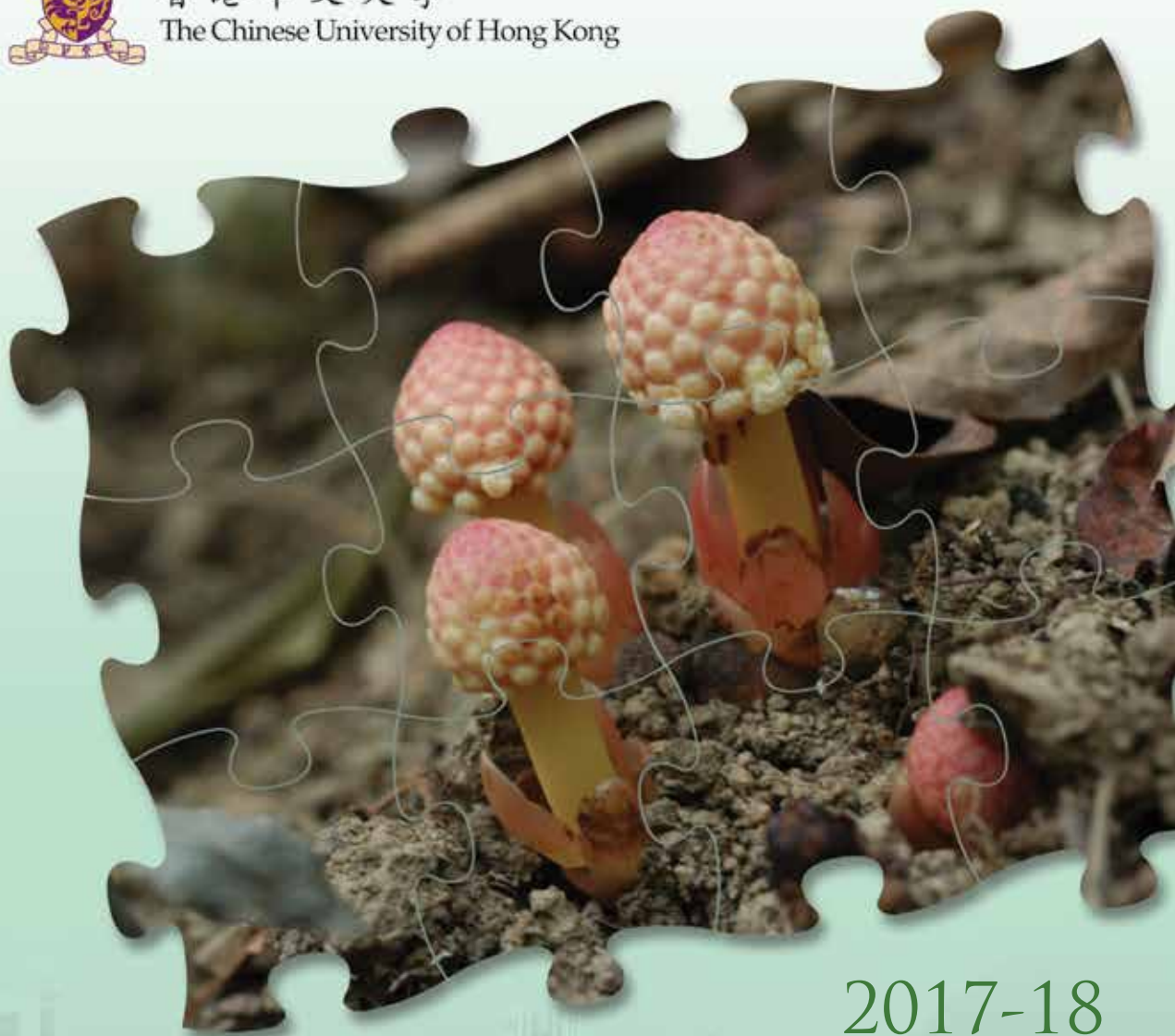




香港中文大學
The Chinese University of Hong Kong



2017-18

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



香港中文大學理學院
FACULTY OF SCIENCE
THE CHINESE UNIVERSITY OF HONG KONG

TABLE OF CONTENTS

Message from the Director	•————• 01
Establishment of the School of Life Sciences	•————• 02
Why SLS at CUHK?	•————• 03
High Diversity in Life Sciences	•————• 04
Course List for 4-year Cohort (2016-17)	
Study Scheme	
Examples of course patterns for the Exploration phase	
World Class Education	•————• 11
Excellent Research	•————• 18
Breaking News	
Academic Honorees and Awardees	
Research in the School	
Research Institutes and Centers	
Shiu-Ying Hu Herbarium	•————• 32
Shiu-Ying Hu Herbarium	
Ample Opportunities	•————• 35
Good Internationalization	•————• 38
Outstanding Career Prospects	•————• 39
Individual Programmes	•————• 44
Biochemistry	
Biology	
Cell & Molecular Biology	
Environmental Science	
Food & Nutritional Sciences	
Molecular Biotechnology	
Minimum Admission Requirements	•————• 63
Contact	•————• 64

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 8600 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, three research projects “Plant and Agricultural Biotechnology”, “Centre for Organelle Biogenesis and Function” and “Center for Genomic Studies on Plant-Environment Interaction for Sustainable Agriculture and Food Security” 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 (2017-18)

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
BCHE4070	Management and Accreditation of Biochemical Laboratory	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

Environmental 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)
FNESC2001	Introduction to Food Sci & Technology	2
FNESC2002	Nutrition for Health	2
FNESC3001	Food Sci Lab I	2
FNESC3002	Nutritional Sci Lab I	2
FNESC3010	Nutrition and Human Development	3
FNESC3030	Nutritional Biochemistry	3
FNESC3110	Food Chemistry and Analysis	3
FNESC3180	Food Microbiology	3
FNESC4001	Food Sci Lab II	2
FNESC4002	Nutritional Sci Lab II	2
FNESC4101	Human Physiology for Nutrition Studies I	3
FNESC4102	Human Physiology for Nutrition Studies II	3
FNESC4110	Food Technology	3
FNESC4120	Community Nutrition	3
FNESC4150	Introduction to Medical Nutrition Therapy	3
FNESC4160	Nutrition Planning and Food Policy	3
FNESC4170	Food Product Development and Quality Control	3
FNESC4901	Senior Experimental Project I	2
FNESC4902	Senior Experimental Project II	2
FNESC4903	Senior Experimental Project III	2
FNESC4906	Internship	2
FNESC5430	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 will 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	Build up fundamental knowledge <i>with Faculty Package in Terms 1 and 2</i> LSCI1002* + CHEM1280 or CHEM1070 + one course from Maths, Physics, Statistics.
Term 2	
Term 3	
Term 4	Confirm your interest <i>Select preferred courses from a list of 15 offered by all 6 programmes</i> BCHE2000 BCHE3050 BCHE3070 BCHE3650 BIOL2210 BIOL2213 BIOL2313 BIOL2410 CMBI2200 ENSC2270 FNESC2001, 2002 FNESC3180 MBTE2000 MBTE2010
Term 5	Foster to be a specialist <i>Engage in the advanced and specialized study posed by your Major program</i>
Term 6	
Term 7	
Term 8	

* 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 15 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	FNESC	MBTE
BCHE2000	2	✓					
BCHE3050	2	✓		✓			
BCHE3070	1	✓		✓			
BCHE3650	2	✓					
BIOL2210	3		✓		✓		
BIOL2213	1		✓		✓		
BIOL2313	1	✓	✓	✓			✓
BIOL2410	2	✓	✓	✓		✓	✓
CMBI2200	2			✓			
ENSC2270	3				✓		
FNESC2001	2					✓	
FNESC2002	2					✓	
FNESC3180	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 nitrofurantoin 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		Example 2: Jackson		Example 3: Jenny	
Course	Unit	Course	Unit	Course	Unit
BIOL2410	2	BIOL2210	3	BCHE2000	2
FNSC2002	2	BIOL2213	1	BIOL2410	2
FNSC3180	3	BIOL2410	2	BIOL2313	1
1 major elective	3	ENSC2270	3	CMBI2200	2
<i>Total: 10</i>		<i>Total: 9</i>		<i>Total: 9</i>	

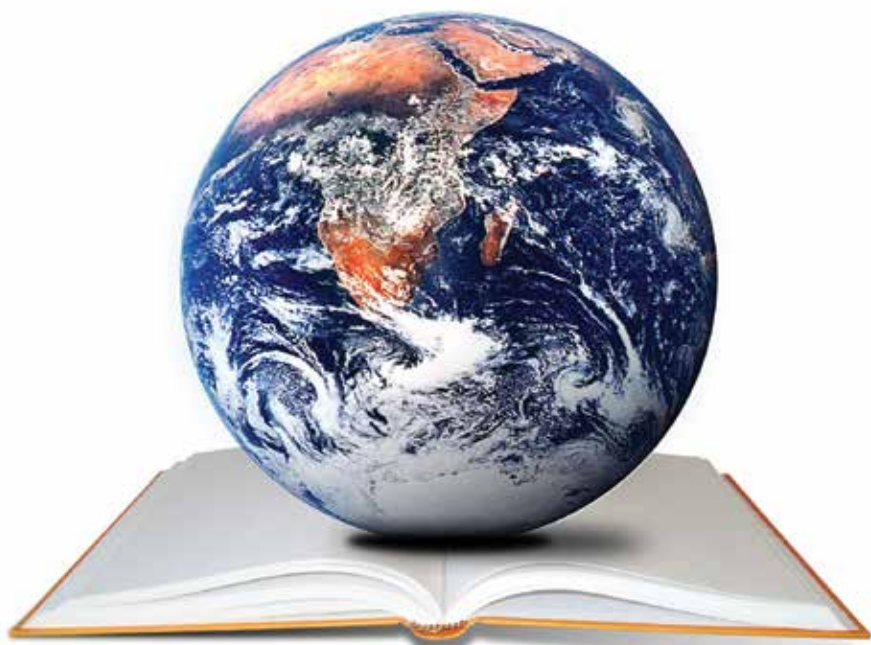
After the second phase of study, students should finalize their decisions on major selection according to their interests. There are 3 occasions on which students can declare their major: after admission, by the end of the first year and by the end of the second year of study. Depending on the pre-defined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

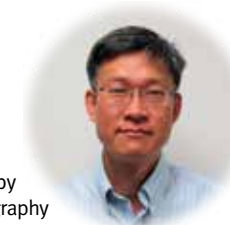
TEACHERS IN THE SCHOOL OF LIFE SCIENCES

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)
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



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



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

Research Interests:

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



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



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



Kong Siu-Kai, PhD (CUHK)
Director, M.Sc. Programme in
Biochemical and Biomedical Sciences
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



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



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

Research Interests:

1. Industrial, restoration and urban ecology
2. Pollution studies



Chu Ka-Hou, PhD (MIT/WHOI)
Director, Biology Programme
Email: kahouchu@cuhk.edu.hk

Research Interests:

1. Molecular marine biology and biotechnology
2. Biology of crustaceans



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



Associate Professors

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

Research Interests:

1. Protein post-translational modification
2. Macromolecular assembly



Chung Hau-Yin, PhD (Louisiana State)
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



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

Research Interests:

1. Structure and function of anti-quinin
2. Anti-tumor effects of novel photosensitizers in photodynamic therapy
3. Role of miR-200 in ovarian cancer development



Lee Shing-Yip, Joe, PhD (HKU)
Director, Simon F.S. Li Marine Science
Laboratory
Email: joesylee@cuhk.edu.hk

Research Interests:

1. Ecology and biogeochemistry of estuarine
2. Application of stable isotopes in marine environmental research
3. Marine ecosystem dynamics, rehabilitation and Restoration



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



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 tumorigenesis
3. Mammalian neural development
4. Stem cell research

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

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

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

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



Research Interests:

1. Molecular neuroscience
2. Molecular pathogenesis of neurodegeneration

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

Wong Wing-Tak, Jack, PhD (CUHK)
Email: jack_wong@cuhk.edu.hk



Research Interests:

1. Vascular and metabolic biology
2. Stem cell biology
3. Cardiovascular regeneration

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

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

Zhong Silin Steven, PhD (Nottingham)
Email: silin.zhong@cuhk.edu.hk



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

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

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

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

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

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)
Email: chimingchiu@cuhk.edu.hk

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



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)
Email: nina@cuhk.edu.hk

Research Interests:

1. Molecular and cellular neuroscience
2. Cell signaling and gene regulation



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



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



Chui Pui Yi, Apple, PhD (CUHK)
Email: appleychui@cuhk.edu.hk

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: peggyyipuisze@cuhk.edu.hk

Research Interests:

1. Nutrition promotion
2. Public health and community nutrition



Lo Fai-Hang, PhD (CUHK)
Email: lofaihang@cuhk.edu.hk

Research Interests:

1. Molecular cell biology
2. Cancer research
3. Natural product research
4. Life science research and education methodologies



Assistant Lecturer

Chu Kin-Kan Astley, MPhil (CUHK)
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



Ngai Hung-Kui, PhD (CUHK)
Email: hkngai@cuhk.edu.hk

Research Interests:

1. Protein biochemistry
2. Science education



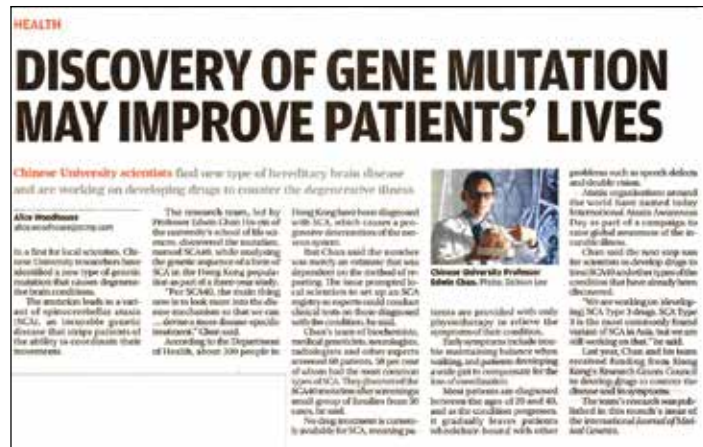
EXCELLENT RESEARCH



HOPE FOR PATIENTS WITH SPINOCEREBELLAR ATAXIA

Cerebellum is a region of the brain concerned primarily with the maintenance of posture and balance and the coordination of movement. Disease or damage to it can result in abnormalities of motor control. The culprit is exceptionally elusive if it runs in the family of the sufferer. That is why Spinocerebellar Ataxia, or SCAs, the group of rare genetic diseases that causes progressive deterioration of the nervous system, particularly the cerebellum, is at present considered incurable. SCA patients gradually lose the fine motor functions of their bodies. Although their minds are fully clear and active, they often have blurred speech and vision.

Our research team has unveiled that, among the 40 odd subtypes of Spinocerebellar Ataxia (SCAs), one group known as polyglutamine (polyQ) is the result of cell death in the neurons of the brain that disrupts the function of the cerebellum. Having identified the pathogenic process termed nucleolar stress, we managed to identify a peptide out of a family of six to act as a decoy for the toxic RNA to prey on, thus relieving the nucleolin to function normally. Collaborating with scientists in different countries, we developed a novel drug called P3 peptide inhibitor that could pass through the blood-brain barrier. This peptide inhibitor drug is a promise of help for patients suffering from polyQ and a number of fatal, inherited neurodegenerative diseases such as Huntington's disease. It also carries the potential to be developed to treat others not so rare neurodegenerative diseases. Most importantly, peptide drugs are desirable for treating brain diseases because of its low toxicity. Well known for its specificity and can reach target cells precisely, they are also very potent so that the amount to be administered could be concise. So far P3 has already come to its 31st version, after the concerted efforts in Denmark and France.



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.

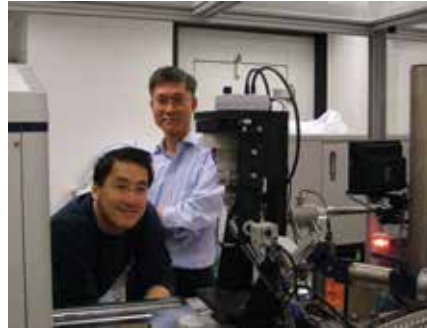
With these efficient quality assurance controls, mislabeling and fraudulent substitution in the local markets can be controlled. The project will contribute to food safety and enhance the reputation of the local food market.



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.

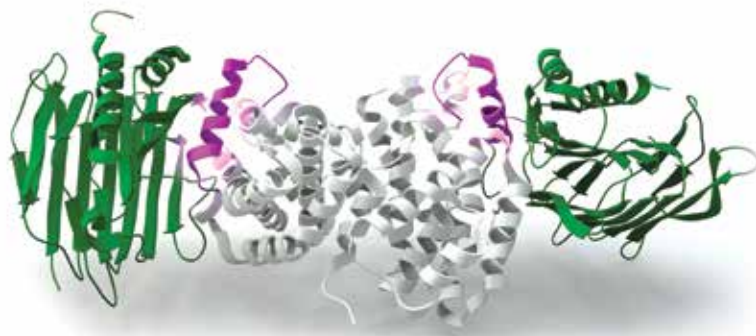
NEW WAY TO BATTLE STOMACH ULCERS AND CANCER

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 disassemble 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

Global Agriculture is facing growing challenges including limitation in freshwater resources, topsoil depletion, as well as extreme temperatures brought upon by climate change. Sustainable agriculture is now among the top national priorities of developing countries, to bolster food security, economy, and environmental sustainability.

Among all crops, soybean 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. Despite all its benefits, soybean’s great potential in promoting sustainable agriculture is still undervalued and awaiting to be unveiled.

Prof. Lam Hon-Ming, Director of the Partner State Key Laboratory of Agrobiotechnology, The Chinese University of Hong Kong (PSKLA), has been working on the identification of stress tolerance genes in soybean for almost 20 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 published in Nature Communications, a multi-disciplinary scientific journal ranked just after Nature and Science. This is a milestone in the mass production of high quality salt tolerant soybeans, a stage reached which will eventually benefit agriculture worldwide.

Prof. Lam has also been 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. In 2016, two new stress tolerant soybean cultivars gained provincial approval in China, and were cultivated in arid regions to restore arable land and help the local farmers. In the same year, he jointly published a perspective article to Nature Plants, together with other members of the World University Network (WUN).



Using the WUN platform, Prof. Lam organized an international legume symposium in 2017, hosting more than a hundred legume scientists from the six Continents, establishing extensive collaboration networks for academic exchange and collaboration projects.

In 2017, Prof. Lam leading a team of plant and agricultural researchers, has been awarded funding in excess of HKD81 million over 8 years from the Area of Excellence (AoE) Scheme under the Research Grants Council (RGC), with their vision to develop new plant and agricultural technology to strike for a better balance between food security and agricultural sustainability.



MAJOR PROGRESS MADE IN PLANT AUTOPHAGY RESEARCH BY CUHK RESEARCHERS PUBLISHED IN PNAS

A team of researchers at The Chinese University of Hong Kong (CUHK) led by Professor JIANG Liwen, Choh-Ming Li Professor of Life Sciences, has recently made a major breakthrough in revealing the membrane origin of autophagosome in plants, providing new insight into improving crop quality. The results have been published in Proceedings of the National Academy of Sciences (PNAS).



*A research team led by Prof. Liwen Jiang of School of Life Sciences sheds new light on the essential role of ATG9 in plant autophagosome membrane initiation.
From Left: Prof. Byung-Ho KANG; Mr. Kin Pan CHUNG; Dr. Xiaohong ZHUANG; Prof. Liwen JIANG and Dr. Yong CUI.*

Autophagy is a conserved degradation process in eukaryotic cells to eliminate intracellular components during stress conditions and pathogen infection. Professor Jiang’s research team has been working on the underlying mechanisms of protein transport and organelle biogenesis in plant cells for more than 16 years at CUHK, and has been internationally recognized as a leading group in the field of plant cell biology. In the recent study published as a PNAS Plus paper, his research team utilized a combination of in vivo real-time imaging, 3D tomographic reconstruction, and genetic approaches, uncovered a unique role of ATG9 in mediating autophagosome progression from the endoplasmic reticulum (ER). His research team has addressed a fundamental question on “where is the membrane origin of the autophagosome” which puzzling scientists in the past decades.

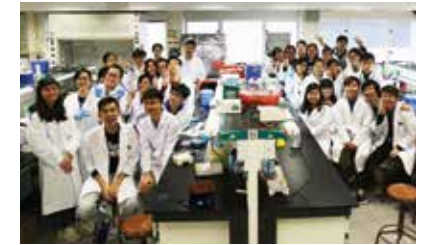
Professor Jiang said, ‘This discovery has far reaching implications for enhancing agricultural productivity. Since ATG9 is conserved among higher eukaryotic cells, such as rice, maize and soybean, further research on the molecular mechanism of plant autophagy pathway will provide new insight into how to improve crop quality to overcome stress environment or pathogen infection, which has become a serious problem in agriculture.’

This study was mainly carried out by two postdoctoral fellows (Drs. ZHUANG Xiaohong and CUI Yong) and a Ph.D. student (Mr. CHUNG Kin Pan) in Professor Jiang’s laboratory, in collaboration with Prof. Byung-ho KANG, an expert in 3D Tomography TEM analysis. The project was supported by the Areas of Excellence (AoE) Scheme and Collaborative Research Fund (CRF) of the Hong Kong Research Grants Council, as well as the AoE Centre for Organelle Biogenesis and Function, Centre for Cell and Developmental Biology, and State Key Laboratory of Agrobiotechnology (Partner Laboratory in The Chinese University of Hong Kong) of CUHK.

Graduate students and postdoctoral researchers supervised by Professor Jiang’s have received many prestigious awards for their research excellence, including CUHK Young Scholars Dissertation Award (twice), Postgraduate Research Output Award (five times), Keystone Symposium Scholarship USA (twice) and Human Frontier Science Program Long-Term Fellows (twice), as well as the Thousand Talent Plan of China (twice).

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.



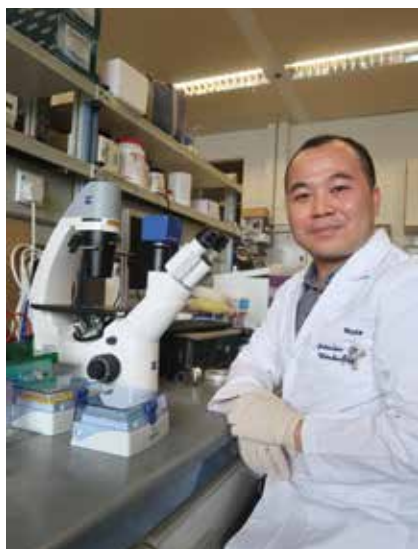
Our iGEM teams consist mainly but not limited to students from the Faculty of Science and Engineering. We work together using synthetic biology experiments to develop their “bio-bricks”, the standardized DNA parts tailor-made for different specific tasks, and characterize them systemically and scientifically, 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 vinelandii 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

A NEW THEORY FOR BACTERIAL GENOME EVOLUTION IN THE OCEAN

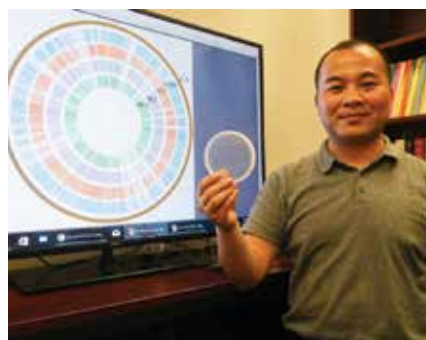


A drop of seawater contains millions of bacteria, most of which are only about 0.5 microns in cell size and about 1.5 mega nucleobases in genome size. A few prominent examples include the photoautotrophs *Prochlorococcus*, which makes 20% of the chlorophyll synthesized by marine and land plants on the Earth, and the most abundant organoheterotrophs SAR11 and SAR86. Over the past decade, it has been believed that the evolutionary pattern of these tiny marine bacteria is well explained by Darwin's theory of biological evolution, which states that organisms adapt to the environment by preserving or eliminating genetic traits through natural selection. Seawater is an extremely dilute matrix where nutrients are scarce and often limit the growth of plankton. Through long-term evolution, many successful planktonic bacteria including *Prochlorococcus*, SAR11 and SAR86 lost a large number of DNA molecules. This phenomenon has been interpreted as the major way that marine bacteria take to

adapt to the oligotrophic seawater, because having less DNA can save energy and material in biosynthesis and also reduce the cell volume, thereby increasing the surface-to-volume ratio allowing more efficient uptake of nutrients from seawater. Thus, scientists have generally believed that evolution toward small genomes in marine bacterioplankton is the result of Darwinian natural selection.

A recent study by Prof. Haiwei Luo and his international team has provided convincing evidence against this theory. By reconstructing the evolutionary history and calculating the evolutionary rate of different types of gene mutations in nearly 100 genomes of *Prochlorococcus*, the researchers identified an excess of the more deleterious type of gene mutations accumulated at genome-wide scale during the early evolution of *Prochlorococcus*, which coincided with the large-scale loss of DNA molecules. According to the modern molecular evolution theory, this finding supports that *Prochlorococcus* lost a large number of DNA molecules not for the purpose of adaptation to the nutrient-deficient seawater. On the contrary, it was a random process driven by genetic drift. This mechanism was also shown to drive the massive DNA losses during the early evolution of some marine organoheterotrophs such as SAR86.

An important implication from this study is that during the early evolution of these tiny bacteria, the ocean changed to a hostile condition in which these bacteria ceased to grow. This led to the failure of the natural selection mechanism and the concomitant accumulation of harmful genetic mutations. This study involved multi-disciplinary knowledge including microbiology, evolutionary biology, marine science and computer science, and was published in *Nature Microbiology* in July 2017.



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 thrice (2006-07, 2009-10 & 2015-16), 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 (five 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\$90 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.

Professor Hon-Ming Lam has just received an AoE grant of HK\$75.591M for “Center for Genomic Studies on Plant-Environment Interaction for Sustainable Agriculture and Food Security.”

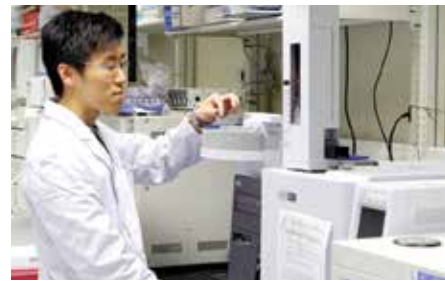
CRF Project:

Professor Liwen Jiang was awarded HK\$7.36M for “EXPO (Exocyst-positive Organelle): Dynamics, Biogenesis and Functions in Plants” and HK\$8.36M for “EXPO and Autophagosome in Plants” for the past 2 years. He has just been awarded HK\$9.5M for “The First Integrated cryo-EM and cryo-ET Shared Facility for Life Sciences Research in Hong Kong”.

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 Peptidyl Inhibitors”.

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



Other Research Awards

Research Excellence Award

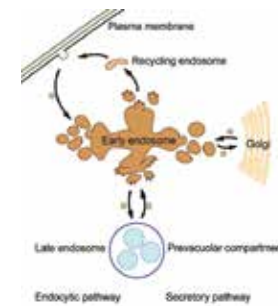
Year	Awardees
2006-2007	Professor Jiang Liwen
2007-2008	Professor Chu Ka-Hou
2008-2009	Professor Chen Zhen-Yu
2009-2010	Professor Jiang Liwen
2012-2013	Professor Lam Hon-Ming
2015-2016	Professor Jiang Liwen

CUHK Young Researcher Award

Year	Awardees
2008-2009	Professor Kwan Kin-Ming
2009-2010	Professor Chan Ho-Yin Edwin
2016-2017	Professor Luo Haiwei

RESEARCH IN THE SCHOOL

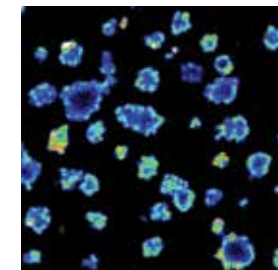
The School of Life Sciences engages actively in a wide array of research areas. They vary from as small as a molecule to as large as a habitat.



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 secretory 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 fibres, and non-nutritive compounds isolated from plant foods are investigated for their potential benefits in the prevention of chronic disease development.

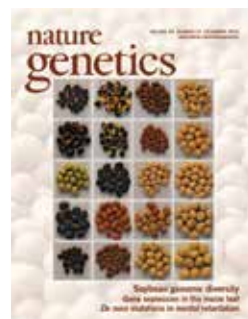
The palatability of food depends on our sensual perception. Key food chemical ingredients interacting with our sensory receptor are investigated.

To tackle diseases that have not yet been cured by modern medicine, several members in the School are working in 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 strain 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

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.

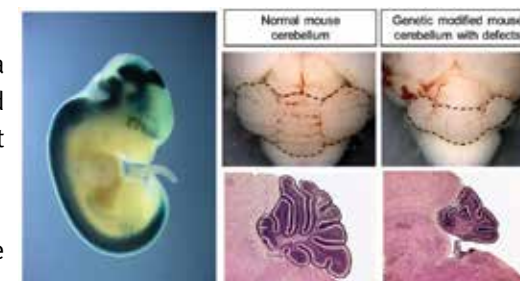


The SKL team and the researchers from the member laboratories at the SKL 2014 Annual Meeting. The current director and deputy director are Prof. Jianhua Zhang and Prof. Hon-Ming Lam (front row, 7th and 9th from left, respectively).

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.

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



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



SHIU-YING HU HERBARIUM



SHIU-YING HU HERBARIUM, SCHOOL OF LIFE SCIENCE, CUHK



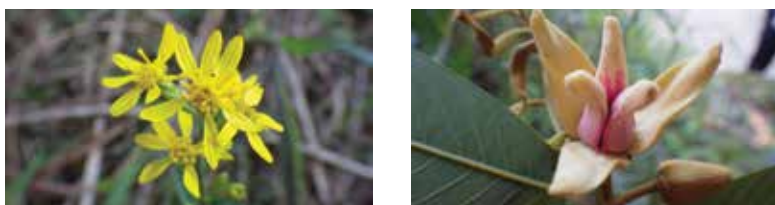
History

The Herbarium of CUHK was formerly a research facility in the Department of Biology since 1968. It was renamed as the Shiu-Ying Hu Herbarium in 2013 for the extension of the legacy of the late Prof. Hu's contribution in plant taxonomy. The Herbarium collection contains more than 40,000 plant specimens, mostly collected and authenticated by Prof. Hu, and an archive of botanical references and information.



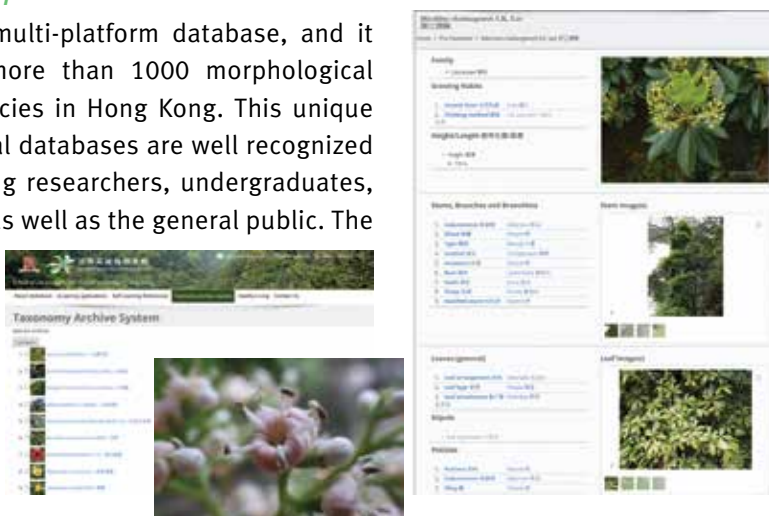
Research platform

The Herbarium is dedicated to documenting plant biodiversity in Hong Kong and the most up-to-date research information. A new research platform of our herbarium was established in 2014 to document plant specimens, multiple botanical images, GPS locations, DNA tissues and Taxonomic Archive database for comprehensive records of local flora.



Taxonomic Archive System

Taxonomic Archive System is a multi-platform database, and it was tailor-made for recording more than 1000 morphological characteristics of every plant species in Hong Kong. This unique archive and its derived educational databases are well recognized by a wide range of users including researchers, undergraduates, primary and secondary students, as well as the general public. The user interface is user-friendly and interactive, and rapid links to glossary definition, species comparison, flipped learning and informative factsheets are always ready for use.



Training and education

Another important mission of the Herbarium is to nurture trainee botanists. Herbarium archive and expertise can enhance the teaching of Hong Kong Flora and Vegetation, which is a unique course offered by the School of Life Sciences, CUHK. It further facilitates the career development of our undergraduate students who are interested in conservation, environmental education, arboriculture or herbal medicines.



Public education activities

In addition, various educational activities such as seminars, herbarium visits, campus walks, overseas excursions and volunteer programs would be organized regularly for the quality enhancement of general education and community services.



Mission and new perspectives

We will continue to dedicate our best efforts in taxonomic research and applications, and explore every opportunity to transfer knowledge and experience in professional training courses, general education and community services. We cherish and thank you for your continued support, participation and collaboration with our Shiu-Ying Hu Herbarium.



CONTACT

Website: <http://syherbarium.sls.cuhk.edu.hk/>
Email: syherbarium.sls@cuhk.edu.hk
Tel: 852-3943-6113 / 852-3943-6141
FAX: 852-2603-7246

AMPLE OPPORTUNITIES



INTERNSHIP, SCHOLARSHIP AND OTHER OPPORTUNITIES

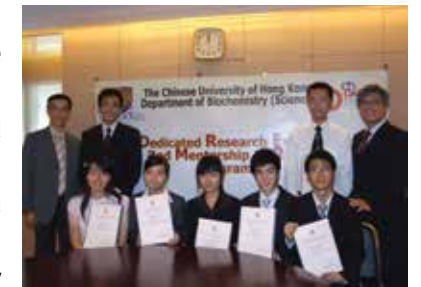
BBSA

The Berkeley Biosciences Study Abroad (BBSA) Programme was introduced in 2016 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.



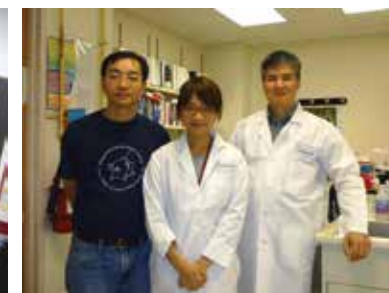
DREAM

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)



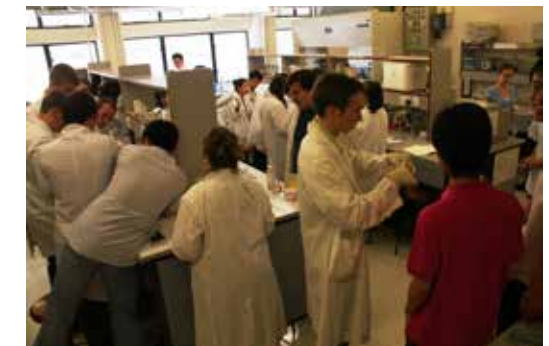
GOOD INTERNATIONALIZATION

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 279 students in 2016/17.



“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)





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

University Dean of Students, CUHK

Associate Vice-President, CUHK

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
Associate Professor
Macau Institute for Applied Research in Medicine and Health
Macau University of Science and Technology

I am very glad to study MBT in my bachelor. The knowledge and experience I gained from MBT indeed lead to some of the most amazing and life-changing opportunities including doing a DPhil at Oxford and working as a scientist in Denmark. The trainings offered by MBT are at the world-class standard. Connection is another key characteristic of MBT. It is precious for MBT graduates to be so close to each other. And for those who are joining our family, there are unlimited possibilities in your future careers. Not only restricted to biotechnology, but there are also various chances such as medicine, publication industry, legal practice and business consultancy. Welcome to MBT!

2004 Graduate (MBT)- Chu Wai Kit
Assistant Professor, Department of Ophthalmology & Visual Sciences, CUHK

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 Alumna (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 Alumna (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



CURRICULUM

Biochemistry (BCHE)	
<p>Study Focus:</p> <ul style="list-style-type: none"> ■ Bioenergetics and Metabolism ■ Biomedical and Health Sciences ■ Genetics and Cell Biology ■ Independent Research ■ Methods in Biochemistry and Molecular Biology ■ Protein and Enzymes 	<p>Elective Areas:</p> <ul style="list-style-type: none"> ■ Clinical Biochemistry ■ Endocrinology ■ Forensic Sciences ■ Immunology ■ Independent research in Biochemistry ■ Laboratory Management and Accreditation ■ Neuroscience ■ Sport Sciences ■ Advanced topics offered by SLS programmes: <ul style="list-style-type: none"> <i>Biology:</i> Microbiology, Animal Physiology, Human Genetics <i>Cell & Molecular Biology:</i> Protein Trafficking and Folding, Stem Cell Biology, Cell Biology of Cancer and Neuronal System <i>Environmental Science:</i> Biochemical Toxicology, Environmental Health <i>Food & Nutritional Sciences:</i> Medical Nutrition Therapy, Nutrition and Human Development <i>Molecular Biotechnology:</i> Animal Biotechnology ■ <i>Statistics:</i> 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 and have the opportunity to specialize in a selected area of biochemistry.
- Gain the knowledge of the latest biochemical technology in proteins, cell biology and, molecular biology.
- 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 including the capability to work in a team.
- Think critically and analytically.
- Commit to ethical professionalism.



VIEWS OF CURRENT STUDENTS



Choosing biochemistry as my major has been one of the best decisions I have ever made. Supported by an excellent and experienced teaching team, we are inspired to look for the hidden mysteries of life. The programme does not only provide us with the opportunity to learn in different research laboratories, but also supports overseas exchange programmes and research opportunities. As one of the committee members of the biochemistry student society, I have organized and participated in numerous activities of the programme. I really enjoy the warm atmosphere of this big family.

Tong Phoebe

My surviving motto is: “Learn Actively and Explore Who You Are!”. Biochemistry curriculum offers a versatile platform to help taste the biological world, from abstract ideas in lectures to practical skills in laboratories. Biochemistry programme also provides seminars, visiting tours, internship and exchange opportunities. With the full support and large flexibility, together with your curiosity and courage, it is an ideal ladder to get involved in the world of emerging science.

Lam Mastech

CONTACT

Website: www.cuhk.edu.hk/lifesciences/bche
 Email: biochemistry@cuhk.edu.hk
 Tel: 852-3943-6359

Programme Director:
 Professor Shaw Pang-Chui
pcshaw@cuhk.edu.hk



Biochemistry 40th Anniversary High Table Dinner

BACKGROUND

Biology is a broad scientific discipline embracing many different fields of study, including the functioning 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 services. 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 courses 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 advancements in biology
- To promote excellence in teaching and research in all levels of biological sciences from molecular biology to ecology



Stanley Main Beach, HK



Taipo River, HK



Tolo Channel, HK



Sungei Buloh Wetland Reserve, Singapore

Biology students investigate natural environments through local and overseas field trips.

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

In my life of studying in CUHK, my favorite Biology courses are the Biodiversity Lab and the Hong Kong Flora and Vegetation. I love these courses because, rather than just having the lecture, they offered us a fresh and interesting way to learn - observing live specimens, dissecting animals and flowers, and investigating plants during field trips by using sight, smell, touch and even taste! They really enriched my knowledge about plants and animals.



WONG Ka Yi

Biology programme helps me to build a solid foundation on biological knowledge. There are interesting laboratory sessions to discover biodiversity, eye-opening field study abroad to broaden my horizon and projects for students to work out like real researchers.



Biology programme is more than a programme for learning; Biology students have strong bonding like one big family. The Biology Society organizes many activities throughout the year to entertain. Even the alumni are very helpful that they are very willing to give advice on academics and career path even graduated for many years.

JONG Tak Chu

CONTACT



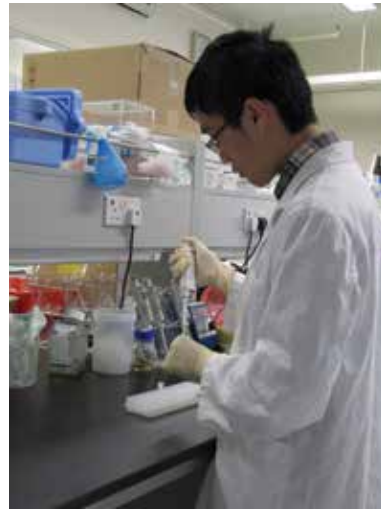
Website: www.cuhk.edu.hk/lifesciences/biol
 Email: bio@cuhk.edu.hk
 Tel: 852-3943-6249

Programme Director:
 Professor Chu Ka Hou
kahouchu@cuhk.edu.hk

BACKGROUND

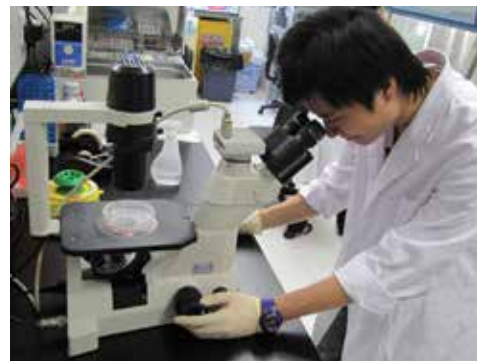
Cell and Molecular Biology (CMB) is an interdisciplinary field that represents the frontiers of biology and medicine. Advances in multi-omics sequencing approaches and microscopic imaging techniques have signaled a shift of focus in modern biology towards understanding the functions of genes at the molecular, cellular and organismic levels.

It is in this background that the University proudly launched the Cell and Molecular Biology programme in 2008. As the first programme in the region to focus on the study of molecular and cellular biology, we offer an integrated curriculum that provides students a solid knowledge base in areas such as stem cell biology, cancer cell biology, protein trafficking, genomics and more. CMB students receive intensive laboratory training and gain practical skills in scientific writing and presentation, all with the goal of preparing students for undertaking future research-related work in CMB and beyond.



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
- An integrated programme of study covering cutting-edge research topics in cell and molecular biology on top of the solid knowledge in life sciences
- Communication and logical reasoning skills essential for a successful career



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

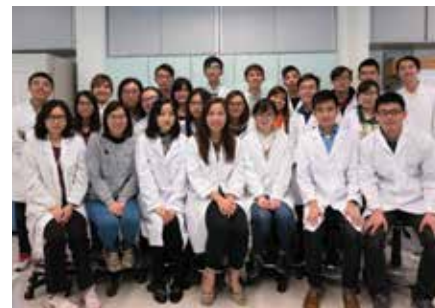
VIEWS OF CURRENT STUDENTS

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

The CMB program has offered me a superb learning experience. As a student interested in life science research, not only did I acquire knowledge in a wide range of biological disciplines, I also had the opportunity to join three different laboratories throughout my undergraduate years. These hands-on experiences helped me understand what scientific research is like and enabled me to discover my passion in the field of cell and molecular biology, based on which I made a decision about my career. Studying CMB has brought to me an enriched and meaningful university life.

Gong Yaoyu Maurice



CONTACT

Website: www.cuhk.edu.hk/lifesciences/cmbi
 Email: cmb@cuhk.edu.hk
 Tel: 852-3943-1361

Programme Director:
 Professor Jiang Liwen
ljiang@cuhk.edu.hk

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

Environmental Science (ENSC)

Study Focus:

- Ecology
- Environmental Chemistry & Instrumentations
- Environmental Impact Assessments
- Environmental and Biochemical Toxicology
- Environmental Instrumentation Techniques

Elective Areas:

- Chemical Treatment Processes
- Conservation Biology
- Environmental Biotechnology
- Environmental Protection & Pollution Control
- Environmental Health
- Field Study
- Hong Kong Flora and Fauna
- Internship
- Marine Biology
- 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 and Environmental 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 able to join the HKIQEP, Hong Kong Institute of Qualified Environmental Professionals, as a member after graduation.

VIEWS OF CURRENT STUDENTS

Throughout my 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 took Directed Research Project for strengthening my laboratory skills and independent working ability. Furthermore, it would be a valuable experience to have a preliminary exposure being a scientist, in my Directed Research Project. This programme provides a number of elective courses, field studies, as well as encourage the development of aspiring environmentalists.

Mak Chu Wa

After taking various introductory courses about basic science knowledge in year 1, in my second year of study, I begin to study different courses related to environmental science. The programme allows me to gain knowledge in environmental science through lectures, laboratory courses and field trips. In one of the courses, I have to do individual and group data researches on environmental issues, which enables me to further consolidate the knowledge I learnt and be a better team-player and that is important to my future development.

Lau Ching Yee

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.



CONTACT

Website: www.cuhk.edu.hk/lifesciences/ensc
Email: ens@cuhk.edu.hk
Tel: 852-3943-6294

Programme Director:
Professor Chan King-Ming
kingchan@cuhk.edu.hk

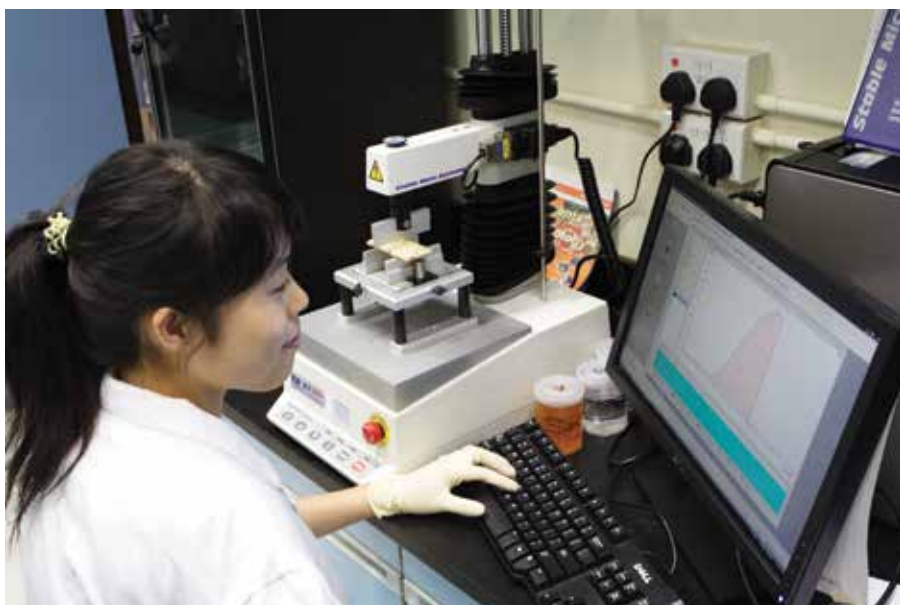
BACKGROUND



Food safety and prudent diet safeguarding the quality of our lives have become increasingly important. The rapid advancement of nutrition knowledge and the expansion of the food industry further pose new challenges as well as research opportunities in food and nutritional sciences. In order to cope with the increasing demand of specialists in these areas, the Chinese University of Hong Kong started the offering Food and Nutritional Sciences Programme since 1994. Food provides the source of nutrients to human. Although food science and nutritional science are two different subjects, they are inseparable. Therefore, students admitted to our programme are expected to know these two areas. After completion, they will gain the knowledge in both food and nutritional sciences; this background would allow them to work in the food industry, as well as the nutrition/health field. In addition, our programme also prepares students to pursue further study on dietetics.

MISSION

- To provide training to students on modern food and nutritional sciences, with an emphasis on the oriental perspective
- To provide research and development expertise that enhances and sustains the competitiveness of the Hong Kong food industry
- To provide support and training to nutrition and its related professions.



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
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 increase 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 situations



VIEWS OF CURRENT STUDENTS

I chose Food and Nutritional Sciences Program as my major because it is more applicable and closely related to our everyday life. It includes the studies of both food and nutrition, which are inseparable but actually two different disciplines. Food science mainly focuses on food itself, including food handling, manufacturing, and safety, while nutrition science investigates the nutrition needs of our body and how our body reacts to the nutrients. After learning those courses, we would be able to understand and explain most of the phenomenon that we usually come across in our daily life, such as the reason why sugar becomes brown in color after heating and why vitamin A is essential to night vision. The broad topics discussed in the program are definitely an inspiring and valuable knowledge base for our future career or postgraduate studies in this field.

CHOOK Chui-Yiu



I am a final year student of Food and Nutritional Sciences. This programme may not be very career-oriented, but I can obtain useful and interesting knowledge for my daily lives.

When hear about this programme, many people may focus only on the 'nutrition' part. I do learn a lot about nutrition with the three-year study of this programme. I can make use of what I have learnt to eat healthier as well as suggesting my family and friends to eat healthier depending on their needs. I can also see the health products critically and judge whether their claims are valid.

Apart from nutrition, I also learn a lot about food. As a food lover, I enjoy knowing some sciences in food, such as the chemical structure of food which gives the unique taste, texture and aroma to the food. In addition, I am currently working as a hygiene coordinator in a hotel, and I can apply my knowledge gained in courses related to food safety and hygiene management.

WONG Wing-Yin Renay

CONTACT



Website: www.cuhk.edu.hk/lifesciences/fnsc
 Email: fns@cuhk.edu.hk
 Tel: 852-3943-6295

Programme Director:
 Professor Leung Lai-Kwok
laikleung@cuhk.edu.hk

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

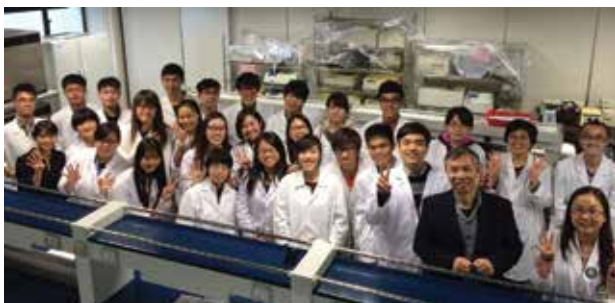
Molecular Biotechnology (MBTE)

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

Since I was introduced to the growing field of biotechnology in eighth grade, it has interested me greatly. The application of biological knowledge to varied aspects of medicine, agricultural, and environmental issues made it an attractive subject of study for me along with the great potential of biotechnology in solving some of the most pressing problems of the world today. This is why I chose the MBT programme. In this light, the programme includes interesting courses that allow us to explore biotechnology through presentations, field trips, analysis reports, and poster-making.

Sukanya Sampath



Graduation

CONTACT

Website: www.cuhk.edu.hk/lifesciences/mbte
 Email: mbt@cuhk.edu.hk
 Tel: 852-3943-6393



Programme Director:
 Professor Lam Hon-Ming
honming@cuhk.edu.hk

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	Selection Principle: Total score of 5 subjects. Bonus points would be assigned to the 6 th and 7 th subjects in Category A and Category C.
	Any ONE subject in Category A	Level 3	

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.

General Office of the School of Life Sciences
Room 132, Science Centre North Block
Tel: 3943-6122
Email: lifesciences@cuhk.edu.hk
Website: www.cuhk.edu.hk/lifesciences/



Copyright © 2017
School of Life Sciences, Faculty of Science,
The Chinese University of Hong Kong.
All Rights Reserved.



SCHOOL OF LIFE SCIENCES | 生命科學學院

Cover photo (紅琴蛇菰 / *Balanophora harlandii* Hook. f.)
is kindly provided (taken) by Dr. David Lau of CUHK.