical Toxicology Laboratory	2
ENSC4210	Environmental Pollution and Toxicology	3
ENSC4240	Environmental Impact Assessment	3
ENSC4242	Environmental Impact Assessment Laboratory	2
ENSC4250	Environmental Health	3
ENSC4310	Methods in Toxicological Research	3
ENSC4510	Methods in Toxicological Research Laboratory	2
ENSC4525	Advanced Environmental Chemistry	3
ENSC4535	Chemical Treatment Processes	3
ENSC4901	Senior Experimental Project I	2
ENSC4902	Senior Experimental Project II	2
ENSC4903	Senior Experimental Project III	2
ENSC4906	Internship	2
ENSC4907	Field Study	2

Food and Nutritional

Course Code	Course Title	Unit(s)
FNSC2001	Introduction to Food Sci & Technology	2
FNSC2002	Nutrition for Health	2
FNSC3001	Food Sci Lab I	2
FNSC3002	Nutritional Sci Lab I	2
FNSC3010	Nutrition and Human Development	3
FNSC3030	Nutritional Biochemistry	3
FNSC3110	Food Chemistry and Analysis	3
FNSC3180	Food Microbiology	3
FNSC4001	Food Sci Lab II	2
FNSC4002	Nutritional Sci Lab II	2
FNSC4110	Food Technology	3
FNSC4120	Community Nutrition	3
FNSC4150	Introduction to Medical Nutrition Therapy	3
FNSC4160	Nutrition Planning and Food Policy	3
FNSC4170	Food Product Development and Quality Control	3
FNSC4901	Senior Experimental Project I	2
FNSC4902	Senior Experimental Project II	2
FNSC4903	Senior Experimental Project III	2
FNSC4906	Internship	2
FNSC5130	Human Physiology	3
FNSC5320	Nutritional Physiology	3
FNSC5430	Food Toxicology and Safety	3

Molecular Biotechnology

Course Code	Course Title	Unit(s)
MBTE2000	Introduction to Molecular Biotechnology	2
MBTE2010	Diversity of Life: Applications and Sustainability	2
MBTE3000	Business and Social Aspects of Biotechnology	3
MBTE4033	Methods in Molecular Biotechnology Laboratory I	2
MBTE4034	Methods in Molecular Biotechnology Laboratory II	2
MBTE4320	Genetic Engineering	3
MBTE4510	Plant Biotechnology	3
MBTE4520	Animal Biotechnology	3
MBTE4530	Microbial Biotechnology	3
MBTE4901	Senior Experimental Project I	2
MBTE4902	Senior Experimental Project II	2
MBTE4903	Senior Experimental Project III	2
MBTE4906	Internship	2

Study Scheme

Starting from 2012, students who wish to choose Biochemistry, Biology, Cell & Molecular Biology, Environmental Science, Food & Nutritional Sciences, and Molecular Biotechnology as their majors are first necessary to enroll in the Science Programme (JS4601). Then, they begin their first phase of study, which comprises the first 3 terms, to strengthen the basic knowledge in general science. In Term 1 and Term 2, students are recommended to finish the Faculty Package which secures a wide exposure to related disciplines. This Package includes 2 introductory courses in life science and chemistry, plus 1 elective course in physics, mathematics or statistics. Afterward, in Term 3, 3 courses on the fundamentals of biochemistry and biology are compulsory to students. These courses well serve as the solid foundations for the subsequent specialized major studies in life science.

General Study Scheme for entrants from 3-3-4 curricular system

Term 1 Term 2 Term 3	**Build up fundamental knowledge** *with Faculty Package in Terms 1 and 2* LSCI1002* + CHEM1280 or CHEM1070 + one course from Maths, Physics, Statistics. *with foundation courses in life sciences in Term 3:* LSCI2002 + BIOL2120 + BCHE2030
Term 4	**Confirm your interest** *Select preferred courses from a list of 14 offered by all 6 programmes* BCHE2000 BCHE3050 BCHE3070 BCHE3650 BIOL2210 BIOL2213 BIOL2313 BIOL2410 CMBI2200 ENSC2270 FNSC2001, 2002 FNSC3180 MBTE2000 MBTE2010
Term 5 Term 6 Term 7 Term 8	**Foster to be a specialist** *Engage in the advanced and specialized study posed by your Major program*

** Students who do not have high school Biology should take LSCI1001 prior to LSCI1002.*

The next phase of the undergraduate study helps to understand in more detail of the 6 major programmes in the School of Life Sciences. In Term 4, students can choose classes from 14 different courses offered by our programmes. To avoid possible overloading, students are recommended not to take more than 13 units of major courses. Nonetheless, this limitation can already accommodate the requirements of up to 3 majors to acquire their preliminary savors. Through this flexible course-selecting scheme, students can comprehend their specific interests in the diverse fields in life sciences and formulate their best fitting choice for the majors.

Course code	Unit	BCHE	BIOL	CMBI	ENSC	FNSC	MBTE
BCHE2000	2	✓					
BCHE3050	2	✓		✓			
BCHE3070	1	✓		✓			
BCHE3650	2	✓					
BIOL2210	3		✓		✓		
BIOL2213	1		✓		✓		
BIOL2313	1	✓	✓	✓			✓
BIOL2410	2	✓	✓	✓		✓	✓
CMBI2200	2			✓			
ENSC2270	3				✓		
FNSC2001	2					✓	
FNSC2002	2					✓	
FNSC3180	3					✓	
MBTE2000	2						✓
MBTE2010	2						✓

[a] choose only ONE laboratory course from BIOL2213, BIOL2313 or BIOL3413 (offered in the second year) for the major requirement of BIO.

Examples of course patterns for the Exploration phase

■ Example 1:

Alan can never resist the temptation from food. Starting from several years ago, the issues of malachite green and nitrofuran residues found in freshwater fish, Sudan dyes in eggs as well as melamine in dairy products had aroused his awareness in the science of food safety. Hence, he decides to major in FNSC.

■ Example 2:

Jackson enjoys nature and outdoor activities. Whenever he has a chance, he would go camping or diving with his friends. However, it frustrates him a lot lately as he can hardly find a nice local place for the activities due to pollution or urbanization. He wonders if he can contribute something to preserve our planet. Therefore, he wants to focus on the study of biodiversity and environmental science.

■ Example 3:

Jenny is interested in the study of DNA and proteins, and wishes to find out more about BCHE, CMBI, and MBTE before she makes a final decision on her major.

Suggested course pattern in second term for:

Example 1: Alan

Course	*Unit*
BIOL2410	2
FNSC2002	2
FNSC3180	3
1 major elective	3
	Total: 10

Example 2: Jackson

Course	*Unit*
BIOL2210	3
BIOL2213	1
BIOL2410	2
ENSC2270	3
	Total: 9

Example 3: Jenny

Course	*Unit*
BCHE2000	2
BIOL2410	2
BIOL2313	1
CMBI2200	2
MBTE2000	2
	Total: 9

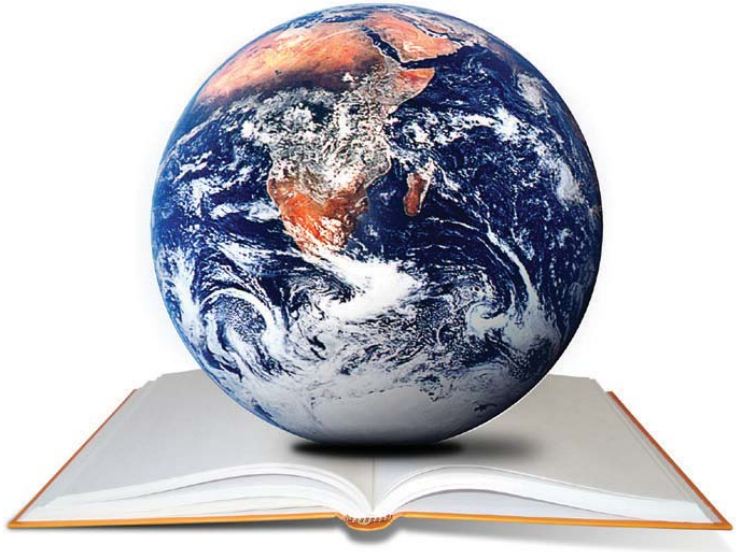
After the second phase of study, students should finalize their decisions on major selection according to their interests. There are 3 occasions on which students can declare their major: after admission, by the end of the first year and by the end of the second year of study. Depending on the pre-defined academic achievements, students can declare their major on any one of the 3 occasions within the first 2 years of study.

Declaration occasion	After admission	End of Year 1	End of Year 2
Condition	*Level 5 or above in HKDSE of*	*C+ or above in*	*Taken (NOT necessarily ALL PASSED)*
	Biology OR Chemistry OR Combined Science (with Biology or Chemistry component) OR Integrated Science OR Technology and Living* (Food Science and Technology Strand only)	LSCI1002	LSCI1002, LSCI2002, BCHE2030 AND BIOL2120

** Apply to FNSC only*

After major declaration, in the final phase which is basically the last 4 terms, students take courses to fulfill the study requirement posed by the specific major to graduate.

World Class Education



The Hong Kong University Grants Committee (UGC) stated that the University *'provides high quality student learning experience that reflects its mission and role statement, underpinned by good quality assurance systems'.*

This merit, of course, is not the only affirmation. Hong Kong Economic Journal Monthly ranked CUHK to be the top among the other UGC-funded universities. The six major criteria included the percentage of PhD holders for academic staff, JUPAS admission results, teaching qualities, financial resources, quality of graduates, and research performance.

Indeed, the faculty members from the School of Life Sciences have been recognized to be commendable that over the last few years, our teachers have been receiving various teaching awards.

Vice Chancellor's Exemplary Teaching Award

Year	Awardees
2002	Professor Lee Sau-Tuen Susanna
2003	Professor Ge Wei
2007	Professor Ge Wei
2008	Professor Leung Kwok-Nam
2012	Professor Kong Siu-Kai

Exemplary Teaching Award in General Education

Year	Awardees
2012	Dr. Chiu Chi-Ming Lawrence

Teachers in the School of Life Sciences

Director

Wong Kam-Bo, PhD (Cantab)
Director, School of Life Sciences
Email: kbwong@cuhk.edu.hk

Research Interests:
1. Structure-function studies of proteins
2. Structure-determination of proteins by NMR spectroscopy and X-ray crystallography
3. Protein engineering and design
4. Simulation and modeling of proteins

Professors

Chan Ho-Yin Edwin, PhD (Cantab)
Director, M.Sc. Programme in Biochemical and Biomedical Sciences
Email: hyechan@cuhk.edu.hk

Research Interests:
1. Cellular, genetic and biochemical analyses of RNA and protein toxicity in neurological diseases
2. Human disease modelling

Chan Michael Kenneth, PhD (UC Berkeley)
Email: michaelkchan88@cuhk.edu.hk

Research Interests:
1. Protein crystallography
2. Chemical biology

Chen Zhen-Yu, PhD (Mass.)
Division Head, Research Postgraduate Programmes
Email: zhenyuchen@cuhk.edu.hk

Research Interests:
1. Cholesterol metabolism and heart diseases
2. Antioxidants and free radicals
3. Fatty acids and health

Cheung Chi-Keung Peter, PhD (NSW)
Associate Director, Food and Nutritional Sciences Programme
Email: petercheung@cuhk.edu.hk

Research Interests:
1. Structure-function of cell wall polysaccharides
2. Bioactive substances from mushroom and edible fungi
3. Chemical properties and biological functions of dietary fiber and prebiotics
4. Functional foods and nutraceuticals

Chu Ka-Hou, PhD (MIT/WHOI)
Director, Biology Programme
Director, Simon F.S. Li Marine Science Laboratory
Email: kahouchu@cuhk.edu.hk

Research Interests:
1. Molecular marine biology and biotechnology
2. Biology of crustaceans

Fong Wing-Ping, PhD (CUHK)
Email: wpfong@cuhk.edu.hk

Research Interests:
1. Structure and function of antiquitin
2. Anti-tumor effects of novel photosensitizers in photodynamic therapy
3. Role of miR-200 in ovarian cancer development

Jiang Liwen, PhD (S. Fraser)
Director, Cell and Molecular Biology Programme
Director, Centre for Cell and Developmental Biology
Email: ljiang@cuhk.edu.hk

Research Interests:
1. Cell and molecular biology
2. Protein targeting and trafficking
3. Plant endocytosis and exocytosis
4. Organelle dynamics and biogenesis
5. Plant biotechnology

Kong Siu-Kai, PhD (CUHK)
Email: skkong@cuhk.edu.hk

Research Interests:
1. Development of biosensors
2. Erythropoiesis and apoptosis
3. Mitochondria as regulators of cell death
4. Cancer biochemistry

Lam Hon-Ming, PhD (Northwestern)
Director, Molecular Biotechnology Programme
Email: honming@cuhk.edu.hk

Research Interests:
1. Genomic study of soybean
2. Identification and characterization of functional genes to improve abiotic stress tolerance and disease resistance in plants;
3. Manipulation of nitrogen sink-source relationship in plants

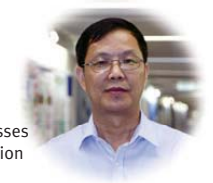
Shaw Pang-Chui, PhD (Lond.)
Director, Biochemistry Programme
Director, Centre for Protein Science and Crystallography
Email: pcshaw@cuhk.edu.hk

Research Interests:
1. Structure-function studies of proteins
2. Authentication and quality control of Chinese medicinal material

Wong Po-Keung, PhD (UC Davis)
Associate Director,
Environmental Science Programme
Email: pkwong@cuhk.edu.hk

Research Interests:
1. Environmental biotechnology and microbiology
2. Environmental technology
3. Ecotoxicology

Zhang Jian-Hua, PhD (Lancaster)
Email: jhzhang@cuhk.edu.hk



Research Interests:
1. Plant physiology and molecular biology under environmental stresses
2. Crop physiology and crop production

Associate Professors

Au Wing-Ngor Shannon, PhD (HK)
Email: shannon-au@cuhk.edu.hk

Research Interests:
1. Protein post-translational modification
2. Macromolecular assembly

Chan King-Ming, PhD (Nfld.)
Director,
Environmental Science Programme
Email: kingchan@cuhk.edu.hk

Research Interests:
1. Aquatic toxicology
2. Molecular endocrinology
3. Marine biotechnology
4. Environmental policy

Chan Ting-Fung Philos, PhD (Wash.)
Email: tf.chan@cuhk.edu.hk

Research Interests:
RNA genomics and bioinformatics:
1. Functions and regulations of non-coding RNAs in biological processes and diseases;
2. Genotype-phenotype relationships in complex diseases or traits;
3. Software development for high-throughput data analysis;
4. Applications in synthetic biology

Chu Lee-Man, PhD (Liv.)
Email: leemanchu@cuhk.edu.hk

Research Interests:
1. Industrial, restoration and urban ecology
2. Pollution studies

Chung Hau-Yin, PhD (Louisiana State)
Associate Director, Food and Nutritional Sciences Programme
Email: anthonychung@cuhk.edu.hk

Research Interests:
1. Food flavor chemistry, analysis and application
2. Natural product, safety, health and application
3. Food evaluation and food product development
4. Soy-based fermented food and seafood

Guo Dian-Jing Diane,
DS (Chinese Acad. of Sc.)
Email: djguo@cuhk.edu.hk

Research Interests:
1. Genomics and bioinformatics
2. Systems biology
3. Plant stress response
4. Plant secondary metabolism and trichome function

Kang, Byung-ho, PhD (Wisconsin-Madison)
Email: bkang@cuhk.edu.hk

Research Interests:
1. Plant cell biology
2. 3D electron microscopy

Kwan Kin-Ming, PhD (HK)
Email: kmkwan@cuhk.edu.hk

Research Interests:
1. Genetic manipulation by transgenic and gene knockout technology
2. Study of organogenesis and tumorigensis
3. Mammalian neural development
4. Stem cell research

Lau Kwok-Fai, PhD (CUHK)
Email: kflau@cuhk.edu.hk

Research Interests:
1. Molecular neuroscience
2. Molecular pathogenesis of neurodegeneration

Lee Sau-Tuen Susanna, PhD (Cornell)
Email: lee2022@cuhk.edu.hk

Research Interests:
1. Nuclear receptor PPAR in health and diseases
2. Phytochemicals as therapeutic targets of metabolic diseases
3. Transgenic animals for disease models

Leung Lai-Kwok, PhD (Kentucky
Director, Food and Nutritional Sciences Programme
Email: laikleung@cuhk.edu.hk

Research Interests:
1. Toxicology and pharmacology of food chemicals

Ngai Sai-Ming, PhD (Alta.)
Email: smngai@cuhk.edu.hk

Research Interests:
1. Bioinformatics and proteomics
2. Protein/peptide structural and functional studies
3. Research and development on modern Chinese medicine

Tsang Suk-Ying, PhD (CUHK)
Email: fayetsang@cuhk.edu.hk

Research Interests:
1. Stem cell biology
2. Derivatives of human embryonic stem cells for therapeutic purposes
3. Ion channels and cardiovascular physiology

Assistant Professors

He Jun-Xian, DS (Lanzhou)
Email: jxhe@cuhk.edu.hk

Research Interests:
1. Plant development and signal transduction
2. Functional genomics and signaling mechanisms of plant stress resistance
3. Improvement of crop yield and quality using molecular biotechnologies

Hui Ho-Lam Jerome, DPhil (Oxon)
Email: jeromehui@cuhk.edu.hk

Research Interests:
1. Organismal biology / Evo devo
2. MicroRNAs in animal developmental biology and evolution
3. Homeobox genes regulation and evolution in animals
4. Invertebrates endocrinology, reproduction and biotechnology
5. Genomics and transcriptomics

Luo Haiwei, PhD (South Carolina)
Email: haiweiluo@cuhk.edu.hk

Research Interests:
1. Molecular evolution of marine bacteria and archaea
2. Microbial genomics
3. Ecological and evolutionary bioinformatics

Ngo Chi-Ki Jacky, PhD (UC San Diego)
Email: jackyngo@cuhk.edu.hk

Research Interests:
1. Structure-function studies of proteins regulating pre-mRNA splicing
2. The roles of splicing kinases in various cancers and viral infections
3. Molecular basis of interactions between kinases and their substrates
4. Structure-function studies of cancer-related proteases

Wong Wing-Tak, Jack, PhD (CUHK)
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Research Interests:
1. Vascular and metabolic biology
2. Stem cell biology
3. Cardiovascular regeneration

Zhong Silin Steven, PhD (Nottingham)
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Research Interests:
1. Genetics and epi-genetics in plant development
2. The roles of transcription factor in hormone signaling
3. Sequencing technology and computational biology

Zhuang Xiaohong, PhD (CUHK)
Email: xhzhuang@cuhk.edu.hk

Research Interests:
1. Plant Cell and Molecular Biology
2. Autophagosome Biogenesis and Autophagy Function in Plants
3. Membrane and Protein Trafficking in Plant Cells

Research Professor

Kwan Hoi-Shan, PhD (UC Davis)
Email: hoishankwan@cuhk.edu.hk

Research Interests:
1. Genomics and functional genomics
2. Food safety and authentication
3. Microbiology, molecular biology and biotechnology
4. Molecular analysis of Chinese medicine and food

Research Associate Professor

Ang Put Jr., PhD (Br. Col.)
Email: put-ang@cuhk.edu.hk

Research Interests:
1. Coral and coral reef biology, ecology and ecophysiology
2. Seaweed ecology, ecophysiology, phylogeography and applications
3. Environmental and functional responses of marine ecosystems

Research Assistant Professors

Chen Li-yuan, PhD (East Anglia)
Email: liyuanchen@cuhk.edu.hk

Research Interests:
1. Plant E3 ligases
2. Stem cells expressed proteins in plants
3. Plant hormone signal pathways

Koon Chun, Alex, PhD (Mass.)
Associate Director, Laboratory of Drosophila Research
Email: alexkoon@cuhk.edu.hk

Research Interests:
1. Synaptic plasticity
2. Neurodegenerative diseases
3. Neurobiology
4. Developemtal biology

Lee Ming-Ming Marianne, PhD (Ohio State)
Email: mariannemmlee@cuhk.edu.hk

Research Interests :
1. Protein
2. Protein delivery
3. Chemical biology

Qin Jing, PhD (HKU)
Email: qinjing@cuhk.edu.hk

Research Interests :
1. Bioinformatics
2. Integrative omics approaches for gene regulation studies
3. Gene regulatory networks
4. Marine genomics
5. Stem cell and cancer multi-omics

Senior Lecturer

Chiu Chi-Ming Lawrence, PhD (HKU)
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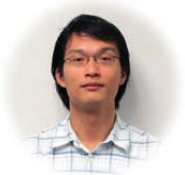
Research Interests:
1. Cell signaling in apoptosis
2. Cancer chemoprevention and chemotherapy with natural products targeting the molecular pathways in carcinogenesis
3. Applications of flow cytometry

Lecturers

Chow Cheung-Ming Cherry, PhD (Oxford)
Email: cmchow@cuhk.edu.hk

Research Interests:
1. Plant cell biology
2. Membrane trafficking
3. Nitrogen metabolism in plants



Lo Fai-Hang, PhD (CUHK)
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Research Interests:
1. Molecular cell biology
2. Cancer research
3. Natural product research
4. Life science research and education methodologies

Ngai Hung-Kui, PhD (CUHK)
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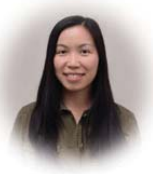
Research Interests:
1. Protein biochemistry
2. Science education



Pang Kok-Shuen Iris, PhD (Yale)
Email: irispang@cuhk.edu.hk

Research Interests:
1. Immunology
2. Immune defense against viruses
3. Commensal bacteria and mucosal immunity

Siow Lam Nina, PhD (HKUST)
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Research Interests:
1. Molecular and cellular neuroscience
2. Cell signaling and gene regulation

Yam Kwan-Mei, MPhil (CUHK)
Email: kwanmeiyam@cuhk.edu.hk

Research Interests:
1. Molecular biology
2. Endocrinology
3. Popular science promotion
4. Learning and teaching methodologies

Assistant Lecturers

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Email: potato@cuhk.edu.hk

Research Interests:
1. Chemical and physical analyses of food materials
2. Food processing technology
3. Food product development
4. Molecular marker for food authentication

Chui Pui Yi, Apple, PhD (CUHK)
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Research Interests:
1. Reproductive and larval ecology of corals
2. Coral recruitment dynamics
3. Restoration ecology of coral reefs

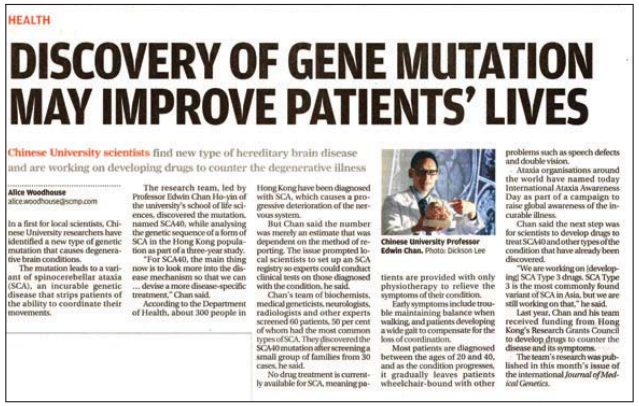
Yip Pui-Sze Peggy, MPH
(Benedictine University),
Registered Dietitian (USA)
Email: peggyyippuisze@cuhk.edu.hk

Research Interests:
1. Nutrition promotion
2. Public health and community nutrition

Excellent Research

Hope for Patients with Spinocerebellar Ataxia

Spinocerebellar ataxias (SCAs) refer to a group of genetic diseases that cause progressive deterioration of the nervous system, particularly the cerebellum (referred to as 'small brain'), and are, at present, considered to be incurable. Sufferers gradually lose the fine motor functions of their bodies and have difficulty maintaining balance or coordinating daily movements.



HEALTH

DISCOVERY OF GENE MUTATION MAY IMPROVE PATIENTS' LIVES

Chinese University scientists find new type of hereditary brain disease and are working on developing drugs to counter the degenerative illness

Alice Woodhouse
alice.woodhouse@scmp.com

In a first for local scientists, Chinese University researchers have identified a new type of genetic mutation that causes degenerative brain conditions.

The mutation leads to a variant of spinocerebellar ataxia (SCA), an incurable genetic disease that strips patients of the ability to coordinate their movements.

The research team, led by Professor Edwin Chan Ho-yin of the university's school of life sciences, discovered the mutation, named SCA40, while analysing the genetic sequence of a form of SCA in the Hong Kong population as part of a three-year study.

"For SCA40, the main thing now is to look more into the disease mechanism so that we can ... devise a more disease-specific treatment," Chan said.

According to the Department of Health, about 300 people in Hong Kong have been diagnosed with SCA, which causes a progressive deterioration of the nervous system.

But Chan said the number was merely an estimate that was dependent on the method of reporting. The issue prompted local scientists to set up an SCA registry so experts could conduct clinical tests on those diagnosed with the condition, he said.

Chan's team of biochemists, medical geneticists, neurologists, radiologists and other experts screened 60 patients, 50 per cent of whom had the most common types of SCA. They discovered the SCA40 mutation after screening a small group of families from 30 cases, he said.

No drug treatment is currently available for SCA, meaning patients are provided with only physiotherapy to relieve the symptoms of their condition.

Early symptoms include trouble maintaining balance when walking, and patients developing a wide gait to compensate for the loss of coordination.

Most patients are diagnosed between the ages of 20 and 40, and as the condition progresses, it gradually leaves patients wheelchair-bound with other problems such as speech defects and double vision.

Ataxia organisations around the world have named today International Ataxia Awareness Day as part of a campaign to raise global awareness of the incurable illness.

Chan said the next step was for scientists to develop drugs to treat SCA40 and other types of the condition that have already been discovered.

"We are working on [developing] SCA Type 3 drugs. SCA Type 3 is the most commonly found variant of SCA in Asia, but we are still working on that," he said.

Last year, Chan and his team received funding from Hong Kong's Research Grants Council to develop drugs to counter the disease and its symptoms.

The team's research was published in this month's issue of the international *Journal of Medical Genetics*.

Chinese University Professor Edwin Chan. Photo: Dickson Lee

Professor Edwin Chan and his team, consisting of biochemists, bioinformaticians, cell biologists, chemical pathologist, medical geneticists, neurologists and radiologist, embarked on a cross-disciplinary study with the aim of unveiling the underlying cause of a familial form of SCA identified in the local population. With a concerted experimental and bioinformatic effort, the researchers finally confined the SCA mutation to the coiled-coil domain containing 88C (CCDC88C) gene. This newly discovered form of SCA has been recognized as 'SCA40'. This work was published in Journal of Medical Genetics, a leading international peer-reviewed journal in human genetics, in 2014. This is the first time that researchers from Hong Kong have identified a novel gene mutation that leads to SCA. The Human Genome Organization Gene Nomenclature Committee, an influential international organization formed by scientists who study human genetics, recently approved the use of 'SCA40' to describe this new type of SCA. This important finding has put Hong Kong on the world map of SCA research, and also shed new light on finding therapeutic directions.

Innovative Platform for Food Authentication

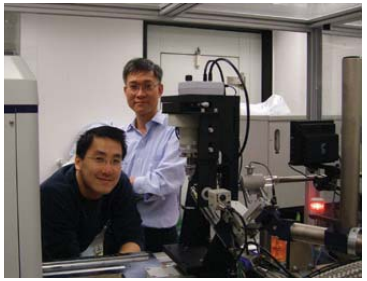
Supermarkets mislabeled oilfish filet as codfish filet. Stores claimed whelk pieces as abalone slides. 'Fraudulent substitutions' is hot in the city. They damage the confidence of both locals and tourists in food products in Hong Kong.

The Innovative and Technology Commission of the Hong Kong Government funded a HK$3 million project 'First-Stage Development of Platform for Authentication of Dried Seafood and Tonic Food Products'. The leader of the project is Professor Kwan Hoi Shan, Director of the Food Research Centre at CUHK. The project aims to develop a database and platform with morphological data and DNA sequences of common dried seafood and tonic food products in Hong Kong. This platform enables the government, local industry, and testing laboratories to monitor food products with DNA sequence markers. The second target of the project is to develop a rapid DNA-based diagnostic kit for species authentication. Laboratories can quickly distinguish genuine products from the fake ones with the database and the kit.

With these efficient quality assurance controls, mislabeling and fraudulent substitution in the local markets can be controlled. The project will contribute to food safety and enhance the reputation of the local food market.

Professor Kwan received a Bronze Bauhinia Star (BBS) of 2012 for his meritorious public and community service, particularly his contribution to promoting food safety and quality assurance.

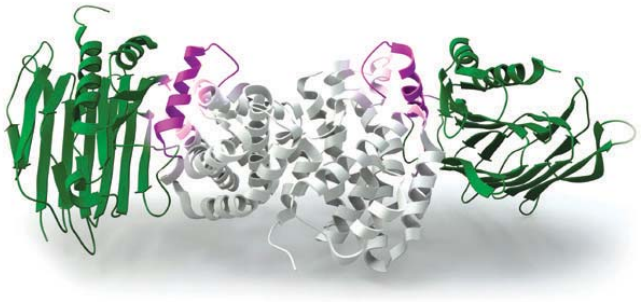
New Way to Battle Stomach Ulcers and Cancer



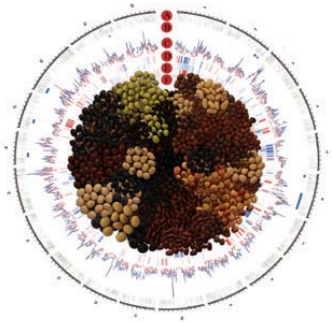
Half of the human population carries *Helicobacter pylori*, the only known bacterium that survives in the extreme acidic environment inside the stomach. This bacterium damages the mucous coating of the gut after which the stomach acid eats away the sensitive organ lining resulting in peptic ulcers. The infection by this bacterium is also well documented to be a high risk factor of stomach cancer. Despite the effective mean with high efficacy of using antibiotics to battle with this bacterium, claims of antibiotic-resistance over the years have urged the development for new therapies.

'The key to the survival of *Helicobacter pylori* in the acidic bath in the human stomach is its use of an enzyme called urease to neutralize gastric acid', said Professor Wong Kam-Bo of the Centre for Protein Science and Crystallography, School of Life Sciences. Urease requires two nickel ions to be functional. Professor Wong and his research team discovered that, using X-ray crystallography to visualize proteins with atomic resolution, the assembly of the urease with the nickel ions involves four helper proteins: UreE, UreF, UreG and UreH. They further revealed that disrupting the formation of the helper protein complex forbids the channeling of the two nickel ions in place and thus inhibits the synthesis of the active urease that is essential to survival.

These conspicuous results have been released lately as 'Paper of the Week' in Journal of Biological Chemistry. Professor Wong said,'With a better understanding on how the molecular machine is assembled, we can now proceed to study ways that dissemble it. As active urease is the key to the survival of *Helicobacter pylori*, new drugs designed to target this complex may well be a novel and viable strategy to eradicate the pathogen.' The team is now designing drugs to inhibit assembly of this molecular machine that keeps *Helicobacter pylori* alive in human stomach.



The Story Inside and Behind the Soybean Genome



Genomic differences between wild and cultivated soybeans (Photo from Prof. Lam Hon-Ming)

Soybean, first domesticated in China, is the third most important cash crop in the international trade market. It is the No. 1 source of vegetable protein, the leading source of edible oils as well as a source of biodiesel. In addition, its high symbiotic nitrogen fixing capacity is environmentally important as its cultivation can naturally replenish soil nutrients.

Currently, more than two-third of the soybean consumed in China is imported. In 2013, total import value of soybean by China had risen to a record high of US$40 billion, mostly from the USA, Brazil and Argentina. However, due to the reduction of arable lands and fresh water resources in China and the world, the production of soybeans could not meet the its growing demand. Adverse environments like salinity also pose severe threat to agricultural productivity. Production of stress tolerant soybeans enables a better use of marginal and low-fertility lands, and hence could promote sustainable agriculture.

Prof. Lam Hon-Ming, Director of the Center for Soybean Research (CSR), has been working on the identification of stress tolerance genes in soybean for more than 10 years. In 2010, Prof. Lam published a cover article in the renowned scientific journal Nature Genetics, reporting the decoding of 31 wild and cultivated soybean genomes that revealed a much higher biodiversity in wild soybeans. In 2014, his team has successfully identified and cloned a major salt tolerance gene from wild soybeans. This finding was recently published in Nature Communications, a multi-disciplinary scientific journal ranked just after Nature and Science. It is a milestone in the mass production of high quality salt tolerant soybeans, a stage reached which will eventually benefit agriculture in China and worldwide.

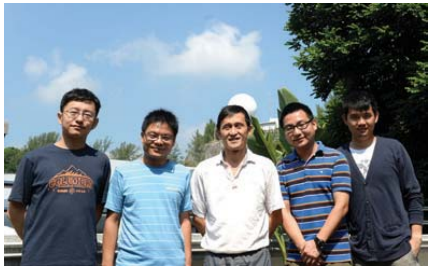
Prof. Lam is now working with soybean breeders in China to produce salinity and drought tolerant soybeans that can be grown on saline and/or arid lands, via non-GM methods. Under his leadership, CSR also holds international soybean symposium for researchers worldwide to facilitate international academic exchanges.

FREE1: A Magic Plant Protein

Cell is the basic unit of life, while the organelles inside the cell are the essential 'organs' of the plant. Each cell contains many different kinds of organelles, while organelle type comprises different proteins to perform their specific functions that control the plant growth and development.

Professor Jiang's research team has been working on the underlying mechanisms of protein transport, organelle biogenesis and function in plant cells for 15 years at CUHK. They have recently discovered a new plant-specific protein (termed FREE1) playing multiple functional roles in regulating protein trafficking, organelle biogenesis and function in plants. FREE1 was shown to 1) Regulate the trafficking of vacuolar proteins, 2) Control the formation of intraluminal vesicles of multivesicular body (MVB), 3) Regulate the vacuole biogenesis and 4) Mediate vacuole-autophagosome fusion and degradation during autophagy in plants. Since vacuole controls many important aspects of crop physiology including seed germination, pathogen defense, and growth under nutrient-limiting conditions, knowledge on the underlying mechanisms of vacuole biogenesis and degradation will provide new tools for crop improvement and plant biotechnology.

These findings, shedding new light on the molecular mechanisms of protein transport, organelle biogenesis and function in plants, have been published recently in two international journals: the Current Biology in 2014 and the Proceedings of the National Academy of Sciences (PNAS) in 2015. Major contributors of this work include Drs. GAO Caiji, ZHUANG Xiaohong, CUI Yong, LUO Ming and Mr. ZENG Yunglin.



Left to right: Cui, Gao, Jiang, Luo and Zeng.

Left to right: Gao, Jiang, and Zhuang.

iGEM – Gold Medal Story

Synthetic biology, a rapidly emerging field that applies abstraction and other important engineering concepts to biological science, has taken the undergraduate science and engineering education by storm. The annual iGEM competition has quickly become the major event that encourages undergraduate student worldwide to spearhead in synthetic biology research.

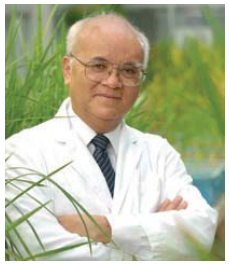
Our iGEM teams consist mainly but not limited to students from the Faculty of Science and Engineering. We work together using synthetic biology experiments to develop their "bio-bricks", the standardized DNA parts tailor-made for different specific tasks, and characterize them systemically and scientifically, we also need to explain their projects to other non-science students and recently to secondary school pupils and the general public. Since the iGEM games are international games, we are able to make contacts with their peers from universities overseas via the Internet and in the virtual competition during the iGEM Jamborees. The games also put emphasis on presentations in oral format, poster format, and the use of wiki pages.

Joining such competition could provide us with opportunities to be at the front row seat to learn the latest development of research field and new techniques outside of the classroom. Most importantly, we also learn how to work together and interact with their peers at top universities around the world. Since 2010, we have obtained 4 gold awards, 1 silver award, and obtained Best New Bio-Brick Part (Natural), Best Bio-Brick Measurement Approach, in 2011 Asia Jamboree (Table 1). Our teams have had many exposures to the general public and mass media through different channels.

Previous iGEM projects of Hong Kong_CUHK and their achievements

Year	*Team Name*	*Specific Project*	*Achievements*
2010	*Bioencryption*	*Using bacterial DNA to store encrypted information*	*World Jamboree Gold Medal*
2011	*ChloriColight*	*Using light-inducible halorhodopsin to transport chloride ion*	*Gold Medal, best bio-brick, best bio-brick measurement, advanced to world jamboree*
2012	*Light of No Return*	*Using light to attract bacteria to move by a light-sensitive protein linked to a signaling pathway to stimulate cell motility*	*Gold Medal, advanced to world jamboree*
2013	*Switch off PAHs*	*Using enzymes to degrade benzo-a-pyrene or other polycyclic aromatic hydrocarbons*	*Silver Medal, advanced to world jamboree*
2014	*ABCDE, AzotoBacter vinelandaii Cluster-transformable Deoxygenated protein Expression*	*Developed a protein expression system in Azotobacter with genome recombination gene transfer cluster mechanism*	*Gold Medal obtained in World Jamboree*
2015	*Magnetosome Forming Azotobacter vinelandii*	*An expression system for the biosynthesis of magnetosomes - prokaryotic intracellular organelles with magnetic properties - in Azotobacter for biotechnology applications*	*Gold Medal obtained in World Jamboree*

Academic Honorees and Awardees



Academician of the Chinese Academy of Engineering and the International Eurasian Academy of Sciences

Professor SUN Sai-Ming Samuel

Professor Sun is the Research Professor of Biology. He joined the University in 1995 and was Chair of the Department of Biology from 1996 to 2004 as well as the Founding Director of the Molecular Biotechnology Programme from 1998 to 1999. He has also been the Director/Coordinator of the UGC-AoE Centre for Plant and Agricultural Biotechnology (former as Plant and Fungal Biotechnology Centre) since 2000, Director of Institute of Plant Molecular Biology and Agricultural Biotechnology since 2006, Director of State Key Lab of Agrobiotechnology (CUHK) since 2008, and Master of S. H. Ho College since 2009.

Professor Sun's research interests encompass a number of areas such as plant gene isolation, characterization, transfer, expression, and regulation; plant bioreactors; as well as rice quality improvement and functional genomics. Professor Sun is credited as the scientist who first cloned a plant gene, discovered plant gene intervening sequences, and enhanced an essential amino acid in plant through biotechnological approach.

Croucher Senior Research Fellowship

Professor JIANG Liwen

Dr. Jiang joined CUHK Biology as an Assistant Professor in 2000 and was promoted as Professor in 2007. Professor Jiang is currently Choh-Ming Li Professor of Life Sciences of School of Life Sciences and Director of RGC-AoE Centre for Organelle Biogenesis and Function, as well as Director of Centre for Cell and Developmental Biology. Professor Jiang's research team has been working on the underlying mechanisms of protein transport, organelle biogenesis and function in plants for 15 years at CUHK, and has been internationally recognized as a leading group in the field. Professor Jiang received numerous awards for teaching and research achievements, including CUHK Science Faculty Exemplary Teaching Award 2008, CUHK Research Excellence Award twice (2006-07 & 2009-10), Croucher Senior Research Fellowship twice (2009-10 & 2015-16), Ministry of Education (MOE) Higher Education Outstanding Scientific Research Output Awards twice (2009 & 2013), Outstanding Fellow of the Faculty of Science (2013) and Choh-Ming Li Professorship of Life Sciences (2014). Graduate students from Professor Jiang's lab have also received many prestigious awards, including CUHK Young Scholars Dissertation Award (twice), Postgraduate Research Output Award (four times), Keystone Symposium Scholarship (twice) and Human Frontier Science Program Long-Term Fellows (twice).

As PI/PC, Professor Jiang has received competitive research grants worth over HK$70 million from the Research Grants Council of Hong Kong, the Croucher Foundation and other important funding bodies. Professor Jiang has also served as editorial board member of several international journals, including *The Plant Cell, Molecular Plant, BMC Plant Biology, Protoplasma, and Journal of Genetics and Genomics.*

Research Grant Council (RGC)-funded Collaborative Research Fund

In the last three years, the School of Life Sciences received both the AoE and CRF funding from RGC to build upon our existing strengths and develop them into Areas of Excellence (AoE) and to fund projects with significant potential to develop into an area of strength.

AoE Project:

Professor Liwen Jiang and his team received an AoE grant of HK$47.25M to establish the Center of Organelle Biogenesis and Function beginning in January 2014.

CRF Project:

Professor Liwen Jiang and his collaborators were awarded HK$7.36M for "EXPO (Exocyst-positive Organelle): Dynamics, Biogenesis and Functions in Plants". Professor Jiang has just been awarded HK$8.36M for "EXPO and Autophagosome in Plants".

Professor Hon-Ming Lam and his collaborators were funded HK$6.99M for "Genomic and Molecular Studies of a Salinity Tolerance Locus in the Wild Soybean Genome".

Professor Edwin Chan was granted HK$7M for his project titled "Targeting RNA and Protein Toxicities of Polyglutamine Diseases Using Peptidylic Inhibitors".

Professor KH Chu was awarded HK$7.2M for his project "Marine Genomics: Crustacean Evolution and Aquaculture"

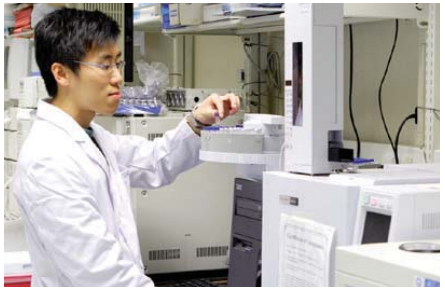
Other Research Awards

Research Excellence Award

Year	Awardees
2006-2007	Professor Jiang Liwen
2007-2008	Professor Chu Ka-Hou
2008-2009	Professor Chen Zhen-Yu
2009-2010	Professor Jiang Liwen
2012-2013	Professor Lam Hon-Ming

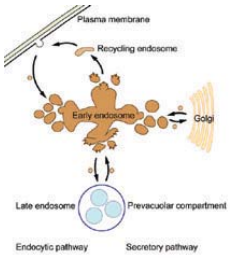
CUHK Young Researcher Award

Year	Awardees
2008-2009	Professor Kwan Kin-Ming
2009-2010	Professor Chan Ho-Yin Edwin



Research in the School

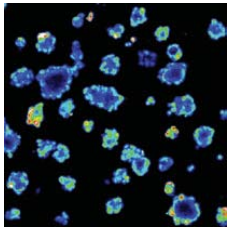
The School of Life Sciences engages actively in a wide array of research areas. They vary from as small as a molecule to as large as a habitat.



Cell Biology

This covers a wide range of interdisciplinary areas in life sciences that explain the molecular and cellular organization, and how the signaling pathway regulates cellular function. Major topics include signal transduction, cell fate, neuroscience, stem cell biology, and cancer cell biology.

Molecular mechanisms of protein trafficking in the plant secretary and endocytic pathways provide hints for using plants as bioreactors for producing pharmaceuticals.



Recent development of stem cell research focuses on the basic biology and biomedical application of embryonic stem cells that aim to identify possible strategies for clinical uses.

Cancer cells were discovered to be capable of recovering after exposure to a chemical cocktail that triggers programmed cell death. This finding could potentially help the development of new, more effective anti-cancer drugs.

Neuroscience is the biology of nervous system, which allows us to sense and respond to the external environment. Our neuroscience research actively investigates the pain hypersensitivity, neuronal differentiation, and the pathogenesis of nervous system diseases, for instance, Alzheimer's and Parkinson's Diseases.

Ecology and Environmental Science

One of our research areas is in the discipline of wildlife conservation and habitat restoration. Analyses of ecosystem functioning, bioindicator assemblages, and microbiological status are the key attributes of the desirable ecological changes in terms of the ecosystem integrity and health, which are of primary concern in the ecological restoration. We also investigate vegetation composition and ecological succession on fly-ash lagoons and used municipal landfill sites for better habitat restoration.

Enzymes from fungi and microorganisms are studied for the bioremediation of sites polluted by toxic organic matters. We also study the contaminations of metals and trace organics in the coastal areas and inland waters.

Marine Science

A number of nuclear protein-coding genes are used as DNA markers for resolving the phylogenetic relationships among the decapods crustaceans such as shrimps, lobsters and crabs.

The studies of dolphin, coral communities, and seaweed are underway in local marine parks. Impacts of climate change on marine ecosystems are also of our concerns.

Food & Nutritional Sciences

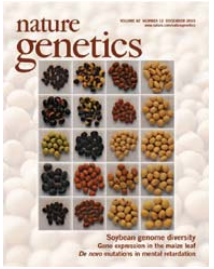
Nutritive food ingredients, like lipids and dietary fibers, and non-nutritive chemicals isolated from plant foods are investigated for their potential benefits in prevention of chronic disease development.

The palatability of food depends on our sensual perception. Key food chemical ingredients interacting with our sensory receptor are investigated.

To tackle diseases that have not yet been cured by modern medicine, several members in the School are working on functional foods and nutraceuticals. The neurological, anti-tumor, and immunomodulatory effects of the active compounds isolated from traditional Chinese medicines and functional foods are examined at gene and protein levels, using pathway guided, genomic and proteomic approaches.

Genomics & Bioinformatics

The Human Genome Project has brought enormous technological breakthroughs in sequencing technology that give rise to a new area of research focusing on the sequence, structural, and functional analysis of the genome of all living organisms. The importance of genomics is best exemplified during the SARS outbreak in 2003. CUHK researchers deciphered the SARS-coronavirus genome isolated from the patients, and investigate how it mutates from the stain in palm civets. A number of professors in our School specialize in different aspects of genomic research such as evolution, population genetics and epigenetics, in a wide-range of living organisms with particular strengths in human, crustacean, and plant genomics.

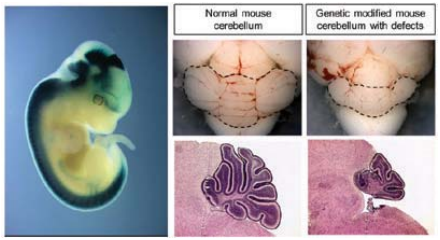


Plant & Agricultural Science

The SKL team and the researchers from the member laboratories at the SKL 2014 Annual Meeting. The current director and deputy director are Prof. Jianhua Zhang and Prof. Hon-Ming Lam (front row, 7th and 9th from left, respectively).

Achieved international excellence and obtained the official approval from The Ministry of Science and Technology of P.R. China, SLS members established the **State Key Laboratory (SKL) of Agrobiotechnology**, in partnership with the prestigious China Agricultural University in 2008. This SKL, comprised 16 principal investigators from CUHK and 5 associate members from other local Universities, has received a support totalled $19M (2011-2016) from the Innovation and Technology Commission. This national-level laboratory has a mission to up-scale China's agricultural technology to the world frontier for increasing agricultural productivity, safeguarding food security in China, improving people's nutrition and promoting cooperation between China and Hong Kong on scientific advancement. Prioritized research areas include the development of stress tolerant, high-quantity, high-quality and high value-added crops via the application of state-of-the-art technologies such as genomics, proteomics, metabolomics and recombinant DNA approaches.

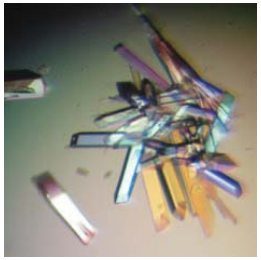
Developmental Biology



How can a single cell (fertilized egg) develop into a multicellular organism with specialized structures and organs? This question also becomes a very important medical question.

A newborn may possess some tragic abnormality when the embryo development goes wrong as shown in the figures as some genes are mutated by genetic engineering technology. The knowledge of normal development is the base for understanding abnormal developmental diseases.

This area of study is made possible by the advanced molecular biology, cell biology, and genetic engineering technology. The mammalian embryonic developmental process is studied with mouse as the model organism.



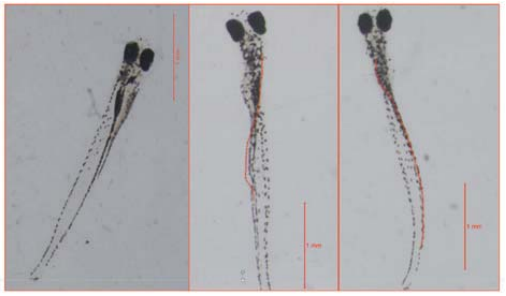
Protein Science

In this post-genomic era, protein structure-function study is of major importance in understanding the molecular basis of cellular pathways and developing therapeutic targets. Our ongoing research projects focus on proteins in cellular signaling and biomedical science, pathogenic microorganisms, and are of biotechnological significance.

Toxicology

The research of toxicology and health centres on liver metabolism and detoxification enzymes of drugs and environmental toxicants, chemical carcinogenesis, and the development of biomarkers of effects from chemical toxicants.

Effects of environmental pollutants, such as metals, pesticides, and trace organics on liver metabolism of fish and rats are investigated. Sophisticated techniques involved in the toxicology research include the differential gene expression and proteomic studies, molecular toxicological approach with the use of gene cloning and DNA array as well as the use of enzyme markers or reporter gene systems for the evaluations of potential health risks of the environmental contaminants including endocrine disruptors. Both mammalian models and fish models are being used for toxicity assessments.



Deformity observed in zebrafish larvae exposed to Brominated Diphenyl Ether (BDE)-47

Research Institutes and Centres

- Centre of Plant Molecular Biology and Agricultural Biotechnology
- Centre for Cell and Developmental Biology
- Centre for Protein Science and Crystallography
- Food Research Centre
- Simon FS Li Marine Science Laboratory

Ample Opportunities

Internship, Scholarship and other opportunities

BBSA

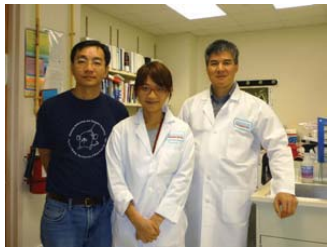
The Berkeley Biosciences Study Abroad (BBSA) Programme is newly introduced to enable upper year students of our School to spend a semester in UC Berkeley. They can take 12 units of upper level Integrative Biology and Molecular & Cell Biology courses there and the credits can be transferred back to CUHK to fulfill their graduation requirements. Selected students will be awarded subsidies for tuition fee in UC Berkeley.

DREAM

The Dedicated Research Exchange And Mentorship (DREAM) Programme provides precious opportunities for our students to expose to the frontiers of biological researches. Our students first participate in a coaching programme, and learn the basic techniques and background information related to the project from a local supervisor in the School. During summer, as sponsored by the School, they travel abroad and conduct research projects in foreign laboratories or corporations. Participating institutions and corporations in 2015 include University of California at Davis, Institute of Molecular Biology, Academia Sinica, and the Law Offices of Albert Wai-Kit Chan, University of Tübingen, University of California of Riverside, University of Oklahoma, Brock University, Institute of Biological Chemistry and Biodiversity Research Center, Academia Sinica, etc.

SMART

The new Young Scientist Mentorship And Research Training (SMART) Programme specifically offers a distinguished research experience to first year students. Through individual guidance from Professors in research laboratories, students are able to ignite their inquisitiveness in scientific research at the very beginning of the university journey. Besides, they may also receive up to $3300 as rewards for working in the research laboratory.



University Student Sponsorship Programme

"Thanks to the University and Ocean Park Conservation Foundation, we went to Bohol, the Philippines for a 10-day cetacean survey. During the survey, the Pilipino cetacean experts led us to the sea along a designated line transect. On the boat, three members took turn every hour to actively search for the signs of dolphin and whale with binocular. During 2-week survey, we spotted countless dolphins and whales, ranging from small Fraser's Dolphin to enormous Pilot Whale, and from active Spinner Dolphin to the shy Melon-headed Whales. Besides, 10-meter Whale Shark, water birds, different kinds of fishes and numerous marine organisms were also encountered. This trip brought us to the nature and to be face-to-face with the wild animals that we can never experience and see in Hong Kong! What's more, it was a valuable chance for us to experience the threat human posed on our beloved ocean. After this trip, we would definitely be more actively engaging ourselves in the conservation of our ocean!"

2011 participants – Lam Ka-Yiu Eric (ENSC) and Le Ga-Wun (BIOL)

"It is really an unforgettable experience to participate in a bird population research. Sponsored by Ocean Park Conservation Foundation, we stayed in a forest of Cebu, the Philippines for 14 days to look for an endemic endangered bird species Black Shama Copsychus cebuensis. These birds make long melodious call, and they are only found in Cebu with a population of around 3000. During the 14-day stay, we learnt bird ringing and radio-telemetry. In fact, what we learnt most was to appreciate the nature. A forest contains various types of vegetation, and is home for numerous animals. It is always joyful to live with the forest, the lovely animals and the stunning natural environment in harmony."

2010 participant – Chow Ming-Him (ENSC)

Good Internationalization

Every year, the University attracts excellent secondary students both from local and overseas. Currently, the University has close to 2,000 international students from countries and regions: all over the world. The School of Life Sciences admitted 232 students in 2015/16.

Outstanding Career Prospects

The diverse training by the School prepares our graduates to not only feature in areas related to their studies, but also find their starring paths in areas outside life sciences.

Interviews of Alumni

Biology programme at CUHK was my top choice for my undergraduate study. It offered a broad curriculum as well as special topics in life science that provided me a very good foundation for my graduate study in marine biology as well as the scientific knowledge, training, skills of logical and critical thinking for my career as a Senior Fisheries Officer in the government.

1991 Alumnus (Biology) - Chow Wing-Kuen
Senior Marine Conservation Officer, Agriculture, Fisheries and Conservation Department of the Government of HKSAR

I would like to say thanks to all my teachers for their guidance, support, and also the research opportunities such as the summer research programme and the internship programme that prompted me to apply to graduate school for more intense graduate research training. The study at CUHK not only provided me with a platform to acquire textbook knowledge of biochemistry, but most importantly enabled me to appreciate its beauty of the scientific knowledge. Being a professor at CUHK now, in addition to fostering responsible students and researchers, one of my anticipated roles is to make sure that the knowledge of biochemistry and life sciences can reach different strata of our society, and ultimately everyone can apply scientific knowledge to their work positions and daily lives.

1995 Alumnus (Biochemistry) – Chan Ho-Yin Edwin
Professor, School of Life Sciences, CUHK
Faculty Exemplary Teaching Awardee
Young Researcher Awardee
Genetics Society of China Thirteenth Ju-Chi Li Animal Genetics Prize winner

I am glad that I chose FNSC at CUHK as my undergraduate major. In addition to the solid knowledge on food science and nutrition from the coursework, the soft skills, like trouble-shooting and communication skills, creativity, and passion benefited my career development. The summer lab and undergraduate final year research programme are something in particular to mention as they allowed me to gain early exposure to food laboratory environment.

1997 Alumnus (Food and Nutritional Sciences) – Leung Arnold
Senior Food Scientist, the Coca-Cola Company

Though there is no direct linkage between my major and my current occupation, the more in-depth knowledge in biological science, environmental science and geography help my understanding and analyses towards issues related to environment and life science. These definitely facilitate the formulation of more thorough news reports.

2000 Alumnus (Environmental Science) – Pun Wai-Lam
Senior Reporter, TVB

Look back the time when I chose my major at CUHK, I believed that following my own personal interests would give no regrets to my life, so I devoted to Science, and MBT was my first choice as I really like the idea of DNA and genes. MBT program has given me wonderful University life, the Professors are inspiring and the lab courses are practical, well-equipped me with scientific knowledge, critical thinking and laboratory techniques. Final year project has also trained me to be a careful, tough, logical and optimistic person. After graduation, I further studied at the CUHK Graduate School, and went to both Canada and USA for a period of post-doc training. Luckily, now I got my faculty position at the Macau University of Science and Technology, and have the opportunities to run my own lab and research projects. After so many years, I am still very proud of being the first year of MBT graduates as it has started my scientific career as a Scientist, and I believed that I had made the best choice.

2001 Alumna (Molecular Biotechnology) - LEUNG Lai Han, Elaine
Assistant Professor
Macau Institute for Applied Research in Medicine and Health
Macau University of Science and Technology

When I entered the MBT programme in 1998, I was completely new to the field of molecular biotechnology. I then progressively acquired state-of-the-art molecular biotechnology knowledge through a multitude of ways, including lectures, site visits, summer internship, as well as being a student helper in the laboratory of well-established scientists. Now being a teacher and molecular virologist myself, I am offering these similar ways to train and nurture a new generation of our future scientists. Without doubts, the MBT programme will be a perfect stage for those who are seeking to develop and shine in the golden age of biotechnology.

2001 Alumnus (Molecular Biotechnology) – Chan Chi-Wai Martin
Research Assistant Professor
Department of Microbiology, The Chinese University of Hong Kong

To me, the program offered broad knowledge of fundamental science and ample opportunities to translate what I had learnt into practical research projects. Interactive lab courses, group projects, presentations, and diverse program activities are features of this program, which allowed us to develop independent thinking, teamwork, and effective communication. I believe the program will continue to thrive and foster talents who will shine in different fields.

2002 Alumna (Molecular Biotechnology) – Lam Hung-Ming
Assistant Professor, University of Washington, Seattle
Young Investigator Award, Prostate Cancer Foundation
Career Development Award, Pacific Northwest Prostate Cancer SPORE, NCI/NIH
Idea Development Award (New Investigator), Department of Defense'

I am glad that some 10 years ago I put CUHK Food and Nutritional Sciences programme as my first priority in my JUPAS form. Not mentioning its multi-disciplinary curriculum (including food science and technology, nutrition, biochemistry, biology etc) provided me with solid scientific knowledge, the programme also trained me with a variety of soft skills particularly critical thinking, which are still very useful in my everyday work. In addition, the programme offered a lot of great laboratory research opportunities, especially food technology and product development as well as final year project, which helped me to learn effectively in a practical and fun way!

2003 Alumnus (Food and Nutritional Sciences) – Ma Ka-Ming
Scientific Officer, Food and Environmental Hygiene Department, HKSAR Government

The critical piece of mind acquired from project work and assignment work, comprehensive thinking and good communication/presentation skills obtained from lab report and project works, and persistence and a piece of mind to serve the community learnt from the final year project are some of the critical generic skills that were trained by my major programme. These figured me into an enthusiastic territory educator to inspire students in Science Education of the next generation. I broke my school's 11 years of record with the highest credit rates and full passes for my classes. Some of my graduates have joined the School of Life Sciences at CUHK in these several years.

2005 Alumnus (Biology) – Ho Tik Shun
Head, Department of Science, The Chinese Foundation Secondary School

The curriculum in FNSC at CUHK is not only beneficial to my career but also my life. The series of food safety and microbiology courses built up my knowledge, prepared me well to win the job as a Health Inspector and granted me competitive advantage in my career. On the other hand, the nutrition related ones allowed me to live a healthier life though I was not in that field. Not to mention, the inspiring and heartfelt ways of teaching and interactive learning enabled me to see and think from different angles. Also thanks to the FNS academic visit and excursion programs which have led my eyes beyond the locality and allowed me to exchange the experience with counterparts of food and nutritional sciences in other countries.

2006 Alumnus (Food and Nutritional Sciences) – Chan Yun-kwan
Health Inspector, Food and Environmental Hygiene Department of the Government of HKSAR

Learning interesting facts about food and nutrition, doing labs, cooking for new food products – I would say studying in the FNS programme was one of the most enjoyable time in my life. It has also paved the way for my career of becoming a registered dietitian. FNS teaching staff were supportive and helped me meet all the essential requirements to enroll into the overseas dietetics master's programme. The knowledge acquired from the FNS programme was useful and practical, which enabled me to often excel in the postgraduate study of dietetics. Our FNS dietitian alumni were very helpful too by sharing their experiences in overseas dietetic study and real-life work as a local dietitian. I would like to take this good opportunity to say "thank you" to you all.

2006 Alumnus (Food and Nutritional Sciences) –Wong Sze-Man Candy
Dietitian, Hospital Authority
Master of Science in Nutrition and Dietetics, the University of Sydney
Accredited Dietitian, Hong Kong Dietitians Association
Accredited Practising Dietitian, Dietitians Association of Australia

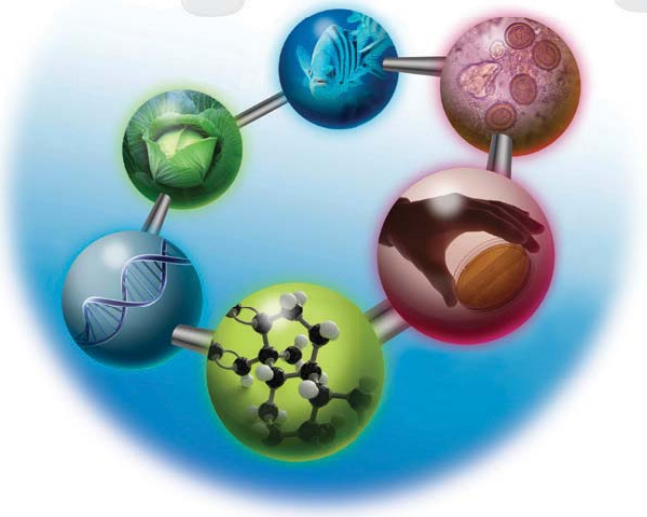
The programme equipped me with knowledge, both theoretical and practical, of current advances in the field and skills for conducting research in life sciences. These prepared me well for the study of M. Phil that facilitated my job hunting in the education field after graduation. The training also allows me to share the current development in the field with students both from the view of researchers as well as public health which is hot in Liberal Studies.

2007 Alumnus (Biochemistry) – Ho Lilian
Graduate Master/ Mistress, Holy Trinity College

After graduation, I continued my study in the finance areas, and obtained my Master degree in Finance and the Advanced Diploma in Professional Financial Planning. I am now working in the area of financial planning engaging in the wealth and relationship management. Financial world is full of uncertainties. Strong and independent logical thinking and scientific method I acquired from my undergraduate study benefit my judgment in deciphering the reason and finding out the answers for these uncertainties. I particularly thank the inspiration provided by my programme for the scientific and personal growth.

2007 Alumnus (Biology) – Mok Kai-Cheung Steven
Chief Wealth Management Advisor, Convoy Financial Services Limited
Swiss Privilege – Financial Planning Top 10 Awardee
Hong Kong Institute of Bank – Financial Planning Competition Awardee

Programmes in the School of Life Sciences



Biochemistry
Biology
Cell and Molecular Biology
Environmental Science
Food & Nutritional Sciences
Molecular Biotechnology

Background

Biochemistry is a branch of science that investigates the chemical compounds and processes occurring in living organisms at molecular level. The knowledge procured from the study in biochemistry has found extensive applications in medicine and biotechnology that drastically revolutionize our daily life.

In 1971, the University established the Department of Biochemistry (now the Biochemistry programme), and it quickly became a strong programme in teaching and research. The study of Biochemistry in the School comprises a broad array of scientific disciplines, including the chemistry of life processes, bioinformatics, the metabolism of biomolecules and their regulation, energy transformation, the functions of enzymes and the structure-function relationship of enzymes and proteins, genome research and genetic diseases, heredity and evolution, the mechanisms of the nervous, immune and endocrine systems, biotechnology, and biomedical sciences.

Mission

- To provide concepts and mechanisms of biochemical processes, with emphasis on clinical and biomedical sciences
- To provide training on the latest biochemical technology
- To cultivate the ability of critical thinking, a proactive and responsible attitude and efficient communication skills for high competitiveness in further study and in the job market

Career Talks given by Alumni

Curriculum

Biochemistry (BCHE)

Study Focus:

- Genetics and Cell Biology
- Protein and Enzymes
- Bioenergetics and Metabolism
- Methods in Biochemistry and Molecular Biology
- Biomedical and Health Sciences
- Independent Research

Elective Areas:

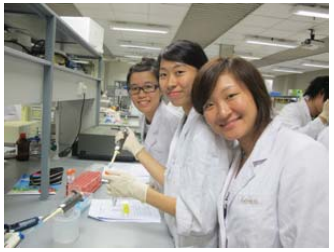
- Independent research in Biochemistry
- Self-study modules in Biochemistry
- Clinical Biochemistry
- Immunology
- Endocrinology
- Neuroscience
- Forensic Sciences
- Sport Sciences
- Advanced topics offered by SLS programmes:
  Biology: Microbiology, Animal Physiology, Human Genetics
  Cell & Molecular Biology: Protein Trafficking and Folding, Stem Cell Biology, Cell Biology of Cancer and Neuronal System
  Environmental Science: Biochemical Toxicology, Environmental Health
  Food & Nutritional Sciences: Medical Nutrition Therapy, Nutrition and Human Development
  Molecular Biotechnology: Animal Biotechnology
- *Statistics:* Biostatistics

Curriculum Highlights

- Current topics in biochemistry and molecular biology that have scientific, medical and social significance
- Self-study modules and independent research opportunity

Expected learning outcomes

- Understand the core knowledge in biochemistry covering biomolecules, molecular biology, cellular biochemistry, metabolism, bioinformatics, proteins and enzymes
- Gain the knowledge of the latest biochemical technology in clinical biochemistry, immunology, neurosciences, biotechnology, endocrinology, sport and forensic sciences, genomics and proteomics
- Possess skills in designing experiments to test hypothesis, writing research report, applying their knowledge to daily life, and developing self-learning capability
- Become all-round competent



Views of current students

The curriculum of Biochemistry programme covers different aspects of biochemistry. I can choose topics in which I am interested for in-depth study. There are also abundant opportunities for students to participate in a research project. This helps to develop my critical thinking skill. Apart from academic studies, I have also enjoyed the different activities organized by the Biochemistry Society, which make my university life more enjoyable and fruitful.

Chan Wai-Wa

My interest in clinical biochemistry and biomedical sciences got me to choose Biochemistry as my major. Having a marvelous teaching team and many interesting study topics, the programme provides quality education and numerous research opportunities for us. These help to equip me in many different aspects like research and communication skills.

Wan Tsz-Yau

Biochemistry 40th Anniversary High Table Dinner

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Background

Biology is a broad field embracing many different disciplines, which include the study of living organisms from virus to human. Fundamental to the study of life is unfolding biological organization at its many levels, from molecular architecture to ecosystem structure. During the past few decades, new discoveries in biology has have brought significant impact on the way we live. Armed with exciting new research methods and information from genomics of human and other living organisms, biologists are beginning to unravel some of life's most engaging mysteries.

The Department of Biology, now the Biology Programme, was established in 1963, and is one of the oldest departments in the University. Indeed, we are the first biological sciences department in Hong Kong awarded the Area of Excellence by University Grants Committee. We offer a broad range of subjects for students to choose from, including genetics, physiology, plant biology, zoology, marine biology, and ecology.

Mission

- To prepare students for careers in biological sciences and related fields
- To provide students with knowledge on the latest developments and advancements in biology
- To promote excellence in teaching and research in all levels of biological sciences from molecular to organismal biology

Studying the stream ecology through field investigation

Examining the floral structures

Appreciating the value of plants in a campus walk

Investigating biodiversity at a rocky shore

Curriculum

Biology (BIOL)

Study Focus:

- Ecology
- Genetics
- Biodiversity
- Fundamentals of Biochemistry & Cell Biology
- Fundamentals in Organic Chemistry, Mathematics, and Physics

Elective Areas:

- Microbiology, Evolutionary Biology, Plant, Marine & Animal Biology, Developmental Biology, Conservation Biology, Physiology, Field Study
- Advanced topics offered by other programmes:
  Biochemistry: Bioenergetics and Metabolism, Molecular Biology, Immunology, Endocrinology
  Cell & Molecular Biology: Protein Trafficking and Folding, Stem Cell Biology, Cell Biology of Cancer and Neuronal System
  Environmental Science: Pollution and Toxicology
  Food & Nutritional Sciences: Food Microbiology
  Molecular Biotechnology: Molecular Biotechnology
  Statistics: Biostatistics

Curriculum Highlights

Three recommended packages based on the different combinations of the courses offered by Biology Programme: (1) Organismic Biology; (2) Human Biology; and (3) Biology for Teaching Career.

Winter Camp

BBQ gathering of students and teachers

Expected learning outcomes

- Acquire basic knowledge in all aspects of biological sciences and in-depth understanding in at least one major area of biology
- Develop skills in scientific problem solving, statistics and information technology
- Understand the latest developments and advancements in biology
- Appreciate the importance of biological conservation and environmental issues

Views of current students

After finishing my associate degree in Health Studies at HKCC, I joined CUHK due to its diverse choices in life sciences. Finally, I picked Biology as my major because I think Biology is a very interesting topic and the knowledge acquired helps prepare myself to further study in biomedical sciences, such as musculoskeletal medicine and rehabilitation.

Yau Man-Ho

The Biology Programme offers numerous courses which cover many topics in biological sciences from tiny microscopic cells to the macroscopic ecosystem, and it also has study packages which help us plan our career path upon graduation. In addition, career talks are organized by the Biology Society annually for our better understanding towards possible job opportunities.

Leung Hill-Tone Jessica

Sampling water from the sea

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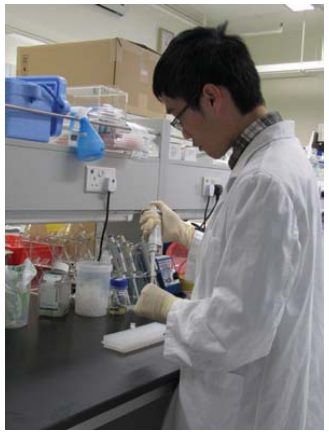
Cell & Molecular Biology

Background

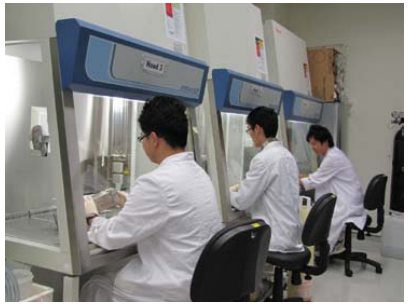


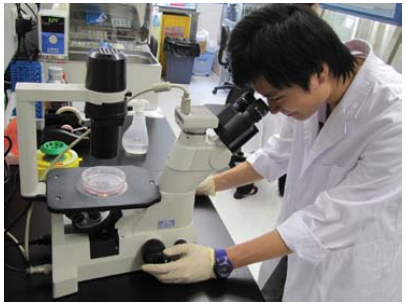
Cell and molecular biology is the foundation of contemporary life sciences and represents the frontiers of modern biology and biomedicine. With the completion of genome projects in human and an increasing number of different organisms, the focus of modern biology is quickly shifting to functional genomics which aims at understanding the functions of genes at molecular, cellular, and organism levels.

It is in this background that the University proudly launched the new Cell and Molecular Biology programme in 2008. As the first programme focusing on cell and molecular biology in the region, we target to train superior professionals that fulfill the increasing manpower demand for the cutting-edge researches in the fields of cell biology and molecular biology. These advanced scientific disciplines include stem cell biology, cancer cell biology, neurobiology, signaling transduction, and developmental biology.

Mission

- To provide the best education and training that prepare students with professional research competence in biological and biomedical sciences as well as biotechnology
- To become a regional education centre with international recognition and a premier research hub for cutting-edge research in cell and molecular biology





Curriculum

Cell and Molecular Biology (CMBI)

Study Focus:

- Research methods and Scientific communication
- Stem Cell Biology, Cell Biology of Cancer and Neuronal System
- Genomics, Transcriptomics & Metabolomics
- Contemporary topics in Cell Biology and Molecular Biology

Fundamentals in Biochemistry and Genetics

Fundamentals in Organic Chemistry, Mathematics, and Physics

Elective Areas:

- Independent research in Cell & Molecular Biology
- Advanced topics offered by other SLS programmes:

  Biology: Physiology, Developmental Biology

  Biochemistry: Clinical biochemistry, Neuroscience, Immunology

  Molecular Biotechnology: Animal, Plant and Microbial Biotechnology, and Genetic Engineering
- Biomedical Engineering offered by the Faculty of Engineering
- Statistics: Biostatistics

Curriculum Highlights

- STOT courses conducted in either a small class or 1 student-on-1 teacher basis
- Intensive project-based lab training
- Extensive coverage of contemporary and advanced topics in cell and molecular biology on top of the solid knowledge in life sciences

Expected learning outcomes

- Acquire solid subject knowledge in the fields of cell biology and molecular biology
- Comprehend laboratory skills essential for a research career
- Possess all-round competence

Views of current students

This one-to-one STOT learning scheme provides students with an extraordinary angle to appreciate the wonderful scientific world. Family-like atmosphere in CMB allows good interactions among teachers, staff and students. The project- based CMBI lab courses are fascinating. Not only that we learnt the essential techniques for molecular cloning, we also worked with plant cells and mammalian cells for our cell biology projects.

Ma Tsz-Ching Charlotte

Marvelous teaching team, nice research facility, interesting study topics, and constructive career development are some of the many reasons that I would recommend CMB to you. The skills in writing, presentation, critical thinking, and scientifi c research have well prepared me to be a scientifi researcher.

Kwok Chun-Ho Leo

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Background

Environmental Science is an integrated science using the basic knowledge and skills of applied biochemistry, biology and chemistry to assess and resolve environmental problems. In response to the growing public concerns about the environmental protection and conservation issues, the University established the Environmental Science programme in 1994.

We foster our students with training in ecology, environmental chemistry, pollution control, waste management, biodiversity, conservation, toxicology and health, energy research, environmental impact assessment, and policy development. Our body of lecturing staff comprises professors from the School of Life Sciences and Department of Chemistry, as well as other professionals from related disciplines. In addition, our Advisory Committee, composed of the specialists from the Government, industries, and other academic sectors, also provides precious advice on curricular matters, thus improving the relevance of our graduates to the local need in particular, and that of overseas as well.

Mission

- To provide wide multidisciplinary background in environmental sciences with good communication skills
- To cultivate high level of competence in scientific understanding of environmental issues with creative idea in solving environmental problems
- To train our students with the appropriate professional techniques in addressing different environmental issues

Curriculum

Enviromental Science (ENSC)

Study Focus:

- Ecology
- Environmental Chemistry & Instrumentations
- Environmental Impact Assessments
- Environmental and Biochemical Toxicology
- Internship

Elective Areas:

- Chemistry in Biofuels
- Chemical Treatment Processes
- Conservation Biology
- Environmental Biotechnology
- Environmental Protection & Pollution Control
- Environmental Health
- Field Study
- Hong Kong Flora and Fauna
- Marine Biology
- Methods in Toxicological Research
- Electives from other programmes

Curriculum Highlights

- Elective courses from the Department of Geography and Resource Management in Faculty of Social Science and the Public Health Programme in Faculty of Medicine, such as, Urban Environmental Problems, Ecosystem Restoration and Management, Hydrology and Water Resources, Biostatistics, Soil Science, Environment and Health, etc.
- Elective courses from Chemistry and Earth System Science in Faculty of Science, and Energy Engineering in Faculty of Engineering, such as Energy Utilization and Human Behavior, Atmospheric Science, Chemistry in Biofuel, etc.

Expected learning outcomes

- Understand the core knowledge covering environmental chemistry, biological conservation, toxicology and environmental impacts
- Develop to be an active researcher and professional in various aspects of environmental science with innovative ideas
- Adapt to fast-changing social environment to stay competitive in job market and be aware of the latest developments in environmental policy and issues

Views of current students

I am a final year student studying environment science. Throughout my three-years university life, my undergraduate curriculum enables me to learn a wide variety of environmental management and protection topics, I have gained extensive knowledge in my studies and developed as a multi-dimension thinker. I have found an area in which my curiosity and my ability are suitably paired. In my final year, I have taken Direct Research Project for strengthening my laboratory skills and independent working ability. Furthermore, it would be a valuable to have a preliminary experience being a scientist. This programme provides a number of elective courses from other relevant department, field studies, as well as encouraging the development of aspiring environmentalists directly in classroom and laboratory.

Mak Chu Wa

I am a first year student in ENSC. Classmates are friendly and willing to help in the programme. In this year, I have learnt basic knowledge about the environmental problems and their solutions, which are essential for me to work in the environmental aspect later on after graduation.

Siu Hoi-Ying

Career prospect

Half of our graduates directly involve in environmental related jobs after graduation. They work in government departments, consulting firms, green groups, and commercial sectors focusing on various aspects of environmental issues, from green purchasing, carbon audit, to environmental impact assessments and tree management. Other graduates become post-graduate students or find jobs in schools as teachers, in the business sectors as administrators or marketing officers.

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Food & Nutritional Sciences

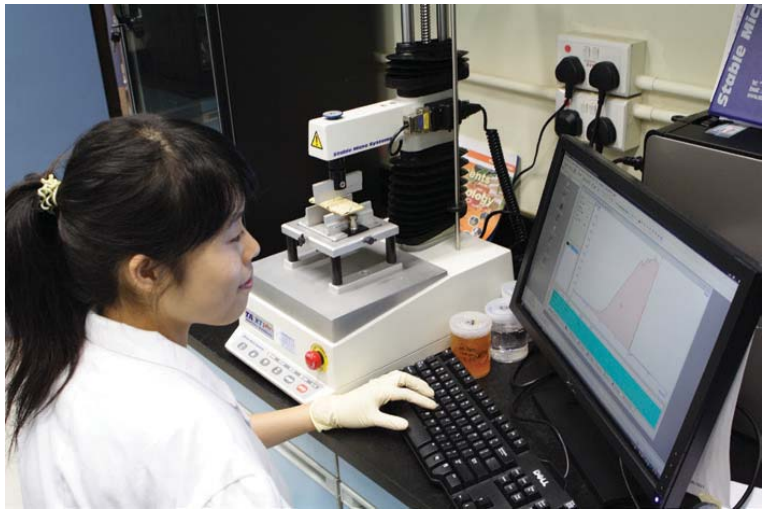
Background

Food safety and healthy eating that improve the quality of life have become an everyday critical awareness. The rapid advance and expansion of food-related industries further pose new challenges and research opportunities in food and nutritional sciences.

In response to the increasing demand of manpower for food science and nutritional studies, the University established the Food and Nutritional Sciences programme in 1994. We are intended for students who are interested in modern food and nutritional sciences, and their diverse applications such as food safety and toxicology, food microbiology, food preservation, food product development, food analysis, quality assurance, nutrient metabolism, introductory dietetics, and community nutrition. The specialized training in the field with wide scope prepares our students for the employment in the industrial and commercial sectors, in government and private health services, and food catering institutes services organizations.

Mission

- To provide training to students on modern food and nutritional sciences, with an emphasis on oriental cultural background and perspectives
- To provide research and development expertise that enhances and sustains the competitiveness of the Hong Kong food industry and health/nutrition professions and business.



Curriculum

Food and Nutritional Sciences (FNSC)

Study Focus:

- Nutrition & Human Development
- Food Chemistry & Analysis
  Nutritional Biochemistry
- General and Food Microbiology
- Fundamentals of Biochemistry & Cell Biology
- Fundamentals in Organic Chemistry, Mathematics, and Physics

Elective Areas:

- Independent research in Food and Nutritional Sciences
- Community Nutrition and Medical Nutritional Therapy
- Food Technology and Processing
  Food Product Development and Quality Control
  Food Safety and Toxicology
  Human and Nutritional Physiology
  Advanced topics offered by other SLS programmes:
- *Biology:* Genetics
- *Biochemistry:* Immunology, Endocrinology
  Environmental Science: Environmental Toxicology
  Molecular Biotechnology: Genetic Engineering
- *Statistics:* Biostatistics

Expected learning outcomes

- Understand the core knowledge and latest issues in food and nutritional sciences that promote the competitiveness of the students in the labor market
- Acquire abilities to access, retrieve and critically evaluate information relevant to food and nutritional sciences
- Apply the knowledge of food and nutritional sciences into real-life practical situations

Views of current students

The good reputation and interesting study topics brought me to the CUHK Food and Nutritional Sciences. The contents of the major courses are good. The knowledge related to food science and nutrition well prepares me for future career development. One excellence about the curricular design is the chances to study different topics in life sciences before selecting the major.

Kwok Wing-Hang

Food and Nutritional Sciences programme has an excellent team of teachers who are enthusiastic about teaching. They are very kind to offer helping hands. The well being of the students is always prioritized.

Yu Chi-On

Contact

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Background

Molecular biotechnology is a revolutionary area of scientific discipline that involves the application of gene and protein technology. This state-of-the-art technology has exerted remarkable contributions to agricultural health, environmental, bioenergy, and other bio- industrial areas. Molecular biotechnology is one of the major driving forces shaping the development of human society in the 21st century.

In view of the current needs of increasing manpower and future prospects of biotechnology, the University launched the Molecular Biotechnology programme in 1998. We target students who are interested in genetic engineering, molecular biology, methods in biochemistry, microbial, plant, and animal biotechnology. Other in-depth knowledge from an array of elective courses covering various aspects of cell & developmental biology, animal and plant physiology, immunology and clinical biochemistry, bioinformatic, genomics and proteomics are also provided for students' selection. In addition, we also address the business and social implications of biotechnology, such as government policy, management, intellectual property, and ethical and public concerns.

Mission

- To provide theoretical and hands-on training to students on the fundamental knowledge, current development, business and social implications of molecular biotechnology
- To cultivate the ability of logical and critical thinking, and scientific communications

MBT 10th Anniversary Banquet

The 10th Anniversary Symposium of the Molecular Biotechnology programme

Curriculum

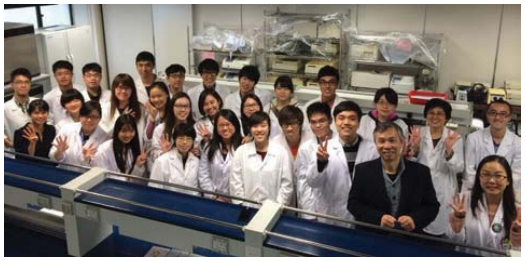
Moleular Biotechnology (MBTE)

Study Focus:

- Molecular Biotechnology in Animals, Plants and Microorganisms
- Business & Social Aspects of Biotechnology
- Methods in Molecular Biotechnology
- Methods in Biochemistry
- Genetics & Genetic Engineering
- Cell Biology & Diversity of Life
- Microbiology
- Fundamentals in Organic Chemistry, Mathematics, and Physics

Elective Areas:

- Independent research in Molecular Biotechnology
- Advanced topics offered by other SLS programmes:
  Biochemistry: Protein and Enzymes, Bioenergetics and Metabolism, Immunology, Clinical Biochemistry
  Biology: Physiology, Developmental Biology
  Cell & Molecular Biology: Stem Cell Biology, Cell Biology of Cancer and Neuronal System
- *Statistics:* Biostatistics
  Biomedical Engineering offered by the Faculty of Engineering



Curriculum Highlights

- Fundamental knowledge in life science with emphasis on molecular biotechnology
- Hands-on skills through specially designed laboratory courses on methods in molecular biotechnology
- In-depth knowledge in selected areas of your choice. Topics cover various aspects of challenge's fields in biology & biochemistry
- Comprehensive understanding of the business and social implications of biotechnology, such as government policy, management, intellectual property, and ethical and public concerns

Visit biotechnology companies

Career talk given by alumni

Expected learning outcomes

- Gain solid knowledge in life science, with particular emphasis on the principles and potential applications of molecular biotechnology includes genetic engineering, molecular biology, methods in biochemistry, microbial biotechnology, plant biotechnology and animal biotechnology
- Acquire hands-on operational capability in basic skills of molecular biotechnology
- Understand the business and social implications of biotechnology, such as government policy, management, intellectual property, and ethical and public concerns
- Be able to judge the pros and cons of various applications of molecular biotechnology on human society and natural environment
- Acquire hands-on operational capability in basic skills of molecular biotechnology
- Develop competitive quality for future careers in scientific research and development

View of current students

I enrolled to the University via the Early Admission Scheme. After the first year of study in life sciences, I found that we had a good chance to know the study topics and format before really choosing the preferred major. I have decided to choose Molecular Biotechnology for my major, and it is because its curriculum strikes an excellent balance between basic science knowledge and technical skills. In addition, the ample research chances and good reputation are other factors that bring me to this programme.

Woo Theodosia

Graduation

Contact

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Programme Director:
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Minimum Admission Requirements

JUPAS Admission

- Students who have taken HKDSE and intend to major in one of the six programmes offered by the School of Life Sciences, i.e. Biochemistry, Biology, Cell and Molecular Biology, Environmental Science, Food and Nutritional Sciences, and Molecular Biotechnology, should apply the SCIENCE broad-based admission scheme (JUPAS Code: JS 4601, Science).

The minimum eligibility to apply is 4 core and 2 elective subjects (4C + 2X OR 4C + M1/M2 + 1X), with the minimum requirements for the 4 core subjects of Chinese Language, English Language, Mathematics, and Liberal Studies at levels 3322 respectively.

JUPAS Catalogue No. / Programme	Elective Requirements (X)		Remarks
	Subject	Level	
JS4601 - SCIENCE	Any **ONE** subject from the following: - Biology - Chemistry - Physics - Combined Science - Integrated Science - Mathematics (Module 1 or 2)	Level 3	Bonus points would be offered to the 3rd elective subject in Category A.
	Any **ONE** subject in Category A#	Level 3	

Preferred subjects: Biology, Chemistry, Physics, Combined Science, Economics, Geography, Information and Communication Technology, Integrated Science, Mathematics (Module 1 or 2), and Technology and Living (Food Science & Technology)

Non-JUPAS Admission

- Acquire the International Baccalaureate Diploma; OR
- Obtain good grades in Hong Kong Advanced Level (HKAL) Examination or GCE Advanced Level Examination with no less than three Advanced Level subjects; OR
- Possess a qualification which qualifies for university admission in the issuing country (e.g. SAT in USA, UEC/STPM in Malaysia, ATAR in Australia, OSSD in Canada); OR
- Completed an associate degree or higher diploma

More details can be found in the webpage of Office of Admissions and Financial Aid.

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SCHOOL OF LIFE SCIENCES | 生命科學學院

Cover photo (琴葉紫菀) is kindly provided (taken) by Dr. David Lau of CUHK.