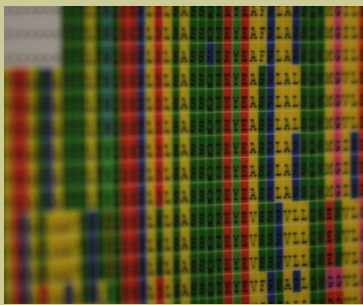
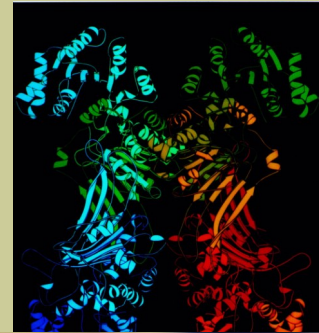


The University of Hong Kong



# Bachelor in Food and Nutritional Science

School of Biological Sciences  
Faculty of Science



# Food and Nutritional Science



What people eat has an important effect on their health and lives. Global concern over food and nutrition issues has risen rapidly in recent years, and demand has increased for experts to provide professional advice to health-conscious individuals and the food industry. The Food & Nutritional Science Major provides an appropriate training for these professionals. Students begin with a series of first-year foundation courses covering food chemistry, biochemistry and nutrition. In the second year, core courses in food processing, essential nutrients and food microbiology are supplemented by elective courses to suit individual interests. In the third year, a series of specialized courses enable students to concentrate more on “food science” or “nutritional science”. By judicious course selection, students are trained for a wide variety of career objectives within the food and nutrition areas.

## Objectives

The Food and Nutritional Science Major at the University of Hong Kong aims to offer an exciting, dynamic, and challenging environment to prepare the students for career opportunities in food and nutritional science. The goals of the programme are to provide the students with:

- (a) A detailed critical knowledge and understanding of the theoretical and practical aspects of food science and technology and nutrition and their relationship to human health.
- (b) A critical knowledge and understanding on the relationship between food safety and a wide range of social, legal, technological and environmental factors.
- (c) A curriculum meeting the requirements for higher degree in M.Phil and PhD and or the taught Master of Science degrees in the field of Food industry: Management and Marketing, Food Safety and Toxicology and the postgraduate diploma in dietetics.



The mission is to provide a progressive and effective program that integrates theoretical and experiential learning to better prepare students for the challenges of the workplace. Throughout the curriculum, there is consistent emphasis on experiential learning through laboratory studies, internship training, research-based learning, debate and presentations, designed to enhance the student's critical thinking,



communication and collaboration, tackling of ill-defined problems, development of individual learning objectives and self-evaluation of performance. Internship experiences can be gained in medical centers, schools, industries, government and community setting. Students majoring in this program are prepared for diverse careers in the food industry, government or private sector food and nutrition agencies, and scientific research laboratories, health-care and fitness facilities, hospitals, nutrition education and communication enterprises.



# Programme structure

## 1. Introductory level courses (18 credits)

|          |   |
|----------|---|
| BIOL1125 | Introduction to biochemistry <b>OR</b> CHEM1406 Basic organic chemistry<br><b>OR</b> CHEM1401 Fundamentals of organic chemistry |
| BIOL1514 | Nutrition and metabolism  |
| BIOL1528 | Food chemistry  |

## 2. Advanced level courses (48 credits)

|          |   |
|----------|---|
| BIOL2535 | Food processing and engineering laboratory course |
| BIOL2536 | Food and nutrients analysis laboratory course     |
| BIOL2537 | Laboratory in nutritional science                 |
| BIOL2218 | Human physiology                                  |
| BIOL2503 | Grain production & utilization                    |
| BIOL2507 | Meat and dairy science                            |
| BIOL2515 | Food microbiology                                 |
| BIOL2529 | Food and nutritional toxicology                   |
| BIOL2530 | Molecular biology and nutrigenomics               |
| BIOL2531 | Principles of Chinese medicinal diet              |
| BIOL2532 | Diet and disease                                  |
| BIOL2533 | Nutrition and life cycle                          |
| BIOL2534 | Nutrition and public health                       |
| BIOL3527 | Food safety and quality management                |
| BIOL3538 | Food product development                          |
| BIOL3540 | Diet, brain function and behaviour                |
| PBSL2229 | Exercise physiology                               |

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course
- BIOL2320 Directed studies in biological sciences
- BIOL3321 Biological sciences project
- BIOL3988 Biological sciences internship

### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

Experiential Learning:

Food Industry, Hospital, Government, Communities, Research...



# Course Contents

## **BIOL1514 Nutrition and metabolism**

Essential nutrients and their requirements. Energy balance and caloric value of foods. Metabolic control of macronutrient utilization. Nutritional impacts of hexoses, long chain polyunsaturated fatty acids and amino acids. Dietary recommendations.

## **BIOL1528 Food chemistry**

The course will cover food components including water, proteins, carbohydrates and lipids. Minor food components will include enzymes, vitamins, minerals, colorants, flavors and additives. The relationship of these components to food stability in terms of degradative reactions and processing will be discussed. The series of laboratory sessions will cover analysis of major and minor food components, protein chemistry, lipid oxidation, properties of sugars and starches, enzymatic and non-enzymatic browning reactions, and sensory analysis of foods.

## **BIOL2218 Human Physiology**

Overview of the physiological systems and homeostasis; Neural and hormonal communication; Nervous system physiology; The digestive system; Cardiac physiology, the blood vessels and blood pressure; The respiratory system; The urinary system; The skeletal & muscular system; Sensory mechanisms; Biological rhythms; Central-peripheral communication in energy homeostasis.

## **BIOL2503 Grain production and utilization**

Global grain production and consumption. International grain trade. Wheat: flour milling, dough rheology, the baking process and baking quality, quality of Asian products including steamed bread and noodles, gluten. Rice: nutritional quality and consumer preferences. Maize: products of wet-milling, animal feed development. Biofuels.

## **BIOL2507 Meat and dairy science**

Principles of animal nutrition and feed formulation; genetic selection and breeding of farm animals; slaughter and carcass grading; carcass inspection and meat safety; sensory quality of meat; meat preservation and freezing storage; meat and dairy product marketing.

## **BIOL2515 Food microbiology**

Detection and Enumeration of Microbes in Foods, Factors That Influence Microbes in Foods, Spores and Their Significance, Physical Methods of Food Preservation, Chemical Preservation and Natural Antimicrobial, Foodborne pathogens.

## **BIOL2530 Molecular Biology and Nutrigenomics**

Introduction of Nutrigenomics (nutrition, preventive medicine and personalized diets); chromosome structure and function; transcription; control of gene expression; epigenomics, genetic variations (Single nucleotide polymorphisms, SNPs); nutrient sensors (nuclear receptors). To highlight the relationship between diet x genotype and diseases, selected topics are used as examples: hyperphenylalanaemia; hyperlipidaemia; folic acid /homocysteine metabolism; metabolic syndrome (obesity, diabetes, insulin resistance); genetic susceptibility and cancer; polyunsaturated fatty acids in gene regulation.

## **BIOL2531 Principles of Chinese medicated diet**

Basic knowledge on the history and present status of development of Chinese medicated diet will be discussed. The basic theory, classification, and application of Chinese medicated diet will be covered. The formulation is based on Traditional Chinese Medicine (TCM) theory. Scientific evaluation on the role of special food ingredients to reduce the risk of chronic diseases such as cancer, cardiovascular diseases, diabetes etc. will be provided

## **BIOL2532 Diet and Disease**

Foundations of nutrition, nutrition throughout the life cycle. Dietary excess and deficiency. Calorie intake and regulation. Dietary regulation in disease states: e.g. diabetes mellitus, cardiovascular diseases, cancer, gastrointestinal diseases, obesity etc. Nutrition and immune system. Clinical nutrition, principles and application of nutrition in health promotion.

## **BIOL2533 Nutrition and Life Cycle**

This course covers both physiological and psychology developmental factors in determining nutrients requirement during the human life cycle: pregnancy and lactation, infancy, childhood, adolescence, adult years, aging. Guidelines for general dietary planning will be discussed.



## **BIOL2534 Nutrition and Public Health**

The underlying principles of community health nutrition will be presented. Nutrition practice in the community, needs and sources for dietary and clinical assessment of nutrients, international and national nutrition guidelines and goals, design of nutrition programs; enteral and parenteral nutrition support, understanding of nutrients safety, food labelling, nutrients interaction; integrative medicine and phototherapy.

## **BIOL2535 Food processing and Engineering Laboratory course**

This course covers the basic principles and major methods in food processing, preservation and engineering: Unit operation, high and low temperature processing, concentration, dehydration, moisture control and miscellaneous processes. Traditional and novel packaging materials and systems. Mathematical modeling and simulation of food processes.

## **BIOL2536 Food and Nutrients Analysis Laboratory course**

This course covers the key concepts in professional food analysis in an industry context. Basic analytical techniques for macronutrients (e.g. protein, carbohydrate and fats), micronutrients (vitamins and minerals) and adulterants in food will be covered. A variety of classical and instrumental techniques used in food analysis will be discussed: Rheology and texture measurement, color, spectroscopy, chromatography and electrophoresis.

## **BIOL2537 Laboratory in nutritional science**

1. A comprehensive training on laboratory techniques, experimental approaches, use of different model systems and writing of scientific papers for nutrition studies.
2. Introduction on basic techniques of dietary survey and design of questionnaires for meal planning and analyses analysis.
3. The utility of experimental animals for the investigation of nutrients metabolism and disease relationship.
4. The utility of human as an experimental model for the investigation of diet and body function, nutrient-nutrient interaction, i.e. the impact of dietary fiber and protein quality, calcium malabsorption and vitamin C intolerance etc.
5. Various culture studies for gene-nutrient interaction. Basic molecular techniques such as PCR will be employed.

## **BIOL2538 Nutraceuticals and functional foods**

Concept, history and global regulation of nutraceuticals and functional foods; classification of nutraceuticals and functional foods based on chemical structures; unsaturated fatty acids, carotenoids and dietary fibers as healthy ingredients; health benefits of phenolics, terpenes, sterols and sulphur-containing compounds; probiotics and prebiotics; spices, teas and herbs for health; quality control and assurance of nutraceuticals and functional foods; novel processing technology in nutraceuticals and functional foods.

## **BIOL2540 Basics of Toxicology**

Principles of Toxicology: toxicokinetics and toxicodynamics; Carcinogenic and mutagenic effects of food toxins; Biotransformation of food toxicants; Measurements of food toxins and evaluation of their toxicity; Toxicity of dietary constituents; Food additives; Toxicants resulting from food processing; Toxicants and antinutrients in plant foods; Fungal toxins; Bacterial toxins; Seafood toxins and poisoning; Toxic metals, radionuclides and packaging; Pesticides and industrial contaminants.

## **BIOL3527 Food Safety and quality management**

Part 1: The regulatory, social and business imperative for food safety. Development and implementation of a Hazard Analysis Critical Control Point (HACCP) plan. Inter-relationships of HACCP and other quality management techniques such as ISO9000.

Part 2: Use of the business case study method to provide realistic exposure to the decision-making process in the food industry. A series of cases in manufacturing, marketing and catering, will be analyzed and discussed in class.

## **BIOL3538 Food product development**

Predicting the future in the food industry; industrial product development process; idea generation and prototype development for new food products; quality management and legal protection; marketing strategies; food labelling; food package design; new product development for different food industries.

## **BIOL3540 Diet, Brain function and Behavior**

Fundamentals of the central nervous system; Nutrition & brain development; Diet, learning & memory function; Dietary CNS stimulants; Neurotransmitters, drugs & behaviour; Physiological and socio-cultural determinants of dietary behaviour.

## Professor Rudolf S S WU, Director

PhD (British Columbia)

**Professor Rudolf Wu** is the Chair Professor and the Director of the School of Biological Sciences. He is also the Director of the Centre for Marine Environmental Research and Innovative Technology (*MERIT*), one of the "Areas of Excellence" (*AoE*) selected by the University Grants Committee (*UGC*), the government of Hong Kong SAR.



Professor Wu's research primarily focuses on the molecular, biochemical, physiological and ecological responses of marine animals to environmental stresses, with a particular emphasis on hypoxia and xenobiotics. The overall objectives are to unravel the toxic mechanisms involved and to develop novel biomarkers for detecting and predicting environmental changes. He has published one book, five book chapters, and 195 papers in leading journals in marine environmental sciences and environmental toxicology. Professor Wu is the associated editor of four international journals and was the Chief Guest Editor of five special issues of the journal "*Marine Pollution Bulletin*".

## Research Interests

Marine Pollution, Marine Ecology, Ecotoxicology, Mariculture

## Representative Publications

1. **Wu, R.S.S.** (2009). Effects of hypoxia on fish reproduction and development. In: *Fish Physiology* (eds. J.G. Richards, A.P. Farrell and C.J. Brauner) Academic Press. Volume 27, pp. 79-141.
2. Zhang, X., M. Hecker, J.-W.Park, A.R.Tompsett, J.L. Newsted, K. Nakayama, P.D. Jones, D. Au, R. Kong, **R.S.S. Wu**, and J.P. Giesy. (2008). Real time PCR array to study effects of chemicals on the Hypothalamic-Pituitary- Gonadal axis of the Japanese medaka. *Aquatic Toxicology* **88**:173-182.
3. **Wu, R.S.S.**, Chan, A.K.Y., Richardson, B.J., Au, D.T.W., Fang, J.K.H., Lam, P.K.S. and Giesy, J.P. (2008). Measuring and monitoring persistent organic pollutants in the context of risk assessment. *Marine Pollution Bulletin* **57**:236-244.
4. R.Y.C. Kong, J.P. Giesy, **R.S.S. Wu**, E.X.H. Chen, M.W.L. Chiang, P.L. Lim, B.B.H. Yuen, B.W.P. Yip, H.O.L. Mok, D.W.T. Au, (2007). Development of a marine fish model for studying *in vivo* molecular responses in ecotoxicology. *Aquatic Toxicology* **86**: 131-141.

### Professor Steven F. Chen

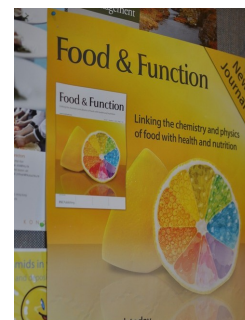
B.Sc. (SCUT)  
M. Eng. Sc., Ph.D. (Queensland)

*Professor*



### Research Interests

1. High-yield production of astaxanthin, lutein, phycocyanin, long-chain polyunsaturated fatty acids, and bioactive proteins by microalgae and cyanobacteria in heterotrophic and mixotrophic cultures.
2. Mechanism of formation of secondary metabolites in microalgae in heterotrophic culture.
3. Metabolic engineering of carotenoid biosynthesis and glucose transportation in green microalgae and cyanobacteria. Biodiesels from microalgae – process optimization and genetic manipulation.



### Representative Publications

1. Xu, Y., Chiu, J.F., He, Q.Y. & **Chen, F.\*** (2009). Tubeimoside-1 exerts cytotoxicity in HeLa cells through mitochondrial dysfunction and endoplasmic reticulum stress pathways. *Journal of Proteome Research*, 8, 1585-1593.
2. Zeng, X.H., Cheng, K.W., Jiang, Y., Lin, Z.X., Shi, J.J., Ou, S.Y., **Chen, F.** & Wang, M.F. (2009). Inhibitory of acrylamide formation by vitamins in model reactions and fried potato strips. *Food Chemistry*, 116, 34-39.
3. Chen, T., Wei, D., Chen, G., Wang, Y. & **Chen, F.\*** (2009). Employment of organic acids to enhance astaxanthin formation in heterotrophic *Chlorella zofingiensis*. *Journal of Food Processing and Preservation*, 33, 271-284 (invited paper).
4. Zhu, Q., Liang, C.P., Cheng, K.W., Peng, X.F., Lo, C.Y., Shahidi, F., **Chen, F.**, Ho, C.T. & Wang, M.F. (2009). Trapping effects of green and black tea extracts on peroxidation-derived carbonyl substances of seal blubber oil. *Journal of Agricultural and Food Chemistry*, 57, 1065-1069.

## Dr. Harold Corke

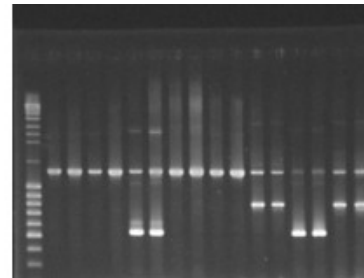
BScAgric (Rhodesia), MSc (Guelph),  
MBA (W Ontario), PhD (Weizmann Inst)

*Associate Professor*



### Research Interests

1. **Biomaterials development and characterization for human health.** This draws on my experience with identification and quantification of antioxidants in medicinal plants. By developing dietary sources of beneficial compounds, natural dietary interventions can be made to improve health.
2. **New crop development for bioactive materials and other added-value applications.** Examples include crops that can provide high-value fractions of squalene (Amaranthus) and antioxidants (for example polyphenols from sorghum, and some medicinal plants).
3. **Food quality, emphasizing Asian starch-based foods** – quality parameters and analytical methods, and chemical and physical modification of starch for extended and targeted functional properties. Genetics and breeding for starch physical quality in rice and wheat. Eating quality of rice.



### Representative Publications

1. Bao, J., Jin, L., Lu, Y. Xiao, P., Sun, M., and **Corke, H.** (2010) Genetic diversity and population structure of a diverse set of rice germplasm for association mapping. *Theoretical and Applied Genetics* 121: 475-487.
2. Jin L, Lu Y, Shao Y.F., Zhang, G., Xiao, P., Shen, S.Q., **Corke, H.**, and Bao, J.S. (2010) Molecular marker assisted selection for improvement of the eating, cooking and sensory quality of rice (*Oryza sativa* L.). *Journal of Cereal Science* 51: 159-164.
3. Zhu, F., Cai Y.Z., Yang, X.S., Ke, J.X., and **Corke, H.** (2010) Anthocyanins, hydroxycinnamic acid derivatives, and antioxidant activity in roots of different Chinese purple-fleshed sweetpotato genotypes. *Journal of Agricultural and Food Chemistry* 58: 7588-7596.
4. Zhu, F., Cai Y.Z., Ke, J.X., and **Corke, H.** (2010) Compositions of phenolic compounds, amino acids and reducing sugars in commercial potato varieties and their effects on acrylamide formation. *Journal of the Science of Food and Agriculture* 90: 2254-2262.



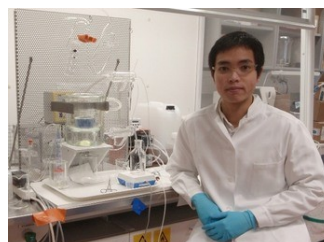
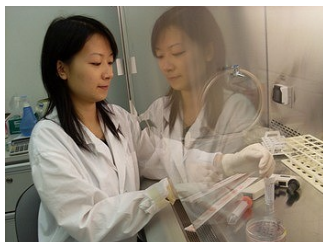
**Dr. Hani S. El-Nezami**

BSc (Alexandria University, Egypt)  
MAppSc, PhD (RMIT-University, Australia)

*Associate Professor*

**Research Interests**

1. Exposure to food contaminants (both natural and synthetic) in different populations who are at risk of exposure to these contaminants with a special focus on vulnerable population groups (including pregnant and lactating women, infants and young children) in developing countries. The ultimate goal of this research theme is to develop intervention strategy to reduce the risk associated with such exposure.
2. Gut derived microbial exposure in health and disease. Under this theme our group is actively working on the (i) characterization of the effects of selected gut microbes and probiotics on immunological and barrier functions of gut epithelium, (ii) determination the relevance of intestinal microbiota composition in development and severity of mouse model of atherosclerosis and type 2 diabetes and potential efficacy of probiotic therapy, and (iii), evaluation the potential of gut derived probiotic bacteria to prevent the development and/or the progression of liver diseases.

**Representative Publications**

1. Partanen, H.A., **El-Nezami, H.S.**, Leppanen, J.M., Myllynen, P.K., Woodhouse, H.J. and Vahakangas, K.H. (2010) Aflatoxin B1 transfer and metabolism in human placenta. *Toxicological Sciences*; 113:216-25.
2. Gratz, S., Mykkanen, H. and **El-Nezami, H.** (2010) Probiotics and gut health : A special focus on liver disease. *World Journal of Gastroenterology*; 16:403-10.
3. Salminen, S., Nybom, S., Meriluoto, J., Collado, M., Vesterlund, S. and **El-Nezami, H.** (2010) Probiotic pathogen/toxin interaction - benefits to human health and nutrition?. *Current opinion in biotechnology*; 21: 157-167.
4. Turner, P.C., Wu, Q.K., Piekkola, S., Gratz, S., Mykkanen, H. and **El-Nezami, Hani.** (2008) *Lactobacillus rhamnosus* strain GG restores alkaline phosphatase activity in differentiating Caco -2 cells dosed with the potent mycotoxin deoxynivalenol. *Food and chemical toxicology*; 46, 2118-23.

**Dr. Edmund T.S. Li**

B.Sc., MSc., Ph.D. (Toronto)

*Associate Professor***Research Interests**

1. **Developmental programming.** A systematic approach is used to examine the impacts of maternal overnutrition on disease risk of offspring in later life.
2. **Bioactive food components and metabolic syndrome.** Bitter melon juice and green tea extract possess strong antioxidant, and blood glucose and lipid lowering properties. Their potential roles as dietary supplement against metabolic syndrome during pregnancy and in offspring are being explored.
3. **Anthropometry.** The higher body fat content of Asians predisposes them to diabetes and its complications. Anthropometric cutoffs and their relations with biochemical markers are examined and compared among ethnic groups.

**Representative Publications**

1. Ching RHH, Yeung LOY, Tse IMY, Sit WH and Li ETS. (2011) Supplementation of bitter melon to rats fed a high-fructose diet during gestation and lactation ameliorates fructose-induced dyslipidemia and impaired hepatic antioxidant status in male offspring. *Journal of Nutrition* (in press)
2. Cheung YTD, Lee AM, Ho SY, Li ETS, Lam TH, Fan S and Yip PSF. Who wants a slimmer body? Impact of body weight status and socio-demographics on body shape dissatisfaction among young adults. *BioMed Central* (accepted)
3. HeM, Li ETS, Harris S, Huff M, Yau CY and Anderson GH. (2010) Canadian global village reality: anthropometric surrogate cutoffs and metabolic abnormalities among Canadians of East Asian, South Asian, and European descent. *Canadian Family Physician* 56(5):e174-182.
4. So, MHH, Tse IMY and Li ETS. (2009) Dietary fat concentration influences the effects of trans 10, cis-12 conjugated linoleic acid on temporal patterns of energy intake and hypothalamic expression of appetite- controlling genes in mice. *Journal of Nutrition* 139: 145-151, 2009.

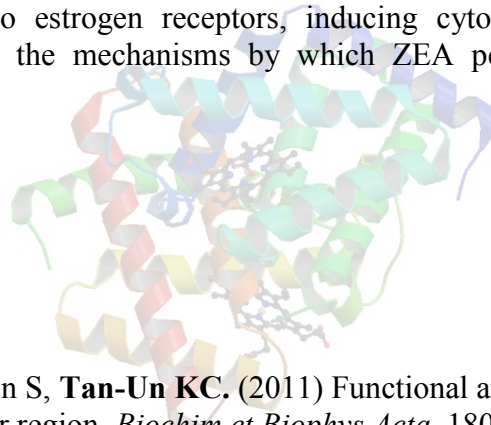
**Dr. K.C.Tan-Un**

BSc (Hons) Biochemistry, Bath University, UK  
 MSc Nutrition, King's College, London  
 PhD Biochemistry, HKU

*Associate Professor*

**Research Interests**

1. **Cytoglobin (CYGB), a recently discovered member of the vertebrate globin superfamily.** We have reported that CYGB was up-regulated during hypoxia (low oxygen) suggesting it may play a role in the cytoprotection of cells against oxidative stress.
2. **Induced pluripotent stem (iPS) cells from Friedreich Ataxia (FRDA) patients.** We are investigating the roles of frataxin (FXN) and neuroglobin (NGB) in cell survival. The potential role of NGB in neuroprotection and in alleviating the oxidative stress is addressed.
3. **Environmental and dietary influences on the epigenetic control of gene expression.** Zearalenone (ZEA), a mycotoxin, binds to estrogen receptors, inducing cytotoxicity and genotoxicity. We are trying to understand the mechanisms by which ZEA perturbs gene expression.

**Representative Publications**

1. Zhang W, Tian Z, Sha S, Cheng LY, Philipsen S, **Tan-Un KC.** (2011) Functional and sequence analysis of human neuroglobin gene promoter region. *Biochim et Biophys Acta.* 1809(4-6):236-44.
2. Man KN, Philipsen S, **Tan-Un KC.** (2008) Localization and expression pattern of cytoglobin in carbon tetrachloride-induced liver fibrosis. *Toxicol Lett.* 183(1-3):36-44
3. Chan PK, Wai A, Philipsen S, **Tan-Un KC.** (2008) 5'HS5 of the Human b-globin Locus Control Region Is Dispensable for the Formation of the b-globin Active Chromatin Hub. *PLoS ONE.* 3 (5):e2134
4. Guo X, Philipsen S, **Tan-Un KC.** (2007) Study of hypoxia-dependent regulation of human CYGB gene. *Biochem Biophys Res Commun* 364:145-150

## Dr. Mingfu Wang

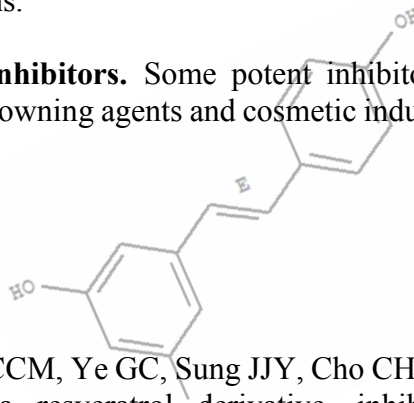
B.Sc. (Ocean University of China)  
M.S. (Chinese Academy of Science)  
Ph.D. (Rutgers)

*Associate Professor*



### Research Interests

1. **Prevention of diseases by dietary phytochemicals and traditional Chinese herbal medicines.** Discovery of some novel natural products for health benefits.
2. **The formation mechanism of food-borne toxicants.** Development of novel strategy to lower their formation in thermally-processed food products. Heterocyclic amines, acrylamide, advanced glycation endproducts and furans.
3. **Novel tyrosinase/polyphenol oxidase inhibitors.** Some potent inhibitors would likely find applications in the food industry as anti-browning agents and cosmetic industry as skin whitening agents.



### Representative Publications

1. Li H, Wu WKK, Li ZJ, Ming CK, Wong CCM, Ye GC, Sung JJY, Cho CH and **Wang M.** (2010) 2,3',4,4',5'-Pentamethoxy-trans-stilbene, a resveratrol derivative, inhibits colitis-associated colorectal carcinogenesis in mice, *British Journal of Pharmacology*, 160: 1352-1361.
2. Chao J, Li H, Cheng KW, Yu MS, Chang RCC, **Wang M.** (2010) Protective effect of pinostilbene, a resveratrol methylated derivative against 6-hydroxydopamine-induced neurotoxicity in SH-SY5Y Cells. *Journal of Nutritional Biochemistry*, 21: 482-489.
3. Cheng KW, Wong CC, Chao J, Lo C, Chen F, Chu IK, Che CM, Ho CT and **Wang M.** (2009) Inhibition of mutagenic PhIP formation by EGCG via scavenging of phenylacetaldehyde. *Molecular Nutrition and Food Research*, 53: 716-725.
4. Chao J, Yu MS, Ho YS, **Wang M** and Chang RCC. (2008) Dietary oxyresveratrol prevents Parkinsonian mimetic 6-hydroxydopamine neurotoxicity. *Free Radical Biology and Medicine* 7: 1019-26.

**Dr. Jennifer M. F. Wan**

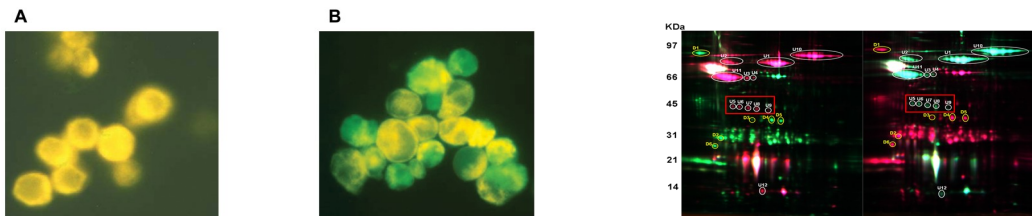
Bsc (Lon.)  
 Ph.D (Southampton)  
 Bsc in Traditional Chinese Medicine (Beijing)

*Associate Professor*

**Research Interests**

Major contributions are in the fields of Proteomics, Cancer Biology, Chinese Medicine, Dietary Lipids and Cancer, Nutrition and Immunology.

- 1. Research and development of proteomic and metabolomic technology**  
 Disease models studied: Necrotizing Enterocolitis and Cancer
- 2. Dietary lipids and cancer research**  
 Detailed anticancer mechanisms (cell proliferation and cell death) on how omega-3 fish oil and olive oil can retard cancer cells growth and apoptosis. Mathematical models were used to express the mechanistic influence of the omega-3 and omega-6 fatty acids on cancer cells based on cell cycle progression through the Go/G1 phase, DNA S phase, and G2/M mitotic phase of the cell cycle.
- 3. Chinese medicine and immunity research**  
 Discovery of Chinese medicinal mushrooms with therapeutic potential for auto immune diseases.

**Representative Publications**

- Jiang PP, Sangild PT, Siggers JL, Sit WH, Lee CL, **Wan JM**. (2010) Bacterial Colonization Affects the Intestinal Proteome of Preterm Pigs Susceptible to Necrotizing Enterocolitis. *Neonatology* 99(4):280-288.
- Lee CL, Jiang P, Sit WH, Yang X, **Wan JM**. (2010) Regulatory properties of polysaccharopeptide derived from *Coriolus versicolor* and its combined effect with ciclosporin on the homeostasis of human lymphocytes. *J Pharm Pharmacol.* 62(8):1028-36.
- Lee CY, Sit WH, Fan ST, Man K, Jor IW, Wong LL, Wan ML, Tan-Un KC, **Wan JM**. (2010) The cell cycle effects of docosahexaenoic acid on human metastatic hepatocellular carcinoma proliferation. *Int J Oncol.* 36(4):991-8.
- Jiang PP, Sangild PT, Sit WH, Ngai HH, Xu R, Siggers JL, **Wan JM**. (2009) Temporal proteomic analysis of intestine developing necrotizing enterocolitis following enteral formula feeding to preterm pigs. *J Proteome Res.* 8(1):72-81.

## Dr. Chung-Yung Jetty Lee

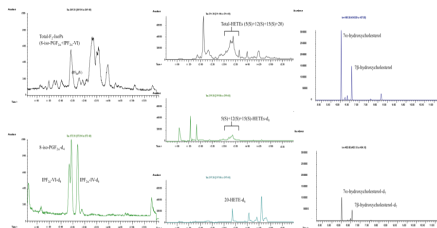
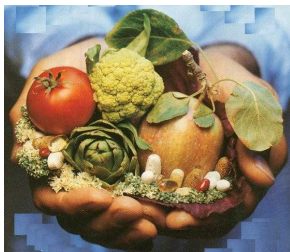
B.Agr. (Korea University)  
M.Phil. Ph.D. (Hong Kong)

*Assistant Professor*



### Research Interests

1. **Lipid Oxidation Biomarkers.** Oxidative stress biomarkers related to arachidonic acid, docosahexaenoic acid, eicosapentaenoic acid and cholesterol are determined using healthy disease models exposed to environmental pollutants and vascular related diseases (stroke, diabetes).
2. **Antioxidant and Oxidative Stress in Human Nutrition.** The antioxidant/oxidative stress balance of food components and supplements (e.g. dark soy sauce, tomato, zinc) in healthy, vascular related disease patients and cancer patients under radio/chemotherapy.
3. **Fatty Acid Metabolites and Lipidomics.** Develop method for measurement of potential neuroprotectants e.g. Resolvin D and neuroprotectin D derived from docosahexaenoic acid and other fatty acids using LC tandem mass spectrometry and GC/MS.



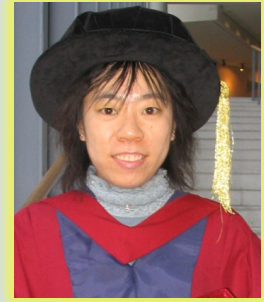
### Representative Publications

1. Halliwell B. and C.Y.J. Lee (2010). Isoprostanes as biomarkers of oxidative stress. Some rarely considered issues. *Antioxidant & Redox Signaling*. 13:145-156.
2. Lee, C.Y.J., R.C.S. Seet, S.H. Huang, L.H. Long and B. Halliwell (2009). Different patterns of oxidized lipid products in plasma and urine of dengue fever, stroke and Parkinsons disease patients. Cautions in the use of biomarkers of oxidative stress, *Antioxidant and Redox Signaling* 11: 407-420.
3. Lee, C.Y.J., H.B. Isaac, H. Wang, S.H. Huang, L.H. Long, A.M. Jenner, R.P. Kelly and B. Halliwell (2006). Cautions in the use of biomarkers of oxidative damage; the vascular and antioxidant effects of dark soy sauce in humans. *Biophysical and Biochemical Research Communications* 344: 906-911.

## Dr Emily S.M. Choi

B.Sc. Hon. (HKU),  
Ph.D. (HKU)

*Teaching Coordinator*



### Research Interests

1. **Study of food proteins.** The structure-function relationships in plant proteins and how the functional properties of proteins can be affected by different processing treatments. Improving functional properties of food protein to facilitate production of products with desired properties.
2. **Determination of harmful substances in food.** Pesticide residues in fruit/ vegetables using mass spectrometry. Chemical hazard evaluation of acrylamide in coffee. Study of natural toxins in food plants and ethyl carbamate in wines.
3. **Applications of vibrational spectroscopy on polysaccharide and hydrocolloid ingredients.** Study the effect of chemical modifications on non-starch polysaccharides using different vibrational spectroscopic techniques.



### Representative Publications

1. Yuen S.N., **Choi S.M.**, Phillips D.L. and Ma C.Y. (2009) Raman and FTIR spectroscopic study of carboxymethylated non-starch polysaccharides. *Food Chemistry* 114: 1091-1098.
2. **Choi S.M.** and Ma C. Y. (2007) Structural characterization of globulin from common buckwheat (*Fagopyrum esculentum* Moench) using circular dichroism and Raman spectroscopy. *Food Chemistry* 102: 150-160.
3. **Choi S.M.** and Ma C. Y. (2006) Study of thermal aggregation of globulin from common buckwheat (*Fagopyrum esculentum* Moench) by size-exclusion chromatography and multi-angle laser light scattering. *Journal of Agricultural and Food Chemistry* 54: 554-561.
4. Ellepola S.W., **Choi S.M.**, Phillips D.L. and Ma C.Y. (2006) Raman Spectroscopic Study of Globulin from Rice (*Oryza sativa*) Seeds. *Journal of Cereal Science*. 43: 85-93.

## Dr. Lilia S. Collado

BSc Food Tech; MSc Food Sc.  
(The University of the Philippines)  
PhD (The University of Hong Kong)

*Teaching Coordinator*



### Research Interests

1. **Starch physico-chemical properties and functionality.** Evaluation of starches for suitability for specific food uses; development of functional starch based food ingredients such as resistant starches with antihyperglycemic and bifidogenic properties.
2. **Value-added processing of rootcrops and legumes.** Utilization of nonconventional starch crops as alternative substrates for processed foods from traditional grain crops; development of quality assurance indicators through rapid laboratory small scale tests.



### Representative Publications

1. Lu Z.H. and **Collado, L.S.** (2010). Rice and Starch-Based Noodles Chapter 16 pp393-433. in: Asian Noodles: Science, Technology and Processing . Hou, G.G. (ed). John Wiley & Sons, Inc., ISBN: 978-0-470-17922-2.
2. **Collado, L. S.** and Corke., H. (2004). Noodles/Starch. pp. 293-304. In: Encyclopedia of Grain Science. Vol. II. C. Wrigley, H. Corke and C. E. Walker (eds). Elsevier. San Diego, CA 92101-4495. ISBN: 0-12-765490-9.
3. Tam, L.M., Corke, H., Tan, W. T. Li, J.S. and **Collado, L.S.** (2004). Production of bihon-type noodle from maize starch differing in amylose content. Cereal Chem. 81(4):475-480.
4. **Collado, L.S.** and Corke, H. (2003). Starch properties and functionalities. pp. 473-506 in: Characterization of Cereals and Flours: properties, analysis and applications. G. Kaletunc and K.J. Breslauer. (eds) Marcel Dekker, Inc. NY.





# Career Prospects

Food and Nutritional Science

## Positions held by the graduates

- ☉ Senior Health Inspector, Food & Environmental Hygiene Department, HKSAR Government
- ☉ Quality Control Officer, Vitasoy International Holdings Ltd.
- ☉ Head of Dietary Department, Tsuen Wan Adventist Hospital
- ☉ Quality Assurance Officer, Cathay Pacific Catering Services (HK) Ltd.
- ☉ Food Technician, Amoy Food Ltd.
- ☉ Nutritionists



## Graduates Sharing

### Heidi Ngai

1999 BSc (Biological Science, HKUST)  
2001 MSc (Nutrition and Dietetics, University of Wollongong, Australia)  
2007 PhD (Division of Food and Nutritional Sciences, HKU)

Assistant Programme Director, College of Life Sciences and Technology of HKU SPACE

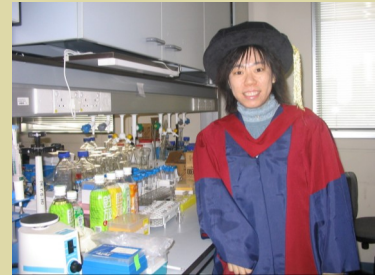


After working as a clinical dietitian under Hospital Authority and in the private setting, I spent four years in the Division of Food and Nutritional Sciences to carry out proteomics research and earn my PhD in nutritional sciences. The FNS programme not only provided excellent academic staff with strong background but also created a supportive and friendly environment for me to learn and to develop my career. The time in the laboratory was incredibly fruitful and unforgettable. Together with my supervisors and labmates, our never-ending discussions were always constructive with countless innovative ideas generated. Many professors in the division of FNS became my mentors and friends with close contact till now. Upon graduation, I received my post-doctoral research training in the Faculty of Medicine, HKU and followed that I entered the College of Life Sciences and Technology of HKU SPACE as Assistant Programme Director since 2008.

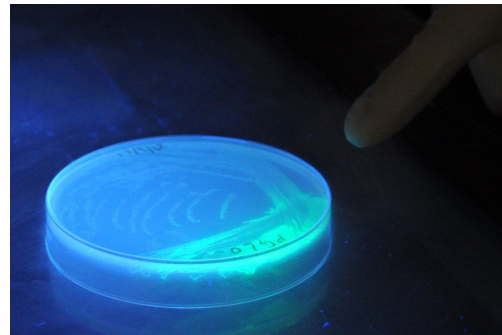
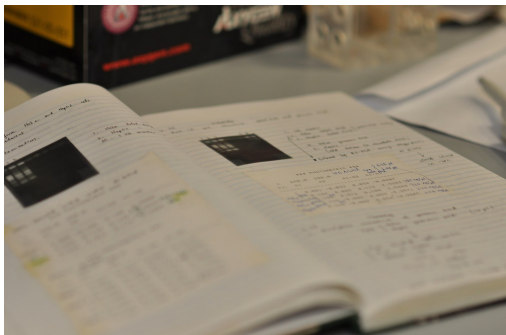
## Emily Choi

2000 BSc (Food and Nutritional Science) graduate  
2005 PhD (Food Science) graduate

Teaching Coordinator, School of Biological Sciences,  
The University of Hong Kong.



“The BSc programme provides specialized training in various aspects of the food and nutritional sciences including food processing technology, food safety, food product development, combined with theories of nutrition, diet and disease. The three-year study strongly enhanced my interest in the research area so much that I decided to get started with my four-year PhD study in Food Science. Now I work as a teaching coordinator for the FNS programme (HKU). My responsibility is to coordinate food-related courses and laboratory sessions, deliver lecture to undergraduate students and supervise postgraduate students in their research work. Studying at HKU positively explores my potential and turns my interest into a career. I am proud to be a HKU graduate.”



## Cora Wong

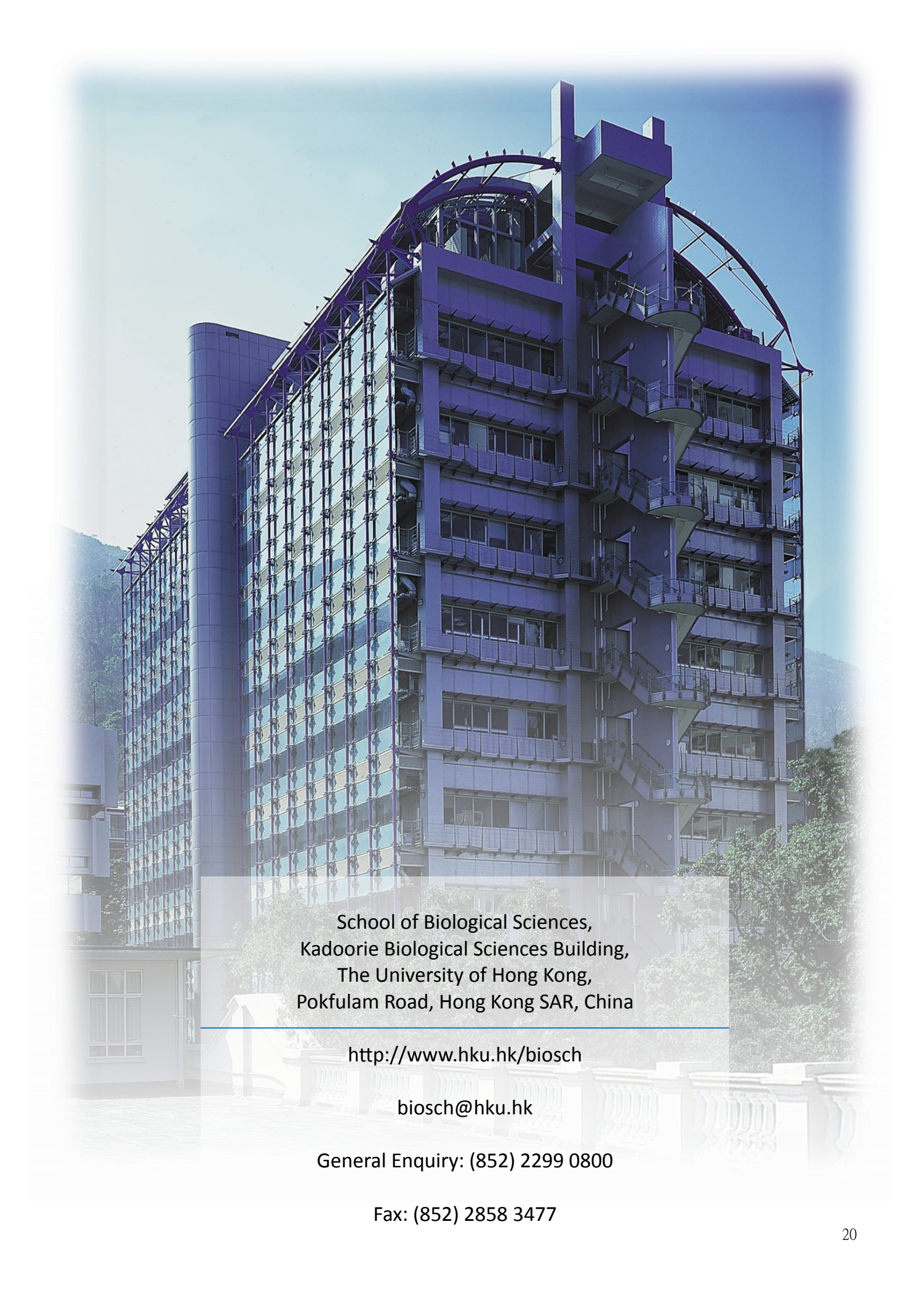
BSc (Food and Nutritional Science) graduate  
PgD, HKUSPACE  
SRD (UK)  
MPhil Graduate

Manager (Senior Dietitian), St James' Settlement

“My clients are from everywhere in the society. I am responsible for designing the catering menu for our service users including the elderly in our centre, residential homes, meals-on-wheel services as well as school meals for students. I also promote community nutrition and health through regular talks, seminars and training programmes. Providing consultancy services and individual counseling on diet therapy and nutrition related aspects to the public are also my job duties. The training from HKU Science gave me the basics for food and nutritional science and training in evidence based problem solving. And I am happy to see the recognition for HKU graduates.”

# Students Lives





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