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**FOREWORD**

### Pursuit of excellence

The pursuit of excellence has been and always will be a time-honored tradition in our Department. Not only do we respond to and overcome challenges, we also stand at the forefront of changes, making discoveries and breakthroughs in our discipline.

Succession planning and mentoring of young pathologists and basic scientists have become our foremost priorities in the past 3 years. With the concerted efforts of our colleagues, we have also made solid progress and achieved encouraging results in academic research, medical education and other areas.

Competitive research grants continued to be awarded to our staff in the past 3 years, including those from the HK Research Grants Council, HK Health and Medical Research Fund, and other research funding schemes. Our department's high scholarly and research achievements have attracted the prestigious Croucher Senior Research Fellowship awards to our academic colleagues, one each year from 2011 to 2015.

With tremendous effort by our teachers, great strides have been made in our online teaching. The results are enthusiastically received by those who have experienced the new pedagogy, including specific commendation by the HK Medical Council in its HKU MBBS 2013 accreditation report. We also continue our mission to advance other areas in Pathology teaching. Our Postgraduate Course in Molecular and Diagnostic Pathology has begun its second teaching cycle, with encouraging enrolment by medical professionals not only from HK, but also Australia, Canada, Russia, Saudi Arabia, Philippines, Mainland China and Macau.

Through various measures and regular meetings, our partnership with Hospital Authority colleagues has been further strengthened since 2013. We have actively participated in the clinical pathology service of the HKU-Shenzhen Hospital and the development of new hospital and community health projects.

Since 2013, three consecutive annual Hong Kong Pathology Forums hosted by our Department have been held, uniting pathologists in the city with unprecedented participation. We also hosted and shall host a number of courses attended by high-caliber participants and internationally renowned speakers from around the globe, including the Croucher Summer Course in Cancer Biology (2013, 2015 and 2017) and in Immunology (2014, 2016 and 2018), Croucher Advanced Study Institute in Tumor Microenvironment (2013), and the State Key Laboratory for Liver Research Symposium (yearly from 2011 to 2015).

We pledge to continue to jointly create the biggest room for colleagues to develop and excel, and make concerted effort for all to work together to move forward.

*Individually we excel and together we move forward*

---

*Irene O.L. Ng*
Chair Professor and Head
Loke Yew Professor in Pathology
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Individually we excel and together we move forward

Irene O.L. Ng
Chair Professor and Head
Loke Yew Professor in Pathology
INTRODUCTION

The Department has, in the past four years, flourished under the leadership of Professor Irene Ng. The department builds on the excellence in basic and clinical research fostered over decades by its former heads, who both increased the clinical strength of the Department and established a robust, highly competitive basic science program. The research excellence of the Department’s faculty continues to win awards, including several prestigious Croucher Senior Research Fellowships to Professors Annie Nga Yin Cheung, Khoo Ui Soon and Lu Liwei as well as Endowed Laurence LT Hou Professorships in Anatomical Molecular Pathology to Professor Annie Nga Yin Cheung. Notable achievements are obtained by the state-of-the-art State Key Laboratory for Liver Research under the leadership of Professor Ng, as well as by the cutting-edge metabolomics laboratory guided by Professor Lam Ching Wan. Professor SY Leung has identified new key driver mutations in gastric cancer. The faculty members continue to produce other impressive results. The Hong Kong Pathology Forum, now organized by the department annually, is a platform for local pathologists and other clinical specialists to meet, share and update knowledge.

TW Mak
October 2015

Professor Tak Mak
Director
The Campbell Family Institute for Breast Cancer Research
Ontario Cancer Institute, Princess Margaret Hospital, Canada
Senior Scientist
Division of Stem Cell and Developmental Biology
Advanced Medical Discovery Institute / Ontario Cancer Institute, Canada
Honorary Professor
Department of Pathology
The University of Hong Kong
Honorary Fellow
Hong Kong College of Pathologists

“A radical in his youth, a revolutionary in research, Tak Mak is now a true and dedicated scientist who has finally found his true passion” - Pasteur Institute 2003

In 1984, Tak Mak published a groundbreaking scientific paper on the cloning of the T cell receptor gene, a key component of the human immune system, and shaped the direction of research in immunology and genetics. His pioneering work in designing and advancing the use of genetically altered mice has provided key insights into molecular pathways of cancer at the cellular level.

He has won international recognition in the forms of the Emil von Behring Prize, the King Faisal Prize for Medicine, the Gairdner Foundation International Award, the Sloan Prize of the General Motors Cancer Foundation, the Paul Ehrlich Prize and the Novartis Prize in Immunology.

He is an Officer of the Order of Canada, a Foreign Associate of the National Academy of Sciences (USA) and a Fellow of the Royal Society of London (UK).
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“The only constant in Tak Mak’s career has been change. After jumping from a Jesuit seminary to engineering, to immunology and genetics, the scientific vagabond says he has finally found his true passion” - Nature Medicine 2003

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MISSION

A world class Department of Pathology

Objectives

To develop and provide the highest quality diagnostic pathology and screening services in Hong Kong, Mainland China and the Asia-Pacific Region.

To instill in students and health-care professionals the importance of pathology as a scientific foundation for understanding diseases and all applied aspects of medicine.

To foster excellence in research into the pathogenesis of human diseases through harnessing the frontiers of scientific knowledge and technology.

To provide the highest quality patient care and management through synergistic partnership and collaboration with clinicians.

TW Mak
October 2015

July 2015 Li Ka Shing Faculty of Medicine Complex
HISTORY

The growth and development of the Department of Pathology owes a great deal of gratitude to the Universities of Scotland. Professor C.Y. Wang, a graduate of the Hong Kong College of Medicine obtained his M.D. from Edinburgh, and was the first Professor of Pathology and was appointed in 1930. At the time the predominant causes of mortality were tropical diseases, mainly infections and parasites. Professor Wang's research concentrated on tuberculosis and he was to die of the disease in 1930. He was succeeded by Professor L.J. Davis (1899-1980) who had previously worked at the Wellcome Tropical Disease Research Laboratories from 1927-1930 until 1939 when he left to become director of medical laboratories in Bulawayo in Southern Rhodesia. His position was taken over by Professor R.C. Robertson who was a graduate from Glasgow University.

Professor R.C. Robertson had previously headed the Lester Institute of Research in Shanghai before coming to Hong Kong. Almost as soon as he was appointed he began to organize a diploma course in tropical medicine and hygiene. He was regarded as a man of boundless physical and moral courage, a keen humanitarian, and a champion of the cause of the Chinese. He strove zealously to improve the hygiene of the Chinese populations but his efforts were curtailed with the invasion of Hong Kong in 1941. He was held under house arrest following the Japanese invasion and later died in 1942.

After the war Professor Hou Pao-Chang held the Chair from 1948 to 1960. He had previously been Professor at Cheloo University and West China University and was well-respected within and outside China. His main research area was hepatobiliary disease and parasites. Professor Hou was succeeded first by Professor R. Kirk (another Glaswegian) in 1960 and then by Professor James Gibson in 1963. Professor Kirk had previously worked at the Stack Laboratories in Khartoum, Sudan and then accepted the post of Professor of Pathology at Singapore in 1955 before coming to Hong Kong. Professor Kirk made numerous contributions to medicine in the tropics and was remembered for his work on leishmaniasis. In 1962, a few months before his death his work on that disease was recognized by the Brazilian Government’s award of the Gaspar Vianna Medal. He frequently said “How could a Glasgow man help but work on leishmaniasis? You see, at the beginning there was Leishman”.

When Professor James Gibson took over after Robert Kirk’s death, one of his first achievements was the establishment of a separate Department of Microbiology in 1968. The Department still consisted of the disciplines of histopathology, cytology, haematology, clinical biochemistry and later immunology. Medical jurisprudence was also taught by part-time staff. In 1970 Professor Gibson helped negotiate an agreement between the University and the Hong Kong government resulting in a grant to run what became known as the ‘Hospital Pathology Service’ (HPS). This enabled the Department to provide a high quality pathology service to a modern teaching hospital of international standing. It also enabled the University to use its expertise to enhance the quality and scope of the clinical laboratory service.

Professor Gibson’s other achievements included the setting up of a central electron microscope unit in the University, a new Clinical Pathology Building adjacent to the old University Pathology Building in 1972, the setting up of a medical laboratory technician training programme on a territory-wide basis, the development of a cytology service, the setting up of an Immunology Section in 1975, and a tissue typing service in 1981, which now serves the whole of Hong Kong. He also oversaw the evolution of the Clinical Biochemistry Unit into a separate entity in 1982. While all this was going on he supervised the first students to obtain postgraduate research degrees in pathology at the University. The Department was also the organisational centre for a multicentre collaborative study of the classification of liver tumours sponsored by the WHO. This resulted in the publication of a WHO ‘blue book’ on the histological typing of tumours of the liver, biliary tract and pancreas. *

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Professor Kirk had previously worked in South Africa where he spent a year at the University of Witwatersrand before coming to the University of Khartoum where he had been awarded a Rockefeller Fellowship in 1946. In 1951 he returned to Scotland to take up a position as Reader in Pathology at the University of Edinburgh. He was appointed Professor of Pathology there in 1953. He was elected Fellow of the Royal Society of Edinburgh in 1947. Professor Kirk made numerous contributions to medicine in the tropics and was remembered for his work on leishmaniasis. In 1962, a few months before his death his work on that disease was recognized by the Brazilian Government's award of the Gaspar Vianna Medal. He frequently said "How could a Glasgow man help but work on leishmaniasis? You see, at the beginning there was Leishman".

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<td>Professor KHOO Ui-Soon</td>
<td>Breast Pathology</td>
<td>MBBCh BiD Int, MD HK, MMedSci(Path) Int, FRCP, FRHKCP, FRHKAM</td>
</tr>
<tr>
<td>Professor LAM Ching-Wan</td>
<td>Chemical Pathology and Genetics</td>
<td>MBChB, PhD, MAACB, FAACB, FRCP, FRHKCP, FRHKAM (Pathology), FFSc (RCPA), DABOT</td>
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<tr>
<td>Professor LEUNG Suet-Yi</td>
<td>Gastrointestinal Pathology</td>
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<td>Professor LAM Ching-Wan</td>
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<td>MBBSc HK, MD HK, PhD HK, FRCP, FRHKCP, FRHKAM (Pathology)</td>
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<tr>
<td>Professor John Malcolm NICOLLS</td>
<td>Paediatric Pathology</td>
<td>MBBSc HK, FRCP, FRHKCP, FRHKAM (Pathology)</td>
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<tr>
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<td>Forensic Pathology</td>
<td>MBBSc HK, DMU (Clin Path) Lond, CTLHE HK, FRHKCP, FRHKAM (Pathology)</td>
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<td>Renal Pathology</td>
<td>MBBSc HK, FRCP, FRHKCP, FRHKAM (Pathology)</td>
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<td>Dr HUANG Fang-Ping</td>
<td>Immunology</td>
<td>MB Shantou, MSc, MUX, PhD Giai</td>
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<tr>
<td>Dr IP Pun-Ching Philip</td>
<td>Gynaecological Pathology</td>
<td>MBChB (Hons), MBBSc, MMedSci (RCPA), FRCP, FRHKCP, FRHKAM (Pathology)</td>
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<tr>
<td>Dr SO Chi-Chiu Jason</td>
<td>Haematology</td>
<td>BSc (Hon), MBBSc, MMedSci (RCPA), FRCP, FRHKCP, FRHKAM (Pathology)</td>
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<td>Pulmonary Pathology</td>
<td>MBBSc HK, MD HK, FRHKAM (Pathology), FRHKCP</td>
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<td>Dr YAM Wai-Ping Judy</td>
<td>Molecular Cancer Biology</td>
<td>BSc Wash, MSc HKUST, PhD HK, FRHKCP, FRHKAM (Pathology)</td>
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<td>Translational Cancer Biology</td>
<td>BSc HKUST, MMed SC, MD HK, PhD HK, FRCP, FRHKAM (Pathology)</td>
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<td>Haematopathology</td>
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<td>BSc HK, PhD HK, FRCP, FRHKAM (Pathology)</td>
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</table>
# Academic Staff

## Professors

<table>
<thead>
<tr>
<th>Name</th>
<th>Specialty</th>
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<tbody>
<tr>
<td>Professor CHEUNG Nga-Yin Annie</td>
<td>Gynaecological Pathology</td>
<td>MBBS HK, MD HK, PhD HK, FRCPath, FHKAM (Pathology)</td>
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<tr>
<td>Professor KHOO Ui-Soon</td>
<td>Breast Pathology</td>
<td>MBCh BAO Int, MD HK, MMedSc(Pat) Int, FRCPath, FHKAM(Pat), MBAC, FHKAM(Pathology)</td>
</tr>
<tr>
<td>Professor LAM Ching-Wan</td>
<td>Chemical Pathology and Genetics</td>
<td>MBChB, PhD, MAAcB, FAACB, FRCPA, FRCPATH, FHKAM (Pathology), FFSc (RCPA), DABOT</td>
</tr>
<tr>
<td>Professor LEUNG Suet-Yi</td>
<td>Gastrointestinal Pathology</td>
<td>MBBS HK, MD, FHKAM (Pathology), FHKAPATH, FRCPATH (UK), FRCPA</td>
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<tr>
<td>Professor LU Liwei</td>
<td>Immunology</td>
<td>MBCh BAO Norman Bethune, PhD MCGW</td>
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<tr>
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<td>Hepatopathology</td>
<td>MBBS HK, MD HK, PhD HK, FRCPath, FRCPATH, FHKAM (Pathology)</td>
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<td>Paediatric Pathology</td>
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<td>MBBS Adel, FRCPATH, FHKAM (Pathology)</td>
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## Associate Professors

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<tbody>
<tr>
<td>Dr BEH Swan-Lip Phillip</td>
<td>Forensic Pathology</td>
<td>MBBS HK, DMU (Clin el Path) Lond, CIHLHE HK, FHKAPATH, FHKAM (Pathology)</td>
</tr>
<tr>
<td>Dr CHAN Kwok-Wah</td>
<td>Renal Pathology</td>
<td>MBBS HK, FRCPATH, FHKAPATH, FHKAM (Pathology)</td>
</tr>
<tr>
<td>Dr HUANG Fang-Ping</td>
<td>Immunology</td>
<td>MB Shantou, MSc, MUA, PhD Giss</td>
</tr>
<tr>
<td>Dr IP Pun-Ching Philip</td>
<td>Gynaecological Pathology</td>
<td>MBChB Giss, FRCPATH (UK), FHKAPATH, FHKAM (Pathology)</td>
</tr>
<tr>
<td>Dr SO Chi-Chiu Jason</td>
<td>Haematology</td>
<td>BSc Hon, MBBS, MDCOL, FFSc (RCPA), FRCPATH, FHKAPATH, FHKAM (Pathology)</td>
</tr>
<tr>
<td>Dr WONG Pik Maria</td>
<td>Pulmonary Pathology</td>
<td>MBBS HK, MD HK, FHKAM (Pathology), FHKAPATH</td>
</tr>
<tr>
<td>Dr YAM Wai-Ping Judy</td>
<td>Molecular Cancer Biology</td>
<td>BS Wash, MSc HKUST, PhD HKUST</td>
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## Assistant Professors

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<tbody>
<tr>
<td>Dr AU YEUNG Kwok-Him Rex</td>
<td>Malignant Lymphoma</td>
<td>MBBS HK, FRCPATH</td>
</tr>
<tr>
<td>Dr CHAN Sau-Fong Vera</td>
<td>Immunology and Autoimmunity</td>
<td>BSc (Hons) HK, DPhil Oxon</td>
</tr>
<tr>
<td>Dr LAW Chun-Yiu Eric</td>
<td>Chemical Pathology</td>
<td>BMedSc (Hons), MBChB, MAAcB, FRCPATH, FHKAM (Pathology)</td>
</tr>
<tr>
<td>Dr LEE Kin-Wah Terence</td>
<td>Translational Cancer Biology</td>
<td>BSc HKUST, MPhil HK, PhD HK</td>
</tr>
<tr>
<td>Dr LI Xiu-Ling, Vivian</td>
<td>Haematopathology</td>
<td>BMed Beijing, MMed Beijing, PhD HK</td>
</tr>
<tr>
<td>Dr LO Cheuk-Lam Regina</td>
<td>Hepatopathology</td>
<td>MBChb CMHK, FRCPATH, FHKAM (Pathology)</td>
</tr>
<tr>
<td>Dr WONG Chak-Lui Carmen</td>
<td>Cancer Metabolism and Tumor</td>
<td>BS HK, MSc HKUST, PhD HK</td>
</tr>
<tr>
<td>Dr WONG Chun-Ming Jack</td>
<td>Epigenetics</td>
<td>BS HK, MSc HKUST, PhD HK</td>
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## Research Assistant Professor

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RESEARCH INTERESTS

Studies on gynaecological cancers [cancers of ovary, endometrium and cervix; gestational trophoblastic disease]

• Genetic and epigenetic mechanisms in endometrial, ovarian and trophoblastic carcinogenesis

• Application of novel technical platforms including HPV assays in cervical cytology for cervical cancer screening

• Role of stem cells in gynaecological cancers

• PS3 related genes in gynaecological cancers

• Molecular signaling in gynaecological cancers

SELECTED PUBLICATIONS


**RESEARCH INTERESTS**

Studies on gynaecological cancers
- [cancers of ovary, endometrium and cervix; gestational trophoblastic diseases]
- **Genetic and epigenetic mechanisms in endometrial, ovarian and gestational trophoblastic cancers**
- Application of novel technical platforms including HPV assays in cervical cytology for cervical cancer screening.
- **Role of stem cells in gynaecological cancers**
- p53 related genes in gynaecological cancers
- Malignant signaling in gynaecological cancers

**SELECTED PUBLICATIONS**

**RESEARCH GRANTS**
- RGC - Competitive Earmarked Research Grants
  - *Fib1* (Pokinogen) in Gestational Trophoblastic Disease (2011)
  - SKY Seed Foundation
  - *HPV* detection as an adjunct for triage of atypical cervical cytology in screening for cervical cancer (2011)
  - Research Fund for the Control of Infectious Diseases & Health and Health Services Research Fund
  - Placental biology of Down Syndrome in relation to increased gene dosage (2013)
  - p53 related genes and gestational trophoblastic disease (2013)

**CLINICAL SERVICES**
- Pathologist in charge, Cervical Cytology Screening Laboratory, *The University of Hong Kong*
- Director (Molecular Pathology), University Pathology Laboratory, *The University of Hong Kong*
- Honorary Consultant, Queen Mary Hospital
- Chief of Service (Pathology), HKU-Shenzhen Hospital

**COMMUNITY SERVICES**
- President, Hong Kong College of Pathologists
- Council Member, Hong Kong Academy of Medicine

**AWARDS AND HONORS**
- Faculty Teaching Medal (2002)
- University Teaching Fellow (2005)
- Award for Innovative Excellence in Teaching, Learning & Technology in 17th International Conference on College Teaching and Learning (2006)
- 2011-12 Outstanding Research Student Supervisor Award (2013)
- Croucher Senior Medical Research Fellowship (2014)

**SELECTED PUBLICATIONS**

**RESEARCH INTERESTS**
- BRCA1 and BRCA2 genes - mutations in Chinese; epigenetics; functional variants
- Genetic association studies for breast cancer in Chinese
- Alternatively spliced variants in Chinese breast cancer
- Molecular biology studies on endocrine- and chemoresistance development in breast cancer

**EDUCATION**
- MBBS Your VIII - Chairman Coordinating Sub-committee
- Academic Director, Postgraduate Diploma in Molecular and Diagnostic Pathology

**COMMUNITY SERVICES**
- Executive Council member, International Academy of Cytology (2013-present)
- President, Hong Kong Society of Cytology (2009, 2010)
- Hon Treasurer, Hong Kong Museum of Medical Sciences (2008-2011)
- SK Ye Medical Foundation project to provide HER2 FIsh test for breast cancer patients requiring financial assistance

**RESEARCH GRANTS**
- Canadian Genetic Diseases Network Grant 2004
- Research Fund of the Control of Infectious Diseases 2004, 2005, 2006
- SK Ye Medical Foundation 2010, 2013
- Innovation and Technology Fund 2013

**AWARDS AND HONORS**
- Croucher Senior Research Fellowship Award (2015)
- Faculty Teaching Medal, The University of Hong Kong (2007)
- Vice-Chancellor Grant, The University of Hong Kong (1997)
- Mary Sun Fellowship in Oncology (1993)
RESEARCH INTERESTS
My research interests are focused on the molecular genetics and genomics of gastric and colorectal cancers. We have performed comprehensive molecular profiling and integrative genomic studies on large series of gastric and colorectal cancers using next-generation sequencing, expression microarray, DNA SNP genotyping array and methylation array. Our study revealed the complex genomic landscape of gastric cancer and first identified many novel cancer driver genes. Examples include frequent mutation of ARID1A, a chromatic remodeling gene, in gastric cancers with MSI or EBV, and hotspot mutation of PHDA in diffuse type gastric cancer. Integrative genomics analysis revealed molecular subtype-specific patterns of genetic and epigenetic perturbations, many of them converging to target the same key cancer driver genes or pathways.

SELECTED PUBLICATIONS
Our team has extensively characterized the genetic basis of early-onset colorectal cancer (CRC) in Hong Kong and revealed a common founder mutation in the EPCAM gene of our Chinese population. We have described the first example of heritable germline methylation of MSH2 gene promoter as a cause of hereditary colon cancer, and uncovered a novel mechanism of methylation induction and gene silencing through abrogation of transcriptional termination signal in an upstream neighbouring gene named EPCAM (TACSTD1). These findings have resulted in incorporation of EPCAM deletion into the standard genetic diagnosis protocol for Lynch Syndrome worldwide. We now apply the research findings to patient care, by providing a charitable genetic diagnosis service including genetic testing and referral for prophylactic screening for early-onset or familial colorectal carcinoma patients. We have studied in depth the role of the BRAF mutation in CRCs, and discovered an interesting relationship between the BRAF mutation and various pathways of colorectal carcinogenesis. The long term goal of our laboratory is to utilize genomics technology to identify novel pathways of carcinogenesis and hereditary predisposition for colorectal and gastric cancers, and to identify biomarkers for early patient stratification, prognostication or drug targets.

SELECTED PUBLICATIONS
Lympocyte development and its dysregulation in immune disease

LU Liwei

Professor of Immunology

RESEARCH INTERESTS
My research has been focusing on lymphocyte development and its dysregulation in autoimmune diseases. Studies in normal and mutant mice have allowed us to examine lymphocyte apoptosis and its role in maintaining quality control and homeostasis in the immune system. We are also interested in studying the dysregulated cytokine production and lymphocyte function during the pathogenesis of autoimmune disorders. Using an animal model for human rheumatoid arthritis, we are developing novel strategies for targeting TNF family cytokines in treating autoimmune arthritis. Further knowledge of the regulatory mechanisms underlying lymphocyte development and function should shed light on the prophylaxis and therapy of immune disease.

SELECTED PUBLICATIONS

RESEARCH GRANTS
• Roles of lpltin in regulating B cell function. RGC CERG
• Plasma cell and its regulation in autoimmunity. RGC CERG
• Natural killer cells and autoimmunity. RGC CERG
• B cell apoptosis and its regulation in autoimmunity. RGC CERG
• Innovative development of a gene-targeted therapy for rheumatoid arthritis. Innovation and Technology Support Programme
• Regulation of dendritic cell function and its therapeutic application in autoimmune diabetes. NSF/ERC
• Roles of antigen-presenting cells immune response and tolerance. National Key Basic Research Program of China

AWARDS AND HONORS
• Director (2015), Federation of Immunological Societies of Asia-Oceania
• Chairman (2014), Hong Kong Society for Immunology
• Outstanding Researcher Award (2013), The University of Hong Kong
• Croucher Senior Research Fellowship Award (2012), Croucher Foundation
• Medical Faculty Teaching Medal (2008), The University of Hong Kong
• Young Investigator Award (2003), Hong Kong Society for Immunology
• David Rae Memorial Award (2000), Leukemia Research Fund of Canada

My research work focuses on the molecular basis in the formation and progression of liver cancer, identification and characterization of important genes, cell signaling pathways, and liver cancer stem cells. My laboratory looks into the major oncogenic signaling pathways in liver cancer, including DQC1/Rho/ROCK, Wnt/β-catenin, and PTEN/Akt/mTOR, and investigating the cooperation and crosstalk in liver cancer, including DLC1/Rho/ROCK, Wnt/β-catenin, and PTEN/Akt/mTOR. My laboratory also investigates the molecular mechanisms leading to liver cancer metastasis and its regulation of liver cancer stem cells. My laboratory looks into the major oncogenic signaling pathways in liver cancer, including DQC1/Rho/ROCK, Wnt/β-catenin, and PTEN/Akt/mTOR.

SELECTED PUBLICATIONS
3. Sze KMF, Chu GKY, Ng IO. C-terminal truncated HBx is associated with metastasis and enhances invasiveness via C-Jun/MMP10 activation in hepatocellular carcinoma. Hepatology 2013, 57:131-141.

RESEARCH INTERESTS
Liver cancer - molecular genetics and cell signaling:
• Molecular mechanisms in pathogenesis and metastasis
• Delineation of important cell signaling pathways
• Liver cancer stem cells
• Tumor microenvironment

RESEARCH GRANTS
• (as PI and in the recent 5 years)
  • Health and Medical Research Fund on HBV and liver cancer (2013)
  • Innovation & Technology Fund on Liver cancer (2011)
  • SK Yee Medical Research Fund on Liver cancer (2012)

AWARDS AND HONORS
• The World Academy of Science 2014 prize (Medical Science)
• Director, State Key Laboratory for Liver Research
• Loke Yew Endowed Professorship in Pathology
• Croucher Senior Medical Research Fellowship 2013-14 & 2005-06
• Director, Croucher Summer Course in Cancer Biology 2013, 2015 & 2017
• Faculty Outstanding Researcher Award 2012, HKU
• Outstanding Researcher Student Supervisor Award 2007, HKU
• Outstanding Researcher Award 2005, HKU
Lymphocyte development and its dysregulation in immune disease

LU Liwei

Professor of Immunology

DEPARTMENT OF PATHOLOGY

RESEARCH INTERESTS

My research has been focusing on lymphocyte development and its dysregulation in autoimmune diseases. Studies in normal and mutant mice have allowed to examine lymphocyte apoptosis and its role in maintaining quality control and homoeostasis in the immune system. We are also interested in studying the dysregulated cytokine production and lymphocyte function during the pathogenesis of autoimmune disorders. Using an animal model for human rheumatoid arthritis, we are developing novel strategies for targeting Th17 family cytokines in treating autoimmune arthritis. Further knowledge of the regulatory mechanisms underlying lymphocyte development and function should shed light on this prophylaxis and therapy of immune disease.

SELECTED PUBLICATIONS


RESEARCH GRANTS

- Role of laptin in regulating B cell function. RGC CERG
- Plasma cell and its regulation in autoimmune. RGC CERG
- Natural killer cells and autoimmunity. RGC CERG
- B cell apoptosis and its regulation in autoimmune. RGC CERG
- Innovative development of a gene-targeted therapy for rheumatoid arthritis. Innovation and Technology Support Programme
- Regulation of dendritic cell function and its therapeutic application in autoimmune diabetes. NSFC/ERC
- Role of antigen-presenting cells in immune response and tolerance. National Key Basic Research Program of China

STUDIES ON IMMUNOPATHOGENESIS AND THERAPEUTIC INTERVENTION OF RHEUMATOID ARTHRITIS. National Key Basic Research Program of China

RESEARCH INTERESTS

Liver cancer - molecular genetics and cell signaling: Molecular mechanisms in pathogenesis and metastasis
- Delineation of important cell signaling pathways
- Liver cancer stem cells
- Tumor microenvironment

AWARDS AND HONORS

- Chairperson (2015), Federation of Immunological Societies of Asia-Oceania
- Chairman (2014), Hong Kong Society for Immunology
- Outstanding Researcher Award (2013), The University of Hong Kong
- Croucher Senior Research Fellowship Award (2012), Croucher Foundation
- Medical Faculty Teaching Medal (2008), The University of Hong Kong
- Young Investigator Award (2003), Hong Kong Society for Immunology
- David Rae Memorial Award (2000), Leukemia Research Fund of Canada

My research work focuses on the molecular basis in the formation and progression of liver cancer, identification and characterization of important genes, cell signaling pathways, and liver cancer stem cells. My laboratory looks into the major oncogenic signaling pathways in liver cancer and their co-operation and crosstalk. We are currently characterizing critical oncogenic signaling pathways in liver cancer, including DLL1/Pro/ROCK, Wnt/Ca+ and PTEN/PI3K/AKT, and investigating the cooperation and crosstalk of these pathways with other critical genes and pathways. We are also investigating the molecular mechanisms leading to liver cancer metastasis. We aim to identify the key molecules that govern cancer cell motility and invasion of cancer cells and the tumor microenvironment that enhances metastasis. We are using next-generation sequencing to look for novel liver cancer-related genes involved in the disease’s development, biological mechanism and metastasis.

SELECTION PUBLICATIONS


RESEARCH GRANTS

- (as PI and in the recent 5 years) RGC Collaborative Research Fund on Liver cancer (2010)
- Health and Medical Research Fund on HBV and Liver cancer (2013)
- Innovation & Technology Fund on liver cancer (2011)
- SK Yee Medical Research Fund on liver cancer (2012)

AWARDS AND HONORS

- World Academy of Science 2014 prize (Medical Science)
- Director, State Key Laboratory for Liver Research
- Loke Yew Endowed Professorship in Pathology
- Croucher Senior Medical Research Fellowship 2013-14 & 2005-06
- Director, Croucher Summer Course in Cancer Biology (2013, 2015 & 2017)
- Faculty Outstanding Research Award 2012, HKU
- Outstanding Research Student Supervisor Award 2007, HKU
- Outstanding Researcher Award 2005, HKU
How do viruses interact with cells? What can we do to enhance student learning?

Department of Pathology
Nicholas John Mallick

Clinical Professor

Email: nicholas.mallick@hku.hk

RESEARCH INTERESTS

Viruses are involved in a number of infectious and neoplastic diseases of the respiratory tract in humans. I have been investigating what role the Epstein-Barr virus plays in nasopharyngeal carcinoma (NPC), and in particular two of the virus proteins (LMP1 and BARF1) which have been implicated in the development of NPC. In particular I have been looking at whether there is “good” or “bad” LMP or BARF1 and how these proteins differ in NPCs from different geographical regions. This work involves collaboration with EBV experts from Europe and North America. I have also collaborated with researchers from the Queensland Institute of Medical Research to explore the expression of these viral proteins using a novel CTL-based immunotherapy approach for NPC patients which has finished a Phase I clinical trial and is now in Phase II clinical trial.

In addition I have worked closely with colleagues from the School of Public Health in investigating why certain new and emerging viruses such as SARS and H5N1 appear to be so lethal in humans. It is because they are attacking cells which are not normally attacked by viruses? Is it because they are triggering cells to release too many cytokines, or is it because they are interacting with cell receptors which are not normally expressed in normal conditions? Whatever the result, the main aim of my research is to put a clinical perspective on reducing the damage caused by viruses in the human and investigating what factors determine which cells may be bound by particular influenza viruses.

SELECTED PUBLICATIONS


SELECTED PUBLICATIONS


AWARDS AND HONORS

• University Teaching Fellowship 1997-1998
• Croucher Senior Medical Fellowship 2009-2010
• Teaching Research Output Award 2008

RESEARCH INTERESTS

Current research has focused on the development and maintenance of a Hong Kong Homicide Monitoring Database. The data collected in this ongoing project is proving to be important for research into the many different types of homicides. A successful example of its utilization has been the study report on Homicide-Suicide in Hong Kong. A comprehensive description and analysis of the many aspects of the tragic circumstances that lead to homicide-suicides in Hong Kong. Other examples include a study that associates injuries on victims of homicides with the victim-offender relationship and post-killing behavior of offenders correlated their relationship with the victim and other offender attributes. Studies into many other areas are on-going. The other area of expertise and study has been the issues surrounding sexual assaults in Hong Kong. Studies on prevalence, and victim and offender characteristics have been published, as well as a recent study on attrition rates. Continuous advocacy for the improvement of services to these victims and studies to fill gaps in current knowledge are being pursued.

An emerging area of interest is that of exploring the reasons for a decline in autopsies; even in medicolegal cases. Attempts are made to explore the attitudes of the key players: Coroner, pathologists, police officers, next-of-kin as well as those of the general public and assessing their impact on the likelihood of an autopsy.

Cooperation with colleagues in the HK Jockey Club Centre for Research and Prevention of Suicides have led to some publications looking at the impact of suicide on survivors and the identification of needs for bereavement services for survivors of suicides as well as for those of other forms of sudden deaths. Forensic pathology and clinical forensic medicine is a rich field for applied research and continuous efforts are made to collaborate with and support colleagues with a common interest.

SELECTED PUBLICATIONS


2. Chan ACK, Beh PSL and Broadhurst RG. To Flee or Not: Predicting Responses Among Intimate Partner Homicides in Hong Kong. Homicide Studies 2010, 14(4):400-419.


5. Wong PWC, Chan WSC and Beh SL. What can we do to help and understand survivors of suicide in Hong Kong? Crisis 2007, 28.


10. Book Chapters in:

AWARDS AND HONORS

• Member of Editorial Board of Forensic Science International 2011-13
• Member of International Editorial Board Medicine & Science 2009-2010
• Member of Scientific Advisory Committee. International Academy of Legal Medicine 2009-2011
• President Hong Kong Forensic Science Society 2009-2010
• President – World Police Medical Officers 2005-2008
• President – Forensic Science Society Hong Kong 2006-2008
• Chief Examiner (Forensic Pathology) – Hong Kong College of Pathologists 2006-2010
• Vice-President – International Association of Forensic Sciences 2002-2005
• Faculty Teaching Medal – Faculty of Medicine, HKU 2003
• SEDA Accredited Teacher in Higher Education
• Co-Investigator in RGC Grant on Homicides in Three Chinese Cities
• Co-Investigator in Lotteries Fund Study Grant on Homicide-Suicide in Hong Kong
• Associate Editor, Journal of Clinical Forensic Medicine
• Editorial Advisory Board Member, Encyclopedia of Forensic and Medical (Elsevier) 2005
SELECTED PUBLICATIONS


SELECTED PUBLICATIONS


RESEARCH INTERESTS

1. Immune regulation in systemic autoimmune & inflammatory disorders

RESEARCH GRANTS

2. Arthritis Research UK: ARUK (PI) 2009
3. The State Key Laboratory for Liver Research (SKLLR) Fund (PI) 2014
4. The Tairjan Government Visiting Research Fellow Scheme (PI): 2012
5. The Perenne - Great Wall Visiting Research Fellow Scheme (PI): 2011
6. The Cheng Yu Tung Research Fund - Visiting Research Fellow Scheme (F): 2008

AWARDS AND HONORS

1. Li Ka Shing Academy Foundation Fellowship (1997-98), Shanghai, China
2. Macfarlan Peed PhD Scholarship, University of Glasgow (1988 - 93, Glasgow)
7. Imperial College Research Excellence Award (Team member: 2009, London)
8. European Journal of Immunology (Editorial Board Member, 2007; - 2010)
9. The Open Autoimmunity Journal (Editorial Board Member, 2008 - Current)
10. Clinical & Developmental Immunology (Guest Editor, 2009 - 2010)
Pathology and molecular mechanisms of uterine and ovarian cancers

Email: philipip@hku.hk
Clinical Associate Professor

DEPARTMENT OF PATHOLOGY

RESEARCH INTERESTS

- Studying the molecular mechanisms of the development and progression of premalignant and malignant uterine and ovarian tumors, and searching for biomarkers relevant to diagnosis, treatment and prognosis.
- Studying of uterine mesenchymal tumors and molecular genetics of ovarian cancers, in collaboration with Department of Obstetrics and Gynaecology, The University of Hong Kong, and major research centres in The United States, United Kingdom and Singapore.

SELECTED PUBLICATIONS


DEPARTMENT OF PATHOLOGY
SELECTED PUBLICATIONS


5. Ip PP, Tsai KY, Tam KF. Uterine smooth muscle tumors other than the ordinary leiomyomas and leiomyosarcomas: A review of selected variants with emphasis on recent advances and unusual morphology that may cause concern for malignancy. *Adv Anat Pathol* 2010, 17:91-112.


EDITORSHIP

- *Acta Cytologica*

RESEARCH INTERESTS

I am interested in diagnostic haematopathology including phenotypic and genetic analysis of inherited and malignant blood disorders. My current research interests are on genetics of thalassaemia and its phenotypic modulation, and genetic basis of other inherited blood disorders.

SELECTED PUBLICATIONS


2. So CC, Chan HY, Chan JC, Ma ES. Alpha thalassaemia trait masquerading as hemoglobin H disease due to co-existing primary myelofibrosis. *Ann Hematol* 2015, 94:875-877.


My research focuses on the molecular genetics and carcinogenic mechanisms of human lung cancers. Women in Hong Kong have unusually high lung cancer incidence and mortality rates despite that most are non-smokers. The mechanisms underlying this unusual epidemiology are not fully understood and lung cancer treatment remains a challenge. Our research aims to achieve a better understanding of lung cancer biology, improve diagnosis, prognostication and contribute to therapy.

- **Cancer genomics** - We have previously used direct sequencing to profile a panel of lung oncogenes (Fig. 1). We observed somatic EGFR mutations in >70% of non-smokers and 20% of smokers. The EGFR mutation profile is complex; different treatment responses to tyrosine kinase inhibitors (TKI) are observed in different mutation types. The ALK translocation frequency is 5%, which, apart from EML4, includes novel fusion partners such as KIF5B. Currently, we are using next generation sequencing to investigate the whole exome sequencing (WES) profiles of clinical lung cancer samples and their relations with TKI response patterns, intratumoral genetic heterogeneity and clinicopathological features in patients. We are also collaborating with international bioinformatics teams to uncover novel patterns of genomic aberrations in lung cancers, especially those from non-smokers.

- **Cancer susceptibility loci** - We are members of the Femal Lung Cancer Consortium in Asia (FLCCA) coordinated by the National Cancer Institute, USA, which conducts multiple large scale international projects to identify lung cancer susceptibility loci and their relation with environmental factors. The next project aims to study WES profiles of lung adenocarcinomas from female non-smokers and their correlation with genomic susceptibility loci in order to identify biomarkers for cancer prediction and genetic screening.

- **Lung cancer biology** - Cancer initiating cells (TIC) are believed to embrace superior tumorigenic and drug resistant properties but their existence and identity remain elusive. We demonstrated cancer cells with ALDH\(^+\)/CD44\(^+\) expression have TIC-like properties (Fig. 2). Over-expression of calcium signaling pathways which are coupled to plasmid proteins are observed and further investigations of their roles in lung cancer biology are being conducted.

**SELECTED PUBLICATIONS**


**SELECTED PUBLICATIONS**


**RESEARCH GRANTS**

- **Health and Medical Research Fund** (2013, 2014)

**AWARDS AND HONORS**

- Outstanding Young Researcher Award 2010, HKU
DEPARTMENT OF PATHOLOGY

DEPARTMENT OF PATHOLOGY

Pathology and molecular genetics of lung cancer

Wong Pik Maria

MDSc BS, MD, PhD, FHKAM (Pathology), FHKP(CPath)

Email: mpik@hku.hk

Clinical Associate Professor

RESEARCH INTERESTS

My research focuses on the molecular genetics and carcinogenic mechanisms of human lung cancers. Women in Hong Kong have unusually high lung cancer incidence and mortality rates despite that most are non-smokers. The mechanisms for this unusual epidemiology are not fully understood and lung cancer treatment remains a challenge. Our research aims to achieve a better understanding of lung cancer biology, improve diagnosis, prognostication and contribute to therapy.

- **Cancer genomics** - We have previously used direct sequencing to profile a panel of lung oncogenes (Fig. 1). We observed somatic EGFR mutations in >70% of non-smokers and 20% of smokers. The EGFR mutation profile is complex; different treatment responses to tyrosine kinase inhibitors (TKI) are observed in different mutation types. The ALK translocation frequency is 5%, which, apart from EML4, includes novel fusion partners such as KIF5B. Currently, we are using next generation sequencing to investigate the whole exome sequencing (WES) profiles of clinical lung cancer samples and their responses with TKI response patterns, intratumoral genetic heterogeneity and clinicopathological features in patients. We are also collaborating with local and international bioinformatics teams to uncover novel patterns of genomic aberrations in lung cancers, especially those from non-smokers.

- **Cancer susceptibility loci** - We are members of the Familial Lung Cancer Consortium in Asia (FLCCA) coordinated by the National Cancer Institute, USA, which conducts multiple large scale international projects to identify lung cancer susceptibility loci and their relation with environmental factors. The next project aims to study WES profiles of lung adenocarcinomas from female non-smokers and their correlation with genomic susceptibility loci in order to identify biomarkers for cancer prediction and genetic screening.

- **Lung cancer biology** - Cancer initiating cells (TICs) are believed to embrace superior tumorigenic and drug resistant properties but their existence and identity remain elusive. We demonstrated cancer cells with ALDH^+^CD44^+^ expression have TIC-like properties (Fig. 2). Over-expression of calcium signaling pathways which are coupled to pleiotropic proteins are observed and further investigations of their roles in lung cancer biology are being conducted.

SELECTED PUBLICATIONS


8. Wong D, Leung EL, So RK, Tam IY, Shioe AD, Chung LC, Ho KK, Au JS, Chung LP and Wong MP. The EML4-ALK fusion gene is involved in various histologic types of lung cancers from nonsmokers with wild-type EGFR and KRAS. Cancer 2009, 115(8):1723-1733.


DEPARTMENT OF PATHOLOGY

DEPARTMENT OF PATHOLOGY

Molecular biology in human cancers

Wong Wai-Ping Judy

Bachelor of Medicine, Bachelor of Surgery, Master of Medicine, Master of Medical Science, Associate Professor

Email: judywong@pathology.hku.hk

RESEARCH INTERESTS

Our research interest focuses on the characterization of tumor suppressors and oncogenes and elucidation of associated cellular signaling pathways which contribute to lung cancers tumorigenesis and metastasis. We have particular interest in nuclear adhesion proteins which form structural links between extracellular matrix and actin cytoskeleton, and are important sites of signal transduction. A number of diverse focal contact proteins are interconnected at the focal adhesions. Dysregulation of focal adhesion proteins has been implicated in various cancers and contributed to the acquired metastatic behavior of cancer cells. We believe a better understanding of the functional effects of focal adhesion proteins in the aggressive phenotypes of cancer cells will have profound implications for the diagnosis and therapeutic interventions for lung cancer.

SELECTED PUBLICATIONS


3. Ko FCP, Leung TW, Tam IY, Leung EL, Tin VP, Chung LP and Wong MP. p53 is an oncogene in lung cancer and has been implicated in various cancers and contributed to the acquired metastatic behavior of cancer cells. We believe a better understanding of the functional effects of focal adhesion proteins in the aggressive phenotypes of cancer cells will have profound implications for the diagnosis and therapeutic interventions for lung cancer.

AWARDS AND HONORS

Outstanding Young Researcher Award 2010, HKU

RESEARCH GRANTS

- Health and Medical Research Fund (2013, 2014)
RESEARCH INTERESTS
• Molecular pathogenesis of malignant lymphoma

SELECTED PUBLICATIONS

RESEARCH GRANTS
• Seed Funding Programme for Basic Research (2015) (Principal investigator)

RESEARCH INTERESTS
My previous research was to utilize zebrafish as a model to study the development of haematopoietic stem/progenitor cells. My future research will focus on establishing animal models for haematological malignancies and deciphering relevant gene regulation programme.

SELECTED PUBLICATIONS

AWARDS AND HONORS
• The Croucher Foundation Fellowship (1998-2000)
• The Edward Jenner Institute for Vaccine Research (UK) Studentship (1997)
• The Croucher Foundation Scholarship (1994-1997)
• The Hong Kong-Oxford Scholarship Fund Bursaries for Postgraduate (1993)

RESEARCH GRANTS
• RGC-General Research Fund (2013, co-investigator)
• RGC-General Research Fund (2011, PI)
• Seed Funding for Basic Research (2011, 2012, 2014, PI)
• Hammersmith Hospital Trustees’ Research Committee Grant, UK (2008, PI)

RESEARCH INTERESTS
• Immune receptors immunobiology: understanding the interactions of C-type lectin receptors and Toll-like receptors and their roles in autoimmunity and infection
• Mechanistic studies on cellular immuno-dysregulation in systemic lupus erythematosus
• Development of humanized-mouse models for autoimmune diseases pathogenesis study and for testing new therapeutics
• Development of immuno-therapeutics for treatment of SLE

SELECTED PUBLICATIONS

AWARDS AND HONORS
• The Croucher Foundation Fellowship (1998-2000)
• The Edward Jenner Institute for Vaccine Research (UK) Studentship (1997)
• The Croucher Foundation Scholarship (1994-1997)
• The Hong Kong-Oxford Scholarship Fund Bursaries for Postgraduate (1993)
RESEARCH INTERESTS

**Malignant lymphoma**

**AU YEUNG Kwok-Him Rex**

Clinical Assistant Professor

**HAEMATOPOIETHY**

**LI Xiu-Ling Vivian**

Clinical Assistant Professor

**RESEARCH INTERESTS**

• Molecular pathogenesis of malignant lymphoma

**SELECTED PUBLICATIONS**


**RESEARCH INTERESTS**

My previous research was to utilize zebrafish as a model to study the development of haematopoietic stem/progenitor cells. My future research will focus on establishing animal models for haematological malignancies and deciphering relevant gene regulation programme.

**SELECTED PUBLICATIONS**


**RESEARCH INTERESTS**

• Immune receptors immunobiology: understanding the interactions of C-type lectin receptors and Toll-like receptors and their roles in autoimmunity and infection

• Mechanistic studies on cellular immuno-dysregulation in systemic lupus erythematosus

• Development of humanized-mouse models for autoimmune diseases pathogenesis study and for testing new therapeutics

• Development of immuno-therapeutics for treatment of SLE

**SELECTED PUBLICATIONS**


**RESEARCH INTERESTS**

• Immune receptors immunobiology: understanding the interactions of C-type lectin receptors and Toll-like receptors and their roles in autoimmunity and infection

• Mechanistic studies on cellular immuno-dysregulation in systemic lupus erythematosus

• Development of humanized-mouse models for autoimmune diseases pathogenesis study and for testing new therapeutics

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**SELECTED PUBLICATIONS**


**RESEARCH INTERESTS**

• Immune receptors immunobiology: understanding the interactions of C-type lectin receptors and Toll-like receptors and their roles in autoimmunity and infection

• Mechanistic studies on cellular immuno-dysregulation in systemic lupus erythematosus

• Development of humanized-mouse models for autoimmune diseases pathogenesis study and for testing new therapeutics

• Development of immuno-therapeutics for treatment of SLE

**SELECTED PUBLICATIONS**

RESEARCH INTERESTS
Clinical metabolomics and advanced laboratory medicine.

SELECTED PUBLICATIONS

SELECTED AWARDS AND HONORS
• Winner of Roche Scientific Display: Chemical Pathology (Co-author) in Pathology Update 2015, The Royal College of Pathologists in Australasia. Title of the poster presentation: “A metabolomic approach for biomarker discovery for diagnosis of malignant pleural effusions.”
• Board of Education and Assessment Poster Prize (runner up) at Pathology Update 2015 (Melbourne), The Royal College of Pathologists of Australasia.”

PRIZE
• Springinger Prize for outstanding poster presentation of research in the field of metabolomics in the Metabolomics Society 2013 Conference (Glasgow), The Metabolomics Society

RESEARCH GRANTS
• Seed Funding Programme for Basic Research (2015)
• National Natural Science Foundation of China (NSFC) (2015, Co-I)

SELECTED PUBLICATIONS

RESEARCH INTERESTS
• Molecular mechanism of HCC development and metastasis
• Therapeutic targeting of liver cancer stem cells
• Dissecting the cellular factors in tumor microenvironment

AWARDS AND HONORS
• Faculty Outstanding Research Output Award, Faculty of Medicine, HKU (2012)
• Faculty Outstanding Research Output Award, Faculty of Medicine, HKU (2011)
• Young Researcher Career Development Scheme (YRDCS), State Key Laboratory for Liver Research (2011)
• Hong Kong Young Scientist Award (J&b Sciences), Hong Kong Institution of Science (2006)

EDITORSHIP
• PLoS One
• Journal of American Stem Cell Research
• Journal of Liver Disease and Transplantation
• Austin Journal of Clinical Pathology
• International Journal of Cancer and Clinical Research

RESEARCH GRANTS
• NSFC - General Research Fund (2011, 2013, 2014) (PI)
• Hong Kong General Research Fund (2013) (PI)
• ITF - Innovation Technology Fund (2012, 2013, 2014) (Co-I)
• RGC - General Research Fund (2013) (PI)
• CRF - Collaborative Research Fund (2009) (Co-I)

AWARDS AND HONORS
• Young Researcher Career Development Scheme (YRDCS), State Key Laboratory for Liver Research (2011)
• Hong Kong Young Scientist Award (J&b Sciences), Hong Kong Institution of Science (2006)
**SELECTED PUBLICATIONS**


**SELECTED PUBLICATIONS**

2. Lau EY, Ng IO, Lee TK. Cancer associated fibroblasts and hepatocellular carcinoma. *J Liver Dis & Transplant* 2012, 1.2.

**RESEARCH GRANTS**

- Seed Funding Programme for Basic Research (2015)

**RESEARCH INTERESTS**

- Molecular mechanisms of HCC development and metastasis
- Therapeutic targeting of liver cancer stem cells
- Dissecting the cellular factors in tumor microenvironment

**SELECTIONS**

Molecular pathogenesis of liver cancer

Lo Cheuk-Lam Regina
Assistant Professor
Email: reginalo@pathology.hku.hk

Clinical Assistant Professor

RESEARCH INTERESTS

Identification of key functional molecular targets in liver cancer; Liver transplant pathology

SELECTED PUBLICATIONS


AWARDS AND HONORS

• Distinguished Young Fellow, Hong Kong Academy of Medicine, 2015
• Junior Investigator Award, The International Liver Cancer Association 9th Annual Conference, 2015

RESEARCH INTERESTS

Hepatocellular carcinoma (HCC) is the most common type of primary liver cancer. It is the fifth most common cancer in the world and the second leading cause of cancer death. High mortality rate in HCC is mainly due to late symptom presentation and lack of curative therapy. Therefore, understanding the molecular biology of HCC is warranted for the development of better diagnostic platforms and therapeutic regimens. Our research focuses on two emerging and fundamental aspects in HCC: (1) Tumor microenvironment in HCC; Solid tumors, in addition to malignant cells, are made up of other non-malignant cell types (stromal cells). Solid tumors are embedded in a remodeled extracellular matrix (ECM). Solid tumors are constantly experiencing inflammation and temporal changes of oxygen tension. These cellular and non-cellular components provide a unique tumor microenvironment conferring malignant cells oncogenic and metastatic properties. Our research focuses on the molecular mechanisms involved in the formation of tumor microenvironment in HCC. Currently, we are investigating the clinical implications, regulations, and roles of hypoxia (oxygen deprivation) in ECM modification in HCC. We are also investigating the roles of hypoxia in stromal cell-cancer cell interaction. (2) Metabolic reprogramming in HCC; The major difference between cancer cells and normal cells is that cancer cells grow uncontrollably. Unlike normal differentiated cells which utilize mitochondrial oxidative phosphorylation to produce energy, cancer cells metabolize glucose by aerobic glycolysis, a phenomenon called the “Warburg Effect”. Although aerobic glycolysis is an energy inefficient process, it advantages cancer cells to divert glucose intermediates for anabolic reactions and anti-apoptotic production. Liver has many unique metabolic functions including gluconeogenesis, glycogen synthesis and storage, and blood glucose homeostasis. However, how the metabolic machineries are reprogrammed during the formation of HCC is largely unknown. Our group is investigating the signaling pathways that rewire the metabolic programs in HCC. We are also exploring the novel functions of metabolic enzymes and the therapeutic potential of drugs that target the metabolic machinery of HCC.

SELECTED PUBLICATIONS


RESEARCH GRANTS

• Research Grant Council General Research Fund 2015 (PI)
• Research Grant Council General Research Fund 2014 (PI)
• Research Grant Council General Research Fund 2013 (PI)
• Health and Medical Research Council 2014 (PI)
• Health and Medical Research Council 2013 (PI)

AWARDS AND HONORS

• Young Researcher Career Development Schwarcz 2014
• Croucher Foundation Fellowship 2009-2011
• Li Ka Shing Prize 2009
• Dr. Ka Shing Chang Gold Medal 2009
• Hong Kong Young Scientist Award 2009
RESEARCH INTERESTS
Identification of key functional molecular targets in liver cancer; Liver transplant pathology.

SELECTED PUBLICATIONS


AWARDS AND HONORS
- Distinguished Young Fellow, Hong Kong Academy of Medicine, 2015
- Junior Investigator Award, The International Liver Cancer Association 9th Annual Conference, 2015

RESEARCH INTERESTS
Hepatocellular carcinoma (HCC) is the most common type of primary liver cancer. It is the fifth most common cancer in the world and the second leading cause of cancer deaths. High mortality rate in HCC is mainly due to late symptom presentation and lack of curative therapy. Therefore, elucidation of the molecular biology of HCC is warranted for the development of better diagnostic platforms and therapeutic regimens. Our research focuses on two emerging and fundamental aspects in HCC.

1. Tumor microenvironment in HCC: Solid tumors, in addition to malignant cells, are made up of other non-malignant cell types (stromal cells). Solid tumors are embedded in a remodeled extracellular matrix (ECM). Solid tumors are constantly experiencing inflammation and temporal changes of oxygen tension. These cellular and non-cellular components provide a unique tumor microenvironment contributing malignant cells oncogenic and metastatic properties. Our research focuses on the molecular mechanisms involved in the formation of tumor microenvironment in HCC. Currently, we are investigating the clinical implications, regulations, and roles of hypoxia (oxygen deprivation) in ECM modification in HCC. We are also investigating the roles of hypoxia in stromal cell-cancer cell interaction.

2. Metabolic reprogramming in HCC: The major difference between cancer cell and normal cell is that cancer cell growth is uncontrollable. Unlike normal differentiated cells which utilize mitochondrial oxidative phosphorylation to produce energy, cancer cells metabolize glucose by aerobic glycolysis, a phenomenon called the “Warburg Effect.” Although aerobic glycolysis is an energy-inefficient process, it advantages cancer cells to divert glucose intermediates for anabolic reactions and anti-oxidant production. Liver has many unique metabolic machineries that rewire the metabolic programs in HCC. Therefore, knowledge on the molecular biology of HCC is warranted for the development of better diagnostic platforms and therapeutic regimens.

SELECTED PUBLICATIONS


Awards and Honors
- Young Researcher Career Development Scholarship 2014
- Young Researcher Career Development Scholarship 2014
- Research Grant Council General Research Fund 2013 (PI)
- Health and Medical Research Council 2014 (PI)
- Health and Medical Research Council 2013 (PI)
- Discovery Grant Council General Research Fund 2015 (PI)
- Health and Medical Research Council 2014 (PI)
- Young Researcher Career Development Scholarship 2014
- Croucher Foundation Fellowship 2009-2011
- Dr. KP Stephen Chang Gold Medal 2009
- Young Hong Kong Scientist Award 2009
1. SELECTED PUBLICATIONS

Metastasis. We believe that a better knowledge of the underlying lncRNA regulatory circuit implicated in liver cancer progression and particularly focus on delineating the interplay between long-coding roles in liver cancer development and metastasis. Our recent studies alterations and molecular functions of non-coding RNAs and their epigenetic alterations play a crucial role in silencing tumor gene expression pattern. We and others have previously shown that epigenetic alterations a crucial role in silencing tumor suppressor genes in human cancers. We are also interested to study the expression profiles, epigenetic alterations and molecular functions of non-coding RNAs and their roles in liver cancer development and metastasis. Our recent studies particularly focus on delineating the interplay between long-coding RNA and epigenetic machinery and how deregulation of epigenetic circuity implicated in liver cancer progression and metastasis. We believe that a better knowledge of the underlying molecular mechanisms of hepatocarcinogenesis and cancer metastasis is of crucial importance for the development of new diagnostic tools and therapeutic interventions for this lethal cancer.

2. Tsang PH, Au SL, Fan DH, Lee JM, Wong CC, Ng IO #. Wong CM #. HOTTIP, an oncogenic long non-coding RNA, is frequently up-regulated in hepatocellular carcinoma and is negatively regulated by tumor suppressive microRNA miR-125b. *Liver Int* 2015, 35:1597 (# Corresponding authors).


**RESEARCH INTERESTS**

- Genetic and epigenetic alterations in liver cancer
- Non-coding RNA deregulation in liver cancer
- Mechanisms of epigenetic gene regulation
- lncRNA regulatory network

**RESEARCH GRANTS**

- Research Grant Council-General Research Fund (2008-P1, 2011-P1, 2012-P1)
- National Natural Science Foundation of China (2015-P1)
- Research Grant Council-Collaborative Research Fund (2010-C01)

**SELECTED PUBLICATIONS**


5. Yan HH and Cheng CY. Laminin alpha 3 forms a complex with beta3 and gamma1 chains that serves as the ligand for alpha 6beta1 integrin at the apical ectodermal specialization in adult rat testes. *J Biol Chem* 2006, 281:17286-17303.
1. Selected Publications

1. Genomic and epigenetic alterations in liver cancer
2. Non-coding RNA deregulation in liver cancer
3. Mechanisms of epigenetic gene regulation
4. Epigenetic-miRNA regulatory circuit

Liver cancer (hepatocellular carcinoma, HCC) is one of the most common malignancies worldwide and is particularly prevalent in Asia. Liver cancer is an aggressive cancer associated with a poor prognosis that is often due to late presentation of symptoms and frequent cancer metastasis. However, the molecular mechanisms underlying hepatocarcinogenesis are unclear. In addition to genetic alterations, recent evidences have indicated that epigenetic abnormalities also play a very important role in hepatocarcinogenesis. DNA methylation and histone modifications are two major epigenetic events that work very closely in regulating chromatin structure and gene expression pattern. We and others have previously shown that epigenetic alterations play a crucial role in silencing tumor suppressor genes in human cancers. We are interested to elucidate the molecular basis and pathological roles of various epigenetic modifying enzymes in human HCC. MicroRNA and long non-coding RNA are regulatory RNAs profoundly involved in epigenetic regulation and recently been implicated in human carcinogenesis. We are also interested to study the expression profiles, epigenetic alterations and molecular functions of non-coding RNAs and their roles in liver cancer development and metastasis. Our recent studies particularly focus on delineating the interplay between long non-coding RNA and epigenetic machinery and how deregulation of epigenetic-miRNA regulatory circuit implicated in liver cancer progression and metastasis. We believe that a better knowledge of the underlying molecular mechanisms of hepatocarcinogenesis and cancer metastasis is of crucial importance for the development of new diagnostic tools and therapeutic interventions for this lethal cancer.


Students learn pathology from diverse formats - Pathology leads the way

The institution of an integrated medical curriculum with the introduction of Problem Based Learning meant a drastic reduction of in lectures and practical sessions for discipline-based learning by about 25% in the first three years of the curriculum to make room for student directed learning. For the discipline of Pathology, the basis for lectures in the first 2 years of the curriculum was reduced to core material, students being taught the principles of pathology as well as basic systems based pathology.

Instead of relying on teaching per se, emphasis was put on enhancement of learning of pathology from diverse formats – lectures, practicals, web-based virtual microscopy, on-line interactive case based exercises, structured displays, PBL tutorials (see below). Key learning outcomes were clearly articulated for lectures (whole class teaching) and practicals to enable students to apply key concepts in understanding the pathogenesis of diseases and approaches to diagnoses. The practicals are “cased based” and students explore gross and histopathological changes in the context of clinical signs and symptoms.

The Department of Pathology has many teachers holding positions of leadership in undergraduate medical education who have played key and pivotal roles in the design and implementation of new tutorial cases in every module and in the introduction to health and disease blocks. As medically qualified graduates we are in a key position to see the overall picture of pathological science in the curriculum and work with basic science faculty to translate this into meaningful cases. As part of professional development, members of our department have also attended overseas medical education attachments during the special study modules which are held over the summer months.

What improvements did we make to the final years of the curriculum?

To streamline the teaching of Genetics throughout the MBBS curriculum and ensure adequate instruction, the special study modules invited the Department of Pathology to introduce in MBBS III of the 6-year curriculum two important topics, namely “Introduction of Techniques for Genetic Analysis” and “Molecular Genetic testing in acquired genetic disorders – Clinical Applications”. This would cover the techniques involved in extraction and handling of DNA, RNA, protein, as well as sequencing, microarray, and next generation sequencing. It would also illustrate the principles of molecular genetic testing through the use of important diseases. The teaching of molecular pathology and genetics was introduced as whole class sessions and through case based studies, spread over an 8-week period of the MBBS III Integrated Block.

To enhance students understanding of the role and relevance of pathology to clinical practice, we also introduced whole class seminars on “Understanding Anatomical Pathology Practice services”, “Principles and applications of immunohistochemistry”, “Investigation of immunological disorders” and “Tissue typing and transplant immunology”.

And the autopsies

The reduced time-table made it inevitable that the didactic form of autopsy teaching had to be replaced. Now, students are scheduled to visit a public mortuary with in a small group where they observe autopsies, and learn about gross pathology and the system of death investigation and certification in Hong Kong. In line with the self-directed learning philosophy, students may avail themselves of the option of autopsy attachments during the special study modules which are held over the summer months.

New Initiatives

Web-based Virtual Microscopy in Education

The microscope is a tool. Microscopy uses this tool as a means of viewing, exploring and understanding what can be visualized in the microscopic world. Students find the high-microscopy difficult as it requires practice and a helping hand from tutors. Many are prone to incorrect usage, viewing slides under high power magnification and out of context. With the reduction in amount of time allocated to instruction of histology and pathology, the use of microscopy has been minimized and students fail to engage with enough depth a learning activity that can enrich their understanding of morphology and function of tissues in health and disease.

Our department set up a new Core Imaging Facility based on the Aperio ScanScope System which provides high quality microscope scanning and web-based virtual microscopy. Using this system, glass microscopic slides are scanned and viewed on a computer window browser as virtual slides. These images can be stored on DVDs or accessed over the Internet. The virtual images are completely maneuverable in any direction. Thus the computer becomes the microscope.

This innovative system of teaching of Pathology Practical sessions was introduced in 2008, with overwhelming positive response. A survey of its application showed more than 90% agreed the digital demonstration facilitated more effective learning. Virtual microscopy thus altered how students learnt and interacted with course material with enhancement of the learning process.

The students found the images clearer, the demonstration process smoother and orientation of the slides easier, helping them understand pathological features better. There were numerous requests from students asking for access to the material on-line, its use for anatomy-histology practical sessions and for demonstration of gross specimens.

The application of this system for teaching encourages greater depth of engagement by students in viewing, exploring and understanding what can be visualized at the gross and microscopic level.

With the support of a University Development Fund, a dedicated server was acquired for joint hosting of Pathology and Anatomy teaching slides and images, and to allow on-line access by students of the teaching material. This system has provided the opportunity for further innovative curriculum development and the cultivation of a student-centered learning environment, in line with the University Strategic Theme to provide a rich virtual learning environment that complements other pedagogies to enrich the educational environment.
Students learn pathology from diverse formats - Pathology leads the way

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The Department of Pathology has many teachers holding positions of leadership in undergraduate medical education who have played key and pivotal roles in the design and implementation of new tutorial cases in every module and in the introduction to health and disease blocks. As medically qualified graduates we are in a key position to see the overall picture of pathological science in the curriculum and work with basic science faculty to translate this into meaningful cases. As part of professional development, members of our department have also attended overseas medical education attachments during the special study modules which are held annually. Our department is also intimately involved in the planning and factual input of the curriculum and most members of staff are either course coordinators or planners in the Undergraduate Education Committee or the Institute of Medical and Health Sciences Education (IMHSE).

What improvements did we make to the final years of the curriculum?

To streamline the teaching of Genetics throughout the MBBS curriculum and ensure adequate instruction, the special focus group on Genetics and its Clinical Applications invited the Department of Pathology to introduce in MBBS III of the 6-year curriculum two important topics, namely “Introduction of Techniques for Genetic Analysis” and “Molecular Genetic testing in acquired genetic disorders – Clinical Applications”. This would cover the techniques involved in extraction and handling of DNA, RNA, protein, as well as sequencing, microarray, next generation sequencing. It would also illustrate the principles of molecular genetic testing through the use of important diseases. The teaching of molecular pathology and genetics was introduced as whole class sessions and through case based studies, spread over an 8-week period of the MBBS III Integrated Block.

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The provision of on-line access to students of images for virtual microscopy and gross examination, provided the opportunity to disengage with the old mode of didactic teaching which was being used for pathology practical sessions and to provide the opportunity for student-centered, out of classroom learning. With support from the Center for the Enhancement of Teaching and Learning (CETL), we combined the use of digital pathology with the Moodle platform as the interface for interactive clinico-pathological case exercises for students.

This innovative system of teaching of Pathology Practical sessions was introduced in 2008, with overwhelming positive response. A survey of its application showed more than 90% agreed the digital demonstration facilitated more effective learning. Virtual microscopy thus altered how students learnt and interacted with course material with enhancement of the learning process.

The students found the images clearer, the demonstration process smoother and orientation of the slides easier, helping them understand pathological features better. There were numerous requests from students asking for access to the material on-line, its use for anatomy-histology practical sessions and for demonstration of gross specimens.

The application of this system for teaching encourages greater depth of engagement by students in viewing, exploring and understanding what can be visualized at the gross and microscopic level.
These are case-based exercises presenting students with short clinical vignettes, with visual demonstration of pertinent pathologic features linked to the Aperio system, followed by a series of questions designed to cover the important teaching points for each disease entity with the aim of expanding the use of on-line interactive learning experience beyond the class room setting. Its purpose was to integrate pathological entities within clinical vignettes, so that students would have better opportunity to appreciate and understand the relevance of pathology in the clinical setting and to integrate multidisciplinary aspects in the learning of pathology.

These cases would thus be complementing PBL, but specifically supporting the disciplinary knowledge of pathology and its application in medicine, by provision of clinical data and the application of interpretative skills. The focus was on disciplinary knowledge and skills of visual interpretation and its application to medicine.

In anticipation of the double cohort intake of MBBS students, the use of on-line interactive learning experience by students would help us achieve adequate in-depth teaching of pathology without the need of having to multiply the number of teachers or their delivery time.

This innovative form of Pathology Teaching was given specific commendation by visiting team from the Hong Kong Medical Council during the Accreditation Exercise of Medical Education and Training of HKU in November 2013.

The Bachelor of Biomedical Sciences degree was introduced by our Medical Faculty in 2012. The objective of this program is to nurture graduates with a broad range of core knowledge in different biomedical science disciplines so as to prepare them for a variety of opportunities in academia, industry or other career paths. We would produce flexible and well-informed graduates with strategic training in the advanced management of patients.

Pathology plays an important role in this mission by facilitating knowledge in different biomedical science disciplines so as to prepare them for a variety of opportunities in academia, industry or other career paths. We would produce flexible and well-informed graduates with strategic training in the advanced management of patients.
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This innovative form of Pathology Teaching was given specific commendation by visiting team from the Hong Kong Medical Council during the Accreditation Exercise of Medical Education and Training of HKU in November 2013.
This program was launched in September 2010 with the aim of providing health care professionals with a deeper understanding of the molecular and genetic basis of diseases and the application of molecular technologies in human disease. The Postgraduate Diploma in Molecular and Diagnostic Pathology (PDipMDPath) has been approved by the Medical Council of Hong Kong as a quotable qualification.

Rapid advances in molecular sciences have revolutionized approaches to diagnosis, treatment and management of many human diseases. With a vision to providing a structured postgraduate course on molecular and diagnostic pathology, we launched this programme in 2010 with the purpose of providing health care professionals with a deeper understanding of the molecular and genetic basis of diseases and the application of molecular technologies in disease management.

Emphasis is given to understanding molecular and diagnostic pathology with view to clinical translational application to equip participants meet the increasing expectations in health care from patients and the public.

Suitable for specialists, resident specialists, community physicians and medical laboratory staff responsible for developing, managing and providing molecular diagnostic services, the Course will be delivered through didactic teaching and discussion as part of the learning experience and assessment exercises and completion of a project report. On-line teaching and discussion as part of the learning experience will facilitate overseas student participation.

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It consists of a 2-year part-time course consisting of 8 weekend sessions offered every 2 years.

**Molecular Pathology Modules**
- Principles and Techniques of Molecular Pathology
- Clinical Applications of Molecular Testing
- Practical Course in Laboratory Methods
- Fundamentals of Genetic Testing for Hereditary Disorders
- Clinical Applications of Genetic Testing in Inherited Diseases and Genetic Counselling

**Diagnostic Pathology Modules**
- Molecular Microbiology and Infectious Diseases Update
- Chemical Pathology, Immunology, Diagnostic Haematology and Transfusion Medicine
- Essential Anatomical Pathology for Clinicians

Candidates who have completed five modules of the course with completion of a Project, or completed all seven modules of the courses can be awarded the Postgraduate Diploma (PDipMDPath), whilst those with the appropriate three modules completed be awarded the Postgraduate Certificate (PCMDPath).

Participants who wish to undertake individual modules  or specific sections within the Diagnostic Pathology Modules may also do so as occasional students with award of CME points.

**HONORARY TEACHERS**

We are very appreciative of the contributions made by our Honorary Teachers towards the enhancement of our medical students’ learning and understanding in Pathology.

**HONORARY CLINICAL PROFESSORS**
- Professor NGAN Yuen-lou Sheung Hoixait
- Professor Sidney TAM
- Professor YUEN Siu-Tsian

**HONORARY PROFESSORS**
- Professor CAO Xueqiao
- Professor HO Chi-Suk Faith
- Professor HOU Lee-Tsun Laurence
- Professor LUK Moon-Ching John
- Professor WAN Siu-Ting

**HONORARY CLINICAL ASSOCIATE PROFESSORS**
- Dr CHAN On-Kei Angel
- Dr CHAN Shuang-Wai Gavin
- Dr CHAN Yuk-Tat Eric
- Dr CHEUNG Man-Fung Florence
- Dr CHOW Yu-Da Eudora
- Dr CHU Wan Raymond
- Dr HA Shau-Yi
- Dr KIKOK Siu-Yin Janette
- Dr LAM Chun-Ki Clarence
- Dr LEUNG Chung-Ying
- Dr LO Fai-Man Ivan
- Dr LOKE Shee-Loong
- Dr LUI Yiu-Hoi
- Dr LUK Sheung-Ching Ivy
- Dr MA Kwok-Fai Tony
- Dr MA Shiu-Kwan Edmund
- Dr MA TUNG Lily
- Dr MAK Mo Chiwa
- Dr NG Wai-Kuen
- Dr NG Wing-Fung

**HONORARY ASSOCIATE PROFESSORS**
- Dr CHAN Tin-Leung
- Dr David KAN
- Dr Angus Hunter McCraw

**HONORARY ASSISTANT PROFESSORS**
- Dr AU Yuen-Ling Elaine
- Dr CHAN Ngot-Huin Alice
- Dr CHEN Pak-Lam Sammy
- Dr CHENG Yue
- Dr CHING Choi-Kwan Doris
- Dr CHEI Wai-Lap
- Dr HO Siu-Lun Ronnie
- Dr IP Ho-Wan
- Dr KAM Kwok-Ling
- Dr KAN Nin-Chi Amanda
- Dr LAM Wai-Kee
- Dr LEE Chau-Kwong
- Dr LEE Han-Chih Hanchor
- Dr LEUNG Fung-Shan Kate
- Dr LEUNG Kin-Chung
- Dr LEUNG Yuk-Yan Rock
- Dr LIANG Yu-Shan
- Dr LIONG Florence
- Dr IP Wai-Ki Ricky
- Dr LEE Sai-Ki Joseph
- Dr TANG Chauk-On Johnny

**HONORARY CLINICAL ASSOCIATE PROFESSORS**
- Dr TANG Cheuk-On Johnny
- Dr LAM Wai-Kwok
- Dr LEUNG Yat-Chun
- Dr LEUNG Yat-Fung
- Dr LEUNG Yuk-Man
- Dr MA Tsz-Wai
- Dr MA Yuk-Man
- Dr NG Wai-Kuen
- Dr NG Wing-Fung
- Dr NIG Wai-Kuen
- Dr NG Wing-Fung
EMphasis is given to understanding molecular and diagnostic pathology with view to clinical translational application that will facilitate overseas student participation. Rapid advances in molecular sciences have revolutionized the understanding of the molecular and genetic basis of diseases and the application of molecular technologies in human disease. The Postgraduate Diploma in Molecular and Diagnostic Pathology (PDipMDPath) has been approved by the Medical Council of Hong Kong as a quotable qualification.

This program was launched in September 2010 with the aim of providing health care professionals with a deeper understanding of the molecular and genetic basis of diseases and the application of molecular technologies in human disease. The Postgraduate Diploma in Molecular and Diagnostic Pathology (PDipMDPath) has been approved by the Medical Council of Hong Kong as a quotable qualification.

Rapid advances in molecular sciences have revolutionized approaches to diagnosis, treatment and management of many human diseases. With a vision to providing a structured postgraduate course on molecular and diagnostic pathology, we launched this programme in 2010 with the purpose of providing health care professionals with a deeper understanding of the molecular and genetic basis of diseases and the application of molecular technologies in disease management.

Emphasis is given to understanding molecular and diagnostic pathology with view to clinical translational application to equip participants meet the increasing expectations in health care from patients and the public.

It consists of a 2-year part-time course consisting of 8 weekend sessions offered every 2 years.

Molecular Pathology Modules
- Principles and Techniques of Molecular Pathology
- Clinical Applications of Molecular Testing
- Practical Course in Laboratory Methods
- Fundamentals of Genetic Testing for Hereditary Disorders
- Clinical Applications of Genetic Testing in Inherited Diseases and Genetic Counselling

Diagnostic Pathology Modules
- Molecular Microbiology and Infectious Diseases Update
- Chemical Pathology, Immunology, Diagnostic Haematology and Transfusion Medicine
- Essential Anatomical Pathology for Clinicians

Candidates who have completed five modules of the course with completion of a Project, or completed all seven modules of the courses can be awarded the Postgraduate Diploma (PDipMDPath), whilst those with the appropriate three modules completed be awarded the Postgraduate Certificate (PCMDPath).

Participants who wish to undertake individual modules or specific sections within the Diagnostic Pathology Modules may also do so as occasional students with award of CME points.

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- Dr CHENG Yue
- Dr CHINS Chor-Wan Diris
- Dr CHOI Wai-Lap
- Dr HO Sui-Lun Ronnie
- Dr IP Ho-Wan
- Dr KAM Kwok-Ling

**HONORARY ASSISTANT PROFESSORS**
- Dr CHAN Ka-Kui
- Dr CHAN Yuan-Kwong Calvin
- Dr CHUNG Lap-Ping

**HONORARY TEACHERS**

**Course Co-ordinator:** Dr Si Chi Chu Jason

**Module Coordinators:** Professor Cheung Nga Yin Annie
Professor Khoo Li Soon
Professor Lam Ching Wan
Dr Chan Kwok Wah
Dr So Chi Chu Jason
Dr Yam Wai Ping Judy
Dr Yam Wing Cheong

**Academic Director:** Professor Khoo Li Soon

**POSTGRADUATE CERTIFICATE IN MOLECULAR AND DIAGNOSTIC PATHOLOGY**

**POSTGRADUATE DIPLOMA IN MOLECULAR AND DIAGNOSTIC PATHOLOGY**

**Academic Director:** Professor Khoo Li Soon
**Course Co-ordinator:** Dr Si Chi Chu Jason

**Module Coordinators:** Professor Cheung Nga Yin Annie
Professor Khoo Li Soon
Professor Lam Ching Wan
Dr Chan Kwok Wah
Dr So Chi Chu Jason
Dr Yam Wai Ping Judy
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**Academic Director:** Professor Khoo Li Soon
**Course Co-ordinator:** Dr Si Chi Chu Jason

**Module Coordinators:** Professor Cheung Nga Yin Annie
Professor Khoo Li Soon
Professor Lam Ching Wan
Dr Chan Kwok Wah
Dr So Chi Chu Jason
Dr Yam Wai Ping Judy
Dr Yam Wing Cheong
TECHNICAL AND ADMINISTRATIVE SUPPORT

Our commitment towards research, clinical services and teaching excellence is supported by a dedicated and outstanding team of technical and supporting staff, with a wide range of laboratory and technical expertise. Without these staff the research and clinical service would not be of the high standard that has led to our laboratories being accredited by the College of American Pathologists.

At present Ms Annie Chan, the Department’s Chief Technician, leads a team of 21 full-time technical and supporting staff, serving in various research/teaching laboratories of the Department.

On the administration side, our Administrative Assistant Mr Raymond Ho supervises 7 executive and support staff, including a Program Assistant for the State Key Laboratory for Liver Research (HKU), providing administrative and secretarial support to the Department.

RESEARCH THEMES AND DIRECTIONS

The Department of Pathology puts great emphasis on, and stands at the forefront of, both medical and scientific research. The department currently has 23 full-time academic staff, all taking an active part in cutting-edge biomedical research. In collaborations with our clinical colleagues, we study different forms of human diseases from clinical samples to animal models, and from epidemiology to molecular mechanisms. Cancer, Immunology and Infections, Stem Cell Biology, Forensic Pathology and Chemical Pathology are the 5 major themes of our research activities.

Cancer
- Molecular Genetics
- Signaling
- Angiogenesis
- Animal Models
- Epigenetics
- Epidemiology

AU YEUNG Kwok-Him Rex
CHAN Kwok-Wah
CHEUNG Nga-Yin Annie
IP Pun-Ching Philip
KHOO Ui-Soon
LEE Kin-Wah Terence
LEUNG Suet-Yi
LI Xiu-Ling Vivian
LO Cheuk-Lam Regina
LU Lixei
NG Oi-Lin Irene
John Malcolm NICHOLLS
WONG Chak-Lui Carmen
WONG Chun-Ming Jack
WONG Pik Maria
YAM Wai-Ping Judy
YAN Hoi-Ning Helen

Stem Cells & Gene Therapies

CHEUNG Nga-Yin Annie
KHOO Ui-Soon
LEE Kin-Wah Terence
LU Lixei
NG Oi-Lin Irene

Infection & Immunity
- Immunity to Infections
- Anti-tumor Immunity
- Pathogenesis of Autoimmunity
- Developmental Immunology

CHAN Sau-Fong Vera
HUANG Fang-Ping
KHOO Ui-Soon
LU Lixei
John Malcolm NICHOLLS

Forensic Medicine
- Forensic Pathology
- Homicides
- Law & Ethics

BEH Swan-Lip Philip

Chemical Pathology
- Inborn errors of metabolism
- Molecular genetic pathology
- Clinical toxicology and personalized medicine
- Toxic exposure surveillance and biomonitoring

LAM Ching-Wan
LAW Chun-Yiu Eric
TECHNICAL AND ADMINISTRATIVE SUPPORT

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Cancer
- Molecular Genetics
- Signaling
- Angiogenesis
- Animal Models
- Epigenetics
- Epidemiology

Stem Cells & Gene Therapies

Infection & Immunity
- Immunity to Infections
- Anti-tumor Immunity
- Pathogenesis of Autoimmunity
- Developmental Immunology

Forensic Medicine
- Forensic Pathology
- Homicides
- Law & Ethics

Chemical Pathology
- Inborn errors of metabolism
- Molecular genetic pathology
- Clinical toxicology and personalized medicine
- Toxic exposure surveillance and biomonitoring

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CHEUNG Nga-Yin Annie
IP Pun-Ching Philip
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LU Liwei
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WONG Chun-Ming Jack
WONG Pik Maria
YAM Wai-Ping Judy
YAN Ho-Ning Helen

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KHOO Ui-Soon
LEE Kin-Wah Terence
LU Liwei
NG Oi-Lin Irene
CHAN Sau-Fong Vera
HUANG Fang-Ping
KHOO Ui-Soon
LU Liwei
John Malcolm NICHOLLS

BEH Swan-Lip Philip

LAM Ching-Wan
LAW Chun-Yiu Eric
AWARDS AND HONORS

Endowed Professorships

Laurence LT Hou Professor in Anatomical Molecular Pathology
Professor Annie Nga Yin Cheung
Professor Khoo Ui Soon
Professor Leung Suet Yi
Professor John Nicholls
Professor Irene Oi Lin Ng

Croucher Senior Medical Research Fellowship
Professor Lu Liwei

Outstanding Researcher Award
Professor Leung Suet Yi
Professor Lu Liwei
Professor Irene Oi Lin Ng

Outstanding Young Researcher Award
Dr Judy Wai Ping Yam

Outstanding Research Student Supervisor Award
Professor Annie Nga Yin Cheung
Professor Irene Oi Lin Ng

Research Output Prize


Faculty Outstanding Research Output Award


RESEARCH POSTGRADUATE

Research Postgraduate Students
Between 1997 and 2015, 56 PhD, 39 MPhil and 135 MMedSc students have graduated from our department. Many of them have received distinguished awards for their research excellence including the Swire Scholarships, ‘Young Investigator Award’ of the Hong Kong International Cancer Congress, YS and Christabel Lung Postgraduate Scholarship and Best Presentation Award of the Research Postgraduate Symposium. Currently, there are 18 PhD, 8 MPhil and 18 MMedSc students in our department.

Student Achievements and Awards (academic year 2012 – 2015)

Current Students

- **Gao Xuyuan, PhD (Supervisor: Dr MP Wong)**
  - Hong Kong PhD Fellowship 2014-2015

- **Gong Chun, PhD (Supervisor: Professor US Khoo)**
  - Wong Ching Yee Medical Postgraduate Scholarships 2013

- **Lai Kit Ho, MPhil (Supervisor: Dr CCL Wong)**
  - Best Presentation Award, Research Postgraduate Retreat, Department of Pathology, The University of Hong Kong, February 2015

- **Lee Siu Po, PhD (Supervisor: Professor SY Leung)**
  - Sir Edward Youde Memorial Fellowships 2011-2012
  - Swire Scholarships for Research Students in Residence at Robert Black College, 2011
  - Faculty Outstanding Research Output Award, Li Ka Shing Faculty of Medicine, December 2012
  - Best Presentation Award, Research Postgraduate Retreat, Department of Pathology, The University of Hong Kong, July 2012, March 2014
  - University Postgraduate Fellowship 2014-2015

- **Tey Sze Kiong, PhD (Supervisor: Dr JWP Yam)**
  - Best Presentation Award, Research Postgraduate Retreat, Department of Pathology, The University of Hong Kong, July 2013
  - Best Presentation Award, Research Postgraduate Symposium, Li Ka Shing Faculty of Medicine, The University of Hong Kong, December 2014
  - Graduate Student Travel Scholarship, Tigris Educational Fund, March 2015

- **Xiao Fan, PhD (Supervisor: Professor LW Lu)**
  - University Postgraduate Fellowship 2014-2015
AWARDS AND HONORS

Laurence LT Hou Professor in Anatomical Molecular Pathology
Professor Annie Nga Yin Cheung

LAKE YEW PROFESSOR IN PATHOLOGY
Professor Annie Nga Yin Cheung

Croucher Senior Medical Research Fellowship
Professor Annie Nga Yin Cheung

Professor Khoo Ui Soon
Professor Leung Suet Yi
Professor John Nicholls
Professor Irene Oi Lin Ng

Croucher Senior Research Fellowship
Professor Lu Liwei

Outstanding Researcher Award
Professor Leung Suet Yi
Professor Lu Liwei
Professor Irene Oi Lin Ng

Outstanding Young Researcher Award
Dr Judy Wai Ping Yam

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Professor Annie Nga Yin Cheung
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Research Output Prize

Faculty Outstanding Research Output Award

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Leung Man-Hong, PhD (Supervisor: Professor US Khoo)
• Graduate Student Travel Scholarship, Tigris Educational Fund, March 2015

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Current Students

Xiao Zhijie, PhD (Supervisor: Dr MP Wong)
- YS and Christabel Lung Postgraduate Scholarship 2013/14
- Best Presentation Award, Research Postgraduate Retreat, Department of Pathology, The University of Hong Kong, July 2014

Xu Mingjing, PhD (Supervisor: Professor IOL Ng)
- Young Investigator Award, Hong Kong International Cancer Congress (HKICC), November 2014
- Best Poster Presentation Award, Research Postgraduate Symposium, Li Ka Shing Faculty of Medicine, The University of Hong Kong, December 2014

Graduated Students

Kai Ka-Lun Alan, PhD 2013 (Supervisor: Professor IOL Ng)
- Outstanding Poster Presentation, 16th Research Postgraduate Symposium, LKS Faculty of Medicine, 2011
- Best Presentation Award, Research Postgraduate Retreat, Department of Pathology, The University of Hong Kong, February 2012, March 2013

Lau Yuen-Ting, PhD 2014 (Supervisor: Dr TKW Lee)
- Outstanding Poster Presentation, 17th Research Postgraduate Symposium, LKS Faculty of Medicine, The University of Hong Kong, December 2012
- Graduate Student Travel Scholarship, Tigris Educational Fund, January 2013
- Young Investigator Award, The 26th Hong Kong International Cancer Congress, November 2013
- Best Presentation Award, The 19th Annual Meeting of the Korean Association for the Study of the Liver, June 2013
- Travel Award, The 19th Annual Meeting of the Korean Association for the Study of the Liver, June 2013
- YS and Christabel Lung Postgraduate Scholarship 2013/14

Lo Jessica, MPphil 2015 (Supervisor: Dr TKW Lee)
- Wong Ching Yoo Medical Postgraduate Scholarships 2013/14
- Li Ka Shing Prizes 2013-2014

Tsang Ho-Ching Felice, PhD 2014 (Supervisor: Dr JCM Wong)
- Best Presentation Award, Research Postgraduate Retreat, Department of Pathology, The University of Hong Kong, July 2013

Wang Xiao-Hui, PhD 2014 (Supervisor: Professor LW Lu)
- Best Presentation Award, Research Postgraduate Retreat, Department of Pathology, The University of Hong Kong, March 2014

RESEARCH INFRASTRUCTURE AND CORE FACILITIES

The Department of Pathology is well-equipped with essential facilities. Eleven research laboratories are housed in the University Pathology Building, Queen Mary Hospital Compound and Laboratory Block, Li Ka Shing Faculty of Medicine Building, with state-of-the-art research equipment made available to researchers and students at our Core Facility Suite. The fully-equipped research laboratory located in the Li Ka Shing Faculty of Medicine Building was generously donated by the SH Ho Foundation in 2003, and has since become our second major base for cutting-edge medical research.

Research Laboratories:
- Breast Cancer Genetics Research Laboratory
- Gastrointestinal Cancer Genetics Laboratory
- Genetics and Metabolomics Research Laboratory
- Gynaecological Diseases Research Laboratory
- Haematology Research Laboratory
- Immunology Laboratory (Lymphocyte Development and Autoimmunity)
- Liver Cancer and Hepatitis Research Laboratory
- Lung Diseases Research Laboratory
- Lymphoma Research Laboratory
- Nasopharyngeal Diseases Laboratory
- Urological Cancer Research Laboratory

State-of-the-art Equipment:
- TECAN Automated Robotic System for IHC and ISH
- Aperio ScanScope CS System
- Real-time Quantitative PCR System
- Comparative Genomic Hybridization (CGH) station
- BD FACSCalibur Flow Cytometer
- Kodak Imaging Station
- Tissue Arrayer
- ABI 7900HT Sequence Detection System
- Aperio ScanScope CS System
- TECAN Multimode Robotic System for IHC and ISH
- Kodak Imaging Station
- Pathology CS System
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- Kodak Imaging Station
- Tissue Arrayer
The State Key Laboratory for Liver Research (SKLLR or the Lab) was officially set up in 2010, with the approval of the Ministry of Science and Technology of Mainland China in 2009. The SKLLR is a partner laboratory with State Key Laboratory of Oncogenes and Related Genes of Shanghai. The SKLLR is dedicated to enhance the understanding of the pathogenetic mechanisms of liver cancer, hepatitis B virus (HBV) infection and cirrhosis by engaging in cutting-edge basic research and to devise better diagnoses and new/better treatment modalities for liver cancer and HBV infection.

The Lab has top local physicians, surgeons, pathologists and basic scientists with interests and commitment in basic and clinical research for liver diseases. Furthermore, the Laboratory, together with a tertiary hepatitis treatment center and a top-class liver transplant center and through meticulous prospective studies, confers a major benefit to the society. Capitalizing on the existing strength on molecular biology, cancer genetics, functional proteomics, virology, and clinical trials of surgical and non-surgical treatments, the SKLLR aims to develop better/earlier diagnosis and treatment modalities to prevent, retard, and treat HBV and its life-threatening complications in liver diseases. New drugs or related lead compounds developed will attract venture capitals to further establish biomedical industry in Hong Kong.

By organizing symposiums, seminars and various other activities, the Lab aims to enhance the exchange of liver diseases research and technology development in the local medical and research communities as well as in the region. Training of young scientists for the next generation is a strong commitment of the SKLLR.

Website: [http://www.skllr.hku.hk](http://www.skllr.hku.hk)
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THE HONG KONG PATHOLOGY FORUM

Since 2013, the Hong Kong Pathology Forum has been held every January/February and has become the annual flagship event of our Department.

The Forum aims at promoting dialogues and knowledge exchange amongst pathology professionals and members of the medical community. It focuses on the cutting-edge developments of modern pathology with strong emphasis from the clinical and treatment perspectives of different disciplines.

The Forum provides latest as well as practical knowledge in the various disciplines of Pathology, through state-of-the-art presentations by eminent speakers and specialists in their respective fields of study, such as Professor Brian Rubin, Professor Yasuni Nakanuma, Dr Xin Wei Wang, Dr Jennifer Hunt and Dr Kristopher Cunningham. The attendance of the Forum has also been steadily increasing over the years, with attendants of diverse professional background such as pathologists, clinicians, physicians, medical practitioners as well as allied health professionals.

The Hong Kong Pathology Forum incorporates the two named lectures, including the Hou Pao-Chang Memorial Fund Lecture, and the James Gibson Lecture. The Hou Pao-Chang Memorial Fund was established by Professor Laurence Hou to commemorate the distinguished career of his father, who was also Head of our Department between 1948 and 1960. On the other hand, the James Gibson Fund was established by friends and colleagues of our late Emeritus Professor James Gibson, who was the Chair of Pathology from 1963 to 1983, in honor of his retirement after many years of distinguished service to the University and the community.

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improved management of gynaecological cancers. Professor Cheung is interested in the application of cutting-edge molecular biology techniques in the early detection and improved management of gynaecological cancers.

Dr Chan Kwok-Wah
Clinical work covers surgical pathology, cytopathology and autopsy aided by molecular studies. Areas of special interest are renal and urological pathology, an interest which has developed over many years of clinical practice and research. Overseas training in renal pathology was under Prof. J. Tighe of St. Thomas’s Hospital, London. The number of renal biopsies currently stands at about 250 a year. An almost equal number of consultation cases comprises biopsies from private hospitals and Macau’s Central Hospital. An archive of renal biopsy materials is maintained for convenient case review and training in diagnostic renal pathology.

Professor Cheung Nga-Yin Annie
Besides a general anatomical pathology service, Professor Cheung is also the key pathologist in gynaecological histopathology and cytology. She has trained with world renowned experts in gynaecological pathology including Professor Harold Fox, University of Manchester, Professor Robert E Scully, Massachusetts General Hospital and Professor Henry J Norris, Armed Forces Institute of Pathology. Professor Cheung is involved in the weekly Gynaecological Tumour Board meeting and the training of gynaecological pathology. She is the Pathologist in Charge of the Cervical Cytology Laboratory, The University of Hong Kong, the first laboratory in Hong Kong accredited by the College of American Pathologists. It is also one of the first Asian laboratories to adopt large scale liquid based cervical cytology, automated cytology imaging and molecular detection of the human papilloma virus. Professor Cheung is interested in the application of cutting-edge molecular biology techniques in the early detection and improved management of gynaecological cancers.

We provide an independent autopsy service for families, insurers, lawyers, etc., consultation for review of death investigations, death reports, autopsy reports for civil as well as criminal cases and expert opinions and evidence in criminal and civil trials. We also hold consultations and give advice on management of victims of child abuse, adult and child sexual abuse, and victims of assaults where interpretation of injuries is required. Other services include consultation and examination for victims of human rights abuses and asylum seekers and consultation and advice on interpretation of forensic evidence for lawyers.

Dr Ip Pun-Ching Philip
Dr Ip subspecializes in Gynaecological Pathology. He was trained by Drs Robert H Young and Philip B Clement at Harvard Medical School, Massachusetts General Hospital, Boston, and University of British Columbia, Vancouver General Hospital, Vancouver, respectively, and has since, accumulated 15 years of experience in this specialty. Dr Ip is actively involved with subspecialty-related commitments in Queen Mary Hospital which include peer-review of all in-house gynaecological pathology cases as well as outside referrals. Dr Ip is a key member of the HKWC Gynaecological Oncology team and chairs weekly Tumor Board Meetings with Departments of Obstetrics and Gynaecology and Clinical Oncology. Local and international pathology consultation service is also provided. Dr Ip is in-charge of the hospital Cytopathology laboratory service at Queen Mary Hospital and actively involved with laboratory quality assurance.

Professor Khoi Uil-Sooon
In addition to general anatomical pathology service of diagnostic surgical biopsy and cytology, Professor Khoi is specialized in breast pathology, having trained at the Nottingham City Hospital under Professor CW Elston and Dr. Ian Ellis. Working closely with the surgeons, radiologists and oncologists as a multidisciplinary breast team, we hold regular multi-disciplinary meetings to review cytology, histology and radiological findings with view to management. From longstanding collaborative work with the Samuel Lunenfeld Research Institute, Mount Sinai Hospital, Toronto, Canada, she has acquired expertise in genetic testing for hereditary breast cancer, namely for BRCA1 and 2 gene mutations. Individual referrals will be given genetic counseling and mutation testing offered if appropriate. As part of the University Molecular Pathology Laboratory services, she has also contributed to setting up the Fluorescent In-Situ Hybridization (FISH) assay for HER2 amplification in breast cancer.

Professor Lam Ching-Wan
Professor Lam trained as a chemical pathologist in Hong Kong and overseas with an emphasis on inborn errors of metabolism, molecular genetic pathology, prenatal diagnosis of genetic diseases, toxicology, drug metabolism and pharmacokinetics. He supervises residents undergoing specialist training while providing clinical services in the Hong Kong West Cluster. He receives clinical consultation for testing of genetic diseases.

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Dr Law Chun-Yiu Eric
As a duty biochemist in the Division of Clinical Biochemistry, laboratory services include endocrinology and molecular biology, lipid profile, inherited metabolic disorders, therapeutic drug monitoring and toxicology, micronutriert and heavy metal, general chemistry and paediatric chemistry are provided to the Queen Mary Hospital and actively involved with laboratory quality assurance.

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Overseas training in renal pathology includes microdissection, immunohistochemistry and molecular biology. Professor Khoo is specialized in breast pathology, having trained at the Royal Victoria Hospital and University of British Columbia, Vancouver, respectively, and has since, accumulated 15 years of experience in this specialty. Dr Ip is actively involved with subspecialty-related commitments in Queen Mary Hospital which include peer-review of all in-house gynaecological pathology cases as well as outside referrals. Dr Ip is a key member of the HKWC Gynaecological Oncology team and chairs weekly Tumor Board Meetings with Departments of Obstetrics and Gynaecology and Clinical Oncology. Local and international pathology consultation service is also provided. Dr Ip is in-charge of the hospital Cytopathology laboratory service at Queen Mary Hospital and actively involved with laboratory quality assurance.

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Professor Ng Oi-Lin Irene

On top of a general anatomic pathology service, Professor Irene Ng is specialized in liver pathology including hepatitis, liver cancer and liver transplantation. She was trained at King’s College Hospital and Royal Free Hospital with Prof. Bernard Portmann and Peter Scheuer for liver pathology. She has been the chief pathologist of the liver transplant team at University of Hong Kong - Queen Mary Hospital since the first successful liver transplantation in 1991 and has been responsible for reporting liver transplant pathological diagnoses. The liver transplantation team at HKU has established a very successful transplantation program with a number of ‘firsts’ in Hong Kong and internationally. She has also trained a number of scholars from different parts of the world in liver transplant pathology.

Dr So Chi-Chiu Jason

The Haematology Laboratory and Blood Bank at Queen Mary Hospital provides a comprehensive diagnostic service for a wide range of haematological disorders. Investigations on acquired and hereditary white cell and red cell disorders, bleeding and thrombotic diseases, thalassaemias, haematological malignancies and serological problems are available. Cytogenetic and molecular genetic techniques are employed to aid both diagnosis and patient monitoring. We provide regular services to the Hong Kong West Cluster and receive consultations and referrals from both public and private hospitals on a territory-wide basis.

Professor John Malcolm Nicholls

Professor Nicholls trained as an anatomical pathologist in Adelaide, Australia with an emphasis on paediatric pathology. When he came to Hong Kong, in addition to paediatric pathology work he focused on nasopharyngeal carcinoma diagnosis and monitoring after radiotherapy, and on other diseases of the head and neck. He holds regular meetings with paediatric oncologists and surgeons and has been involved in clinical head and neck presentations.

Dr Wong Pik Maria

Dr Wong is a diagnostic anatomical pathologist with expertise in lung pathology. She has set up the molecular diagnostic service for testing of oncogene mutations in lung cancer including EGFR and ALK fusion genes in the University Pathology Laboratory. A tissue triage service is established for the Molecular Pathology Laboratory, Department of Pathology, Queen Mary Hospital. She is also a trained cytopathologist with special expertise in performing and interpreting fine needle aspiration biopsies of palpable lesions.

Established since 1992, the HKU Cervical Cytology Screening Laboratory has been dedicated to the continuous improvement of cervical cytology screening in Hong Kong, with nearly 1.2 million samples reported with an average of 80,000 cases per annum.

The Laboratory is a pioneer in the introduction of state-of-the-art technologies:
- In March 2000, liquid based cytology technology approved by the United States Food and Drug Administration (FDA) was adopted for full scale cervical cancer screening.
- In 2001, the Cervical Cytology Screening Laboratory became the first laboratory in Hong Kong to be accredited by the College of American Pathologists, the laboratory has maintained CAP accreditation status since that date.
- In 2004, a pilot study on HPV testing for triage of women with atypical squamous cells of undetermined significance (ASCUS) in cervical smears was conducted with the generous support of the SK Yee Medical Foundation.
- In July 2005, the Laboratory was the first in Hong Kong and Asia to introduce the latest model of automated cervical cytology screening imager approved by the United States Food and Drug Administration (FDA).
- The impressive results encouraged the adoption of reflex HPV test for women with cervical cytology diagnosed with ASCUS from Jan 2007.

Our services are accredited by the College of American Pathologists (CAP).
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**CLINICAL SERVICES TO THE COMMUNITY**

**HKU CERVICAL CYTOLOGY SCREENING LABORATORY**

Laboratory Director: Professor Annie NY Cheung

Deputy Laboratory Director: Dr Maria P Wong

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CLINICAL SERVICES TO THE COMMUNITY

TISSUE PROCESSING AND REPORTING LABORATORY

Laboratory Director: Professor Annie NY Cheung

Our tissue processing and reporting laboratory provides a tissue processing service for surgical biopsy specimens. This includes tissue processing, embedding, microtome-sectioning, and H&E staining. Pathologists perform macroscopic description, block-sampling of specimens such as cervical LEEP excision, as well as pathology reporting. Our services are accredited by the College of American Pathologists (CAP).

Tissue Microarray is the construction of a paraffin embedded block, comprised of multiple tissue elements derived from individual “donor” tissue blocks. It allows cost-effective production of immunohistochemistry and in situ hybridization. Our services can be applied for clinical and translational research including clinical trials and contracted research.

CLINICAL SERVICES TO THE COMMUNITY

HEREDITARY GASTROINTESTINAL CANCER GENETIC DIAGNOSIS LABORATORY

Laboratory Directors: Professor SY Leung and Professor ST Yuen

Doctor: Dr Ronnie SL Ho

The Hereditary Gastrointestinal Cancer Genetic Diagnosis Laboratory was established since 1995. We are currently providing genetic tests, genetic counseling, psychosocial support and advice and referral for prophylactic screening for families at risks for the Lynch (also known as Hereditary Nonpolyposis Colorectal Cancer, HNPCC), Familial Adenomatous Polyposis (FAP) and other types of Polyposis syndromes. This is a charitable service supported by the Hong Kong Cancer Fund, aiming to achieve colon cancer prevention in local high risk families through genetic testing and appropriate prophylactic screening. Since 2006, we have gained support from St. Paul’s Hospital that allows us to set up a charitable patient referral centre in their hospital venue to facilitated population-wide patient recruitment. The Laboratory works in collaboration with all public and private doctors in Hong Kong to provide a comprehensive genetic diagnosis service, so as to help them to plan appropriate prophylactic screening for at risk individuals. Over the years, these have resulted in hundreds of polyps or early cancers being removed and thus saving lots of lives. More importantly, with our service, a lot of individuals from these at risk families are proven not inherited the cancer-predisposing mutations, and thus leads in great savings on medical resources and relief of psychological burden. To date, over 1000 families has benefited from our genetic diagnosis service. Amongst these, 263 families were confirmed to carry HNPCC, APC, PJS, JP, PTEN or TP53 gene germline mutations, with predictive genetic testing done for over 1180 family members. The laboratory has generated a large database on mutation spectrum of DNA mismatch repair gene in Chinese population, and uncovered a novel mechanism causing HNPCC through EPCAM gene deletion, the latter has become a standard genetic test worldwide. These have resulted in numerous high profile publications of both local and global importance, in prestigious journals including Nature Genetics and American Journal of Human Genetics. Our laboratory has provided the innovative model for academic researchers to serve the community through partnership with charitable organization, public and private health care providers.
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**Cancer molecular prognostic marker for “personalized medicine”**

**A. BCR/ABL kinase mutation detection for chronic myelogenous leukaemia and related disorders**
Detection of BCR/ABL kinase mutation by semi-nested PCR and subsequent sequencing of cDNA extracted from patients’ peripheral blood can switch management to alternative tyrosine kinase inhibitors or discontinuation of drugs.

**B. KRAS mutation detection for colorectal cancer**
No response to therapy using anti-EGFR antibodies (e.g. Cetuximab) can be enriched by microdissection in paraffin tumour blocks (including small biopsies) for tumour cells, followed by PCR and DNA sequencing to detect for KRAS mutation. The presence of KRAS mutation predicts lack of response to EGFR inhibitors in other types of cancers which can help clinicians in the choice of treatment strategy.

**C. EGFR mutation detection for lung cancer**
Lung cancer patients whose tumors show activating EGFR mutations have longer progression-free survival with first line tyrosine kinase inhibitor therapy; vice versa, wild type tumours have better PFS with conventional platinum-based chemotherapy. Thus, EGFR mutation analysis is mandatory for treatment plans. Our laboratory offers two independent testing methods – Sanger sequencing which gives all sequence information of EGFR exons 18 to 21, suitable for samples with adequate tumor content; and Q-PCR-based technology for detection of hot spot mutations only, suitable for small samples with limited tumor content. Microdissection for tumour enrichment would be performed for both tests.

**D. HER-2 amplification test for breast cancer**
PathVysion®, the only FDA approved HER-2 assay, is performed by UPL for assessment of amplification status of the HER-2 oncoprotein. The assay assists the selection of patients suitable for adriamycin-based therapy and of patients who may respond to Herceptin® treatment. The test can be performed on formalin fixed paraffin embedded surgical pathology tissue blocks.

**E. NPM1/FLT3-ITD mutation test for acute myeloid leukaemia**
Approximately 40-50% of acute myeloid leukaemia are cytogenetically normal (CN-AML). As a whole group, these CN-AML carry an intermediate prognosis. Recent studies have found that among these CN-AML, those with the combination of an insertional mutation of exon 12 of the NPM1 gene and internal tandem duplication of the juxtamembrane domain of the FLT3 gene (NPM1<->FLT3-ITD) are associated with a good prognosis and may not require an allogeneic bone marrow transplantation at first complete remission by chemotherapy. Additionally, the presence of FLT3-ITD may provide a drug target for novel tyrosine kinase inhibitors.
UNIVERSITY PATHOLOGY LABORATORY (UPL)

Laboratory Directors
Professor Annie NY Cheung (Molecular Pathology)
Professor CW Lam (Chemical Pathology)

Deputy Laboratory Directors
Professor US Khoo
Dr Maria P Wong

Honorary Accreditation Advisor
Professor Sidney Tam

The UPL has the capability to provide a wide range of testing to support cancer molecular diagnostics. The laboratory is staffed by a comprehensive panel of professoriate grade clinical pathologists for consultation and clinical interpretation of tests and employ cutting-edge technologies for diagnosis and management of human diseases along the following main themes:

• Cancer molecular prognostic marker for “personalized medicine”
• Clinical pharmacogenomics
• Early bladder cancer detection
• Genetic diagnosis of hereditary cancers and disorders
• Viruses and cancer

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Clinical pharmacogenomics

A comprehensive pharmacogenetic testing for personalized, individualized therapy is provided for guiding the treatment of diseases including selecting drug with the greatest efficacy in managing the disease and predicting adverse drug reaction for individual patients for a given drug therapy.

Genetic diagnosis of hereditary cancers and disorders

A. BRCA1/2 mutations in breast and/or ovarian cancers

Inherited alterations in BRCA1 and BRCA2 susceptibility genes may be found in cases of hereditary breast and ovarian cancer, which convey increased risk for breast and ovarian cancer. Testing should begin by identification of a specific mutation in affected family members. Once such mutation is identified, “carrier” testing can be offered to family members who wish to learn whether or not they have inherited that mutation.

B. Cardiovascular, developmental, endocrine, metabolic, neurological and skin disorders

Genetic testing of various human diseases is provided including familial endocrine tumors and disorders, inborn errors of metabolism and development such as glucose-6-phosphate dehydrogenase deficiency and Wilson disease, Long-QT syndrome, cardiomyopathy, neurogenetic and neuromuscular disorders, Parkinson’s disease and sudden infant death.

C. Multiple endocrine neoplasia (MEN) syndromes

The MEN syndromes comprise 3 genetically distinct familial diseases involving hyperplasia and cancer in several endocrine glands. Genetic testing of the MEN1 and RET genes for the MEN1 and MEN2 Familial Medullary Thyroid Carcinoma (FMT) syndromes respectively can be used for pre-symptomatic identification of at-risk individuals for early interventional management.

Viruses and cancer

A. Hepatitis B virus (HBV)

Viral load by qPCR and HBV DNA mutants detection can guide to anti-HBV viral therapy and monitoring of response and assess liver disease and cancer development.

B. Human papillomavirus (HPV) and cervical lesion/cancer

UPL provides various tests for HPV and cervical lesion or cancer:

• FDA approved Roche cobas® 4800 HPV Test for detection of 14 high risk HPV genotypes and identification of HPV 16/18 in cervical cells collected in liquid-based cytology.
• FDA approved Hybrid Capture II signal amplified chemiluminescent assay.
• Linear array HPV genotyping test can identify individual high-risk and low risk HPV genotypes for HPV assay validation.
• HPV genotyping by sequencing.

Applications:

• Reflex HPV detection test for atypical squamous cells of undetermined significance (ASC-US).
• Screening for cervical cancer and precursors.
• Monitoring for disease recurrence (Test of Cure).
• Quality control for HPV test from referral laboratories.

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Overview

Professor Sidney TAM  
Chief of Service  
Department of Pathology and Clinical Biochemistry, Queen Mary Hospital

Academic staff work closely with the Chief of Service and professional staff in the Department of Pathology and Clinical Biochemistry of Queen Mary Hospital to provide a comprehensive range of College of American Pathologists accredited diagnostic laboratory service in Anatomical Pathology, Clinical Biochemistry, Clinical Immunology, Haematology, and Transplantation & Immunogenetics, which are the 5 Divisions of the Hospital Department. The hospital staff includes 7 Consultants, 6 Associate Consultants/Senior Medical Officers, 7 Resident Trainees and 10 Scientific Officers. The Hospital also funds a number of staff who are employed by the University and who also participate in clinical diagnostic services, including a Scientific Officer who works specifically in the area of developing and utilizing diagnostic molecular pathology tests. The Department was accredited by the Royal College of Pathologists of Australasia in 2013 as a training centre for Genetic Pathology, including Biochemical Genetics and Medical Genomics.

Anatomical Pathology Division

Head: Dr SHEK Wai-Hung Tony

The Anatomical Pathology Division provides services in surgical pathology, cytodiagnosis and autopsy to Queen Mary and other hospitals in the Hong Kong West Cluster as well as other private and public hospitals in the territory on a referral basis. Pathologists with subspecialty training and interest are available for consultation on most organ systems. In 2013, it reported on 54,749 surgical specimens including 1,110 frozen section cases. In addition, 27,573 cytology specimens and 143 autopsies, including 112 Coroner’s cases, were handled. The clinical practice of Anatomical Pathology is supported by a general core laboratory and a number of special laboratories, including immunohistochemistry, electron microscopy, image analysis and molecular pathology. Like other divisions in the department, the Anatomical Pathology Division is also a certified training centre of the Hong Kong College of Pathologists, the Royal College of Pathologists of Australasia and the Royal College of Pathologists of the UK.

Haematology Division

Head: Dr LAM Chun-Kit Clarence

The Haematology Division provides a comprehensive diagnostic and consultative service to the Hong Kong West Cluster, the territory of Hong Kong and its neighbouring areas (e.g. Macau and Shenzhen). Its scope spans basic diagnostic testing, e.g. round-the-clock service for complete blood count, clotting profile (PT/APTT), malaria screening, pre-transfusion testing etc., to more sophisticated tests, e.g. multicolour flow cytometry, cytogenetics and molecular studies. The number of these latter tests constitutes the largest volume amongst all hospitals in Hong Kong. To capitalise and further on the prestigious position and tradition of haematological practice in Queen Mary Hospital, the division aspires to contribute to translational research that can guide clinical practice, especially in the fields of inherited red cell disorders (e.g. haemoglobinopathy), neoplastic haematology and transfusion science, and lead quality haematopathology practice in Hong Kong.

Clinical Immunology Division

Head: Dr CHAN Yik-Tat Eric

The Clinical Immunology Division provides a wide range of laboratory tests for diagnosis and monitoring of immunodeficiency, autoimmunity, allergy and monoclonal gammopathy. Referral service is also provided to other hospitalsclinics in and outside Hong Kong. The laboratory handles clinically relevant immunocytology, autoantibody, flow cytometry, lymphocyte and neutrophil function tests. In 2014, approximately 180,000 specimens were received and over 320,000 tests were performed. The Division also provides Clinical Allergy service in collaboration with the Department of Medicine, Queen Mary Hospital.

Transplantation and Immunogenetics Division

Head: Dr KWOK Siu-Yin Janette

The Transplantation and Immunogenetics Division (T&I) provides specialized histocompatibility testing for patients awaiting haematopoietic stem cell and solid organ transplantations, and for patients with diseases associated with certain HLA antigens and pharmacogenetics service. The T&I works closely with all transplant centers in Hong Kong to provide HLA typing, anti-HLA antibody test for solid organ transplants, and lymphocyte crossmatch work up for living and deceased donor kidney transplants. The T&I supports the Haematopoietic Stem Cell Transplant Centres in Queen Mary Hospital and Prince of Wales Hospital. The T&I also works closely with clinicians, transplant coordinators, the Hong Kong Bone Marrow Donor Registry, overseas transplant centers and donor registries to deliver quality patient-care service. In 2013, over 21,000 specimens were received and over 43,400 tests were performed.

Clinical Biochemistry Division

Head: Dr CHAN On-Kei Angel

The Clinical Biochemistry Division provides both routine and special testing as well as consultation services to Queen Mary Hospital. It also provides special diagnostic and consultation services, largely on a referral basis, to both the public and private healthcare sectors of Hong Kong outside Queen Mary Hospital. The repertoire of tests provided includes assays for hormones, immunosuppressants, therapeutic drug monitoring, heavy and toxic metals in biological fluid and tissues, trace elements, excretory and intermediates in cholesterol biosynthesis, clinical toxicology, urinary steroid profiling, biochemical and genetic work-up for neurometabolic diseases, inherited metabolic diseases and many other inherited diseases. A range of tests important for clinical emergencies are provided on an urgent basis round-the-clock and covered by duty biochemist on roster. In 2013, up to 3,800 specimens were received daily and nearly 6 million tests were performed annually, including tests for clinical drug trials. It also provides special diagnostic support and consultation service to hospitals in Macau on a referral basis. The Division has been involved in the training of endocrinologists in Hong Kong and clinical laboratory personnel from Macau since the late 90s’.

PARTNERSHIP WITH THE DEPARTMENT OF PATHOLOGY AND CLINICAL BIOCHEMISTRY, QUEEN MARY HOSPITAL
Overview

Professor Sidney TAM
Chief of Service
Department of Pathology and Clinical Biochemistry, Queen Mary Hospital

Academic staff work closely with the Chief of Service and professional staff in the Department of Pathology and Clinical Biochemistry of Queen Mary Hospital to provide a comprehensive range of College of American Pathologists accredited diagnostic laboratory service in Anatomical Pathology, Clinical Biochemistry, Clinical Immunology, Haematology, and Transplantation & Immunogenetics, which are the 5 Divisions of the Hospital Department. The hospital staff includes 7 Consultants, 6 Associate Consultants/Senior Medical Officers, 7 Resident Trainees and 10 Scientific Officers. The Hospital also funds a number of staff who are employed by the University and who also participate in clinical diagnostic services, including a Scientific Officer who works specifically in the area of developing and utilizing diagnostic molecular pathology tests. The Department was accredited by the Royal College of Pathologists of Australasia in 2013 as a training centre for Genetic Pathology, including Biochemical Genetics and Medical Genomics.

Anatomical Pathology Division

Head: Dr SHEK Wai-Hung Tony

The Anatomical Pathology Division provides services in surgical pathology, cytopathology and autopsy to Queen Mary and other hospitals in the Hong Kong West Cluster as well as other private and public hospitals in the territory on a referral basis. Pathologists with subspecialty training and interest are available for consultation on most organ systems. In 2013, it reported on 54,749 surgical specimens including 1,110 frozen section cases. In addition, 27,573 cytology specimens and 143 autopsies, including 112 Coroner’s cases, were handled. The clinical practice of Anatomical Pathology is supported by a general core laboratory and a number of special laboratories, including immunohistochemistry, electron microscopy, image analysis and molecular pathology. Like other divisions in the department, the Anatomical Pathology Division is also a certified training centre of the Hong Kong College of Pathologists, the Royal College of Pathologists of Australasia and the Royal College of Pathologists of the UK.

Clinical Immunology Division

Head: Dr CHAN Yuk-Tat Eric

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