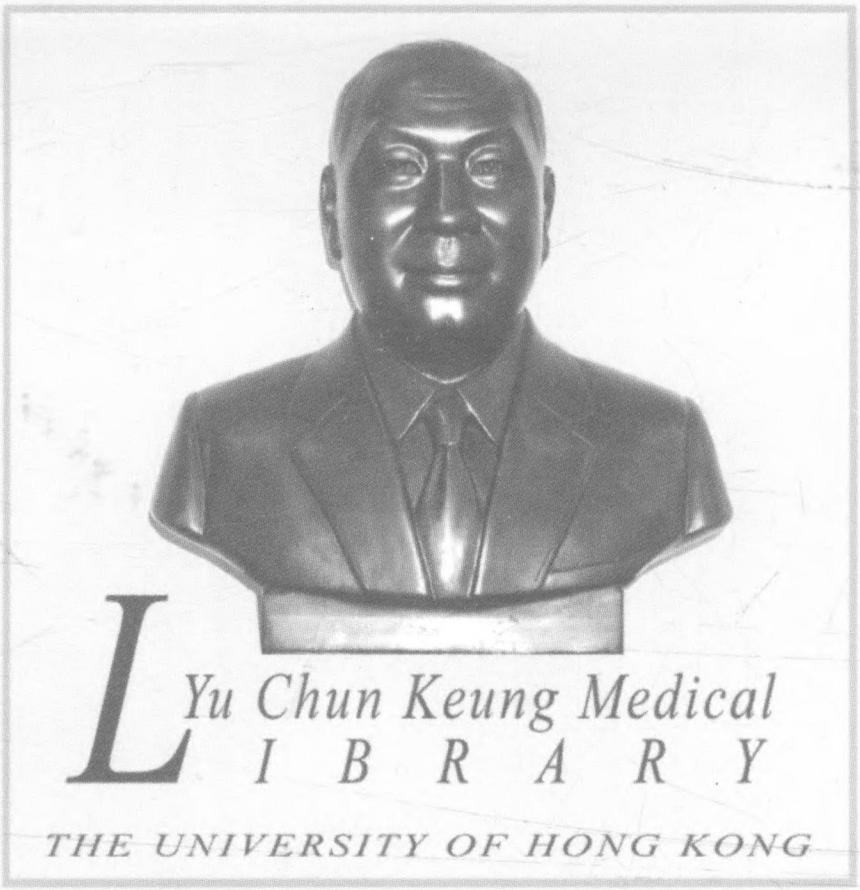
香港大學醫學院
Faculty of Medicine
The University of Hong Kong

世紀戰疫 – 傳染病研究
Fight Against Infectious Disease



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Dean's Message

傳染病跟香港有三重特殊關係。香港位處全球其中一個最擠迫的地區—華南，人類、禽鳥和牲畜都生活在同一個小地方，因而容易引發傳染病。此外，香港作為國際大都會，與世界各地皆有頻繁的交通往來，若有傳染病在本地爆發，有可能散播至其他地區。然而，香港擁有世界一流的研究實驗室，能夠迅速找到及辨認出病原，並追蹤其擴散情況。

其實，本地的醫學科研人員在預防傳染病方面，例如禽流感、「沙士」和肝炎等，均有出色表現。在二零零三年的「沙士」疫潮中，香港的科學家全球率先找到疫症的元凶為冠狀病毒，在一九九七年他們亦曾協助阻止禽流感在香港以至全球爆發。科研人員的驕人成就，正好展示醫學研究對預防傳染病的重要性。

有鑑於此，香港大學醫學院自創院以來一直十分重視傳染病的研究，我們第一屆的醫學院院長白文信教授更有「熱帶醫學之父」之稱。港大醫學院亦積極與世界級傳染病專家合作，包括法國巴斯德研究所、愛滋病專家何大一、流感專家Robert Webster等。我們很有信心，聯合研究的成果會使醫學界及市民對流行病學、致病原、治療、免疫和傳染病的預防等等有更深入的了解，使我們的社區能防患於未然。

我們希望透過這本小冊子，與社會各界分享我們的研究心得，加深市民對傳染病的認識，並繼續支持港大醫學院以科研守護香港。

香港大學醫學院院長林兆鑫

林兆鑫

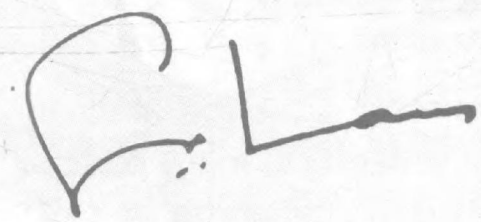
二零零四十月

Hong Kong is intertwined with infectious diseases in three unique ways. Its geography in South China is such that it is right at the centre of one of the most populated regions of the world, where human, poultries and farmed animals live in close proximity – a situation ideal for infectious microbes to disseminate and amplify. As an international city and with traffics linked extensively to the world, Hong Kong could spread an infection outbreak worldwide. However, its world-class research laboratories mean that the infectious agents could be picked up quickly and identified, and their spread checked in Hong Kong.

In fact, the local scientists have made ground-breaking discoveries in H5N1 influenza ("the bird flu"), SARS, hepatitis, etc. They identified SARS coronavirus as the primary agent causing the outbreak of atypical pneumonia in 2003, and helped Hong Kong and the world to avoid a bird flu outbreak in 1997. Their work shows that research is of paramount importance in combating infectious diseases.

Since its establishment, the Faculty of Medicine of the University of Hong Kong has been committed to excellence of research in infectious diseases. The first Dean of Medicine was Sir Patrick Manson who came to be known as "the Father of Tropical Medicine". Also, the Faculty has close collaborations with Institute Pasteur of France, and internationally renowned scholars such as AIDS expert, Dr. David Ho, and influenza expert, Professor Robert Webster. We are confident that the project of joint research will benefit the community of Hong Kong and mankind as a result of the enhanced understanding of epidemiology, pathogenesis, treatment, immunization and prevention of infectious diseases.

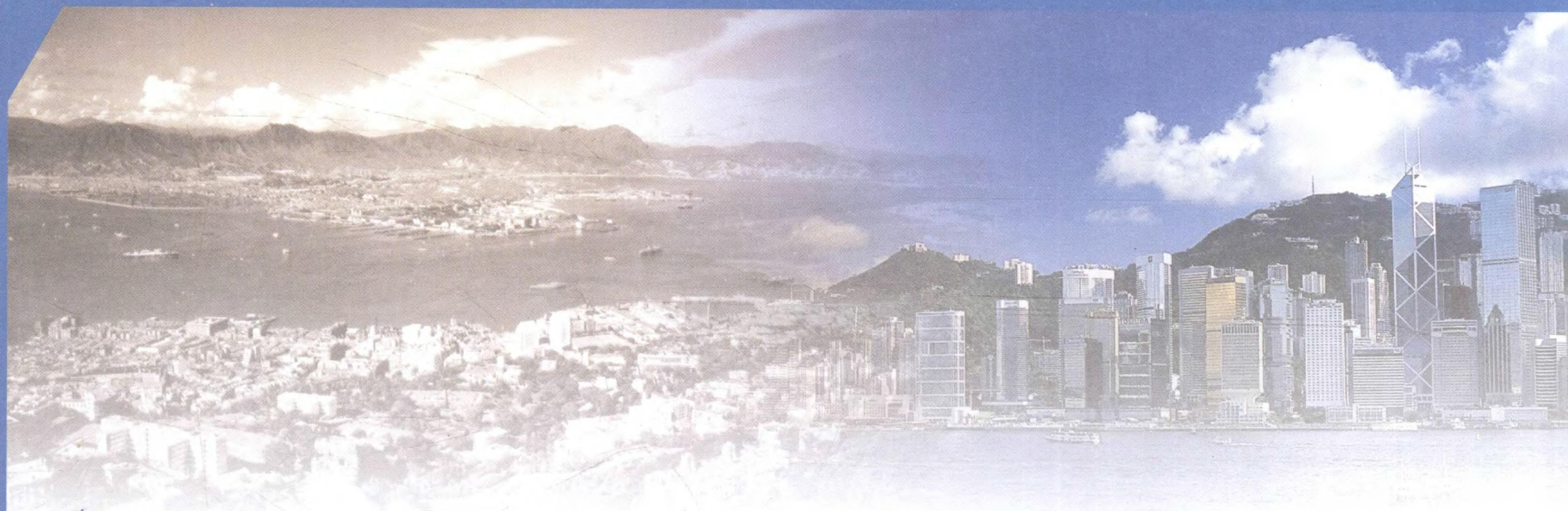
It is hoped that this booklet can raise the public awareness in infectious diseases. With the support from the community, we will continue to safeguard Hong Kong people's health by medical research.



Professor S.K. Lam
Dean, Faculty of Medicine
The University of Hong Kong

October 2004

傳染病在香港
Infectious Diseases in Hong Kong



自古以來，傳染病一直威脅人類的健康和生命，今天世界上仍有很多人飽受傳染病折磨。相信香港市民對九七年間在本土爆發的H5N1禽流感，和二零零三年的非典型肺炎猶有餘悸。同時，有十分之一的香港人是乙型肝炎帶菌者，病情有可能演變為慢性肝炎、肝硬化和肝癌。可見傳染病的威脅實在不容忽視。

Infectious diseases have plagued mankind since the antiquity and are still major causes of death and suffering in many parts of the world. The close encounter with H5N1 influenza in 1997 and SARS outbreak in 2003 had been a dreadful experience. At the same time, about one tenth of the population of Hong Kong is chronic carriers of hepatitis B virus infection and hence is at high risk for the development of chronic hepatitis, cirrhosis and liver cancer.

香港突發性傳染病的歷史
History of Emerging Infectious Diseases in Hong Kong

1894	鼠疫 Plague
1963-64	霍亂 Cholera
1968	全球性流感 Influenza H3N2
1997	禽流感 Influenza H5N1
2003	非典型肺炎 SARS

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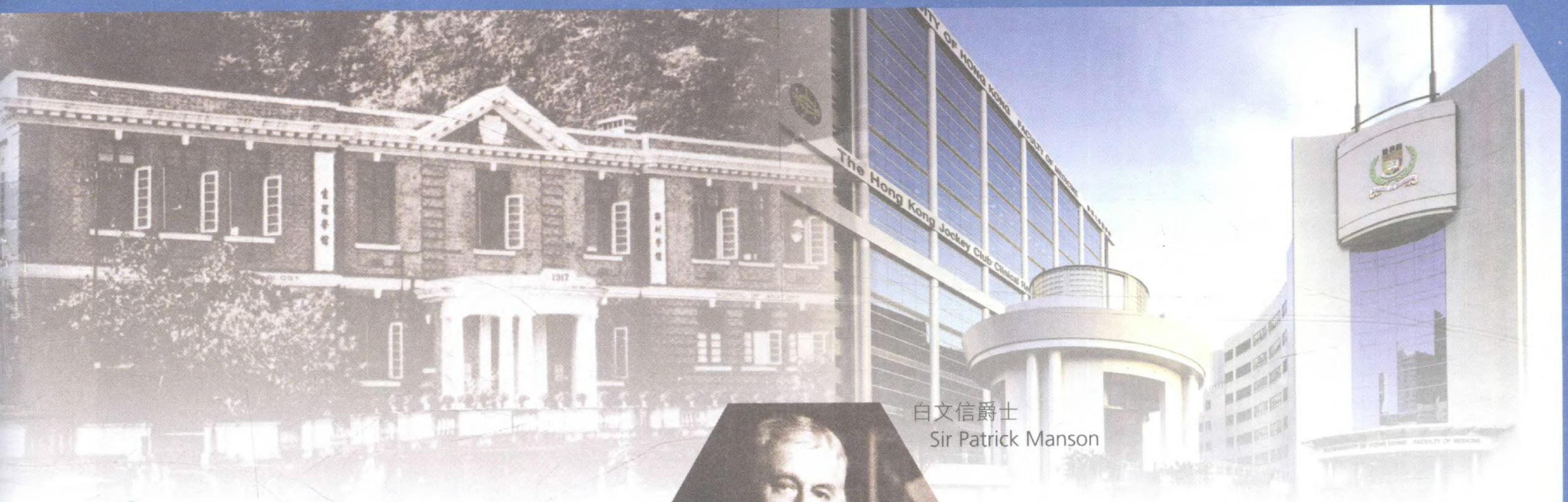
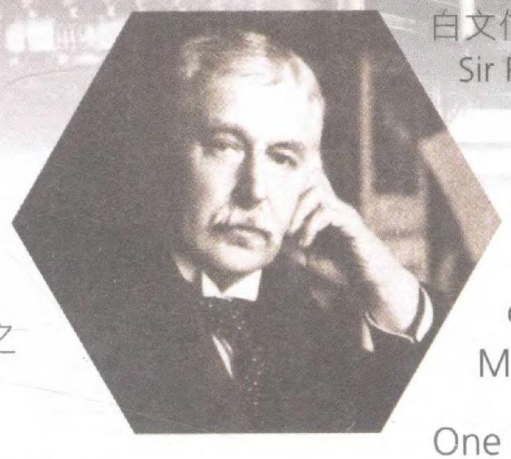




白文信爵士
Sir Patrick Manson

香港大學醫學院進行傳染病研究已有多年歷史，成果備受本地、區內及國際重視。醫學院的前身是香港西醫書院，首任院長正是被譽為「熱帶醫學之父」的白文信爵士。

醫學院的研究著重配合社會需要。作為亞洲區具領導地位的大學，香港大學致力追蹤在香港及區內出現的傳染病，對瞭解疾病和協助政府制訂政策，貢獻良多。

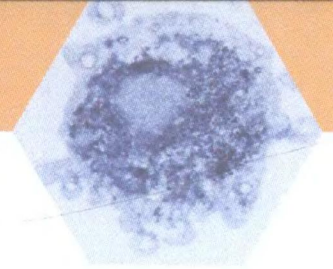
港大將會繼續匯聚專業知識，進行醫學研究，竭盡所能對抗傳染病的挑戰。

Research in infectious diseases has been carried out in the Faculty of Medicine, the University of Hong Kong for many years. Findings that have local, regional, or even international significance were made repeatedly. The first Dean of the Hong Kong College of Medicine (from this College the Faculty was created), was Sir Patrick Manson who came to be known as "the Father of Tropical Medicine".

One key feature of Faculty of Medicine's research is the emphasis on "relevance" to Hong Kong and the region. Being one of the most reputable universities in Asia, the University of Hong Kong has contributed significantly to the detection and tracking of locally and regionally important infectious diseases, hence contributed immensely to the understanding of infection diseases and helped the Government in formulating health policies.

The University will continue to put together expertise in the research of infectious diseases, and hence contribute to more effective control of infectious diseases.

突發性傳染病
Emerging Infectious Diseases

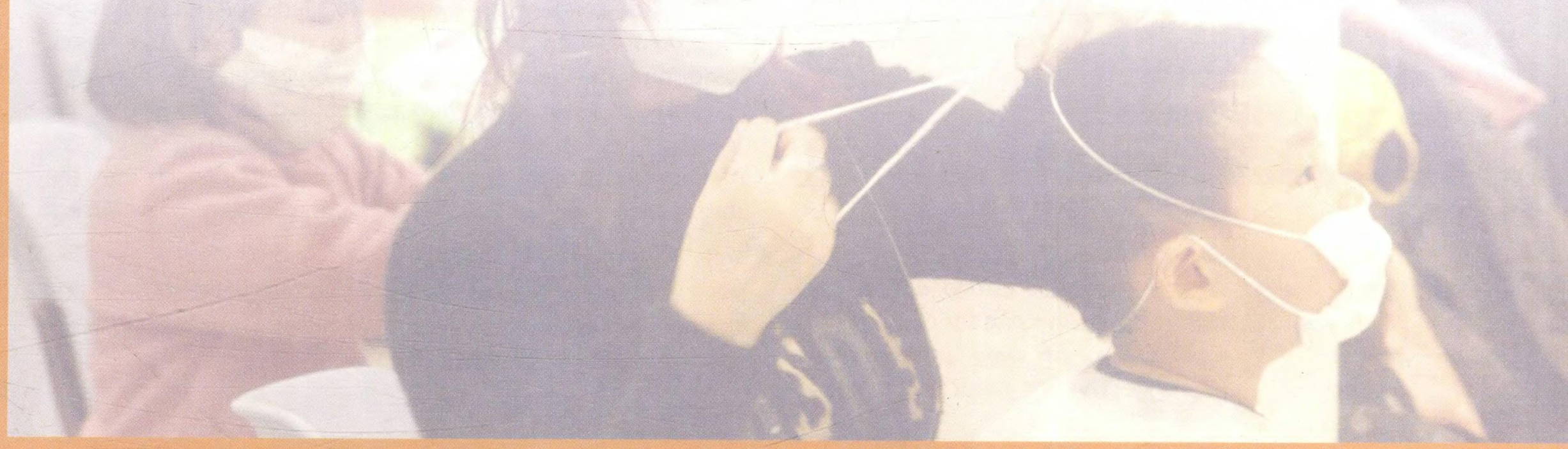


突發性傳染病是香港大學微生物學系的重點研究項目，希望透過偵察和追蹤香港及鄰近國家的傳染病，提高對傳染病的認識，並協助政府制訂公共衛生政策。為了預防突發性傳染病爆發，微生物學系除了研究病人的狀況以外，還對環境和動物進行監察，以預先找出有可能侵襲人類的新致病原。

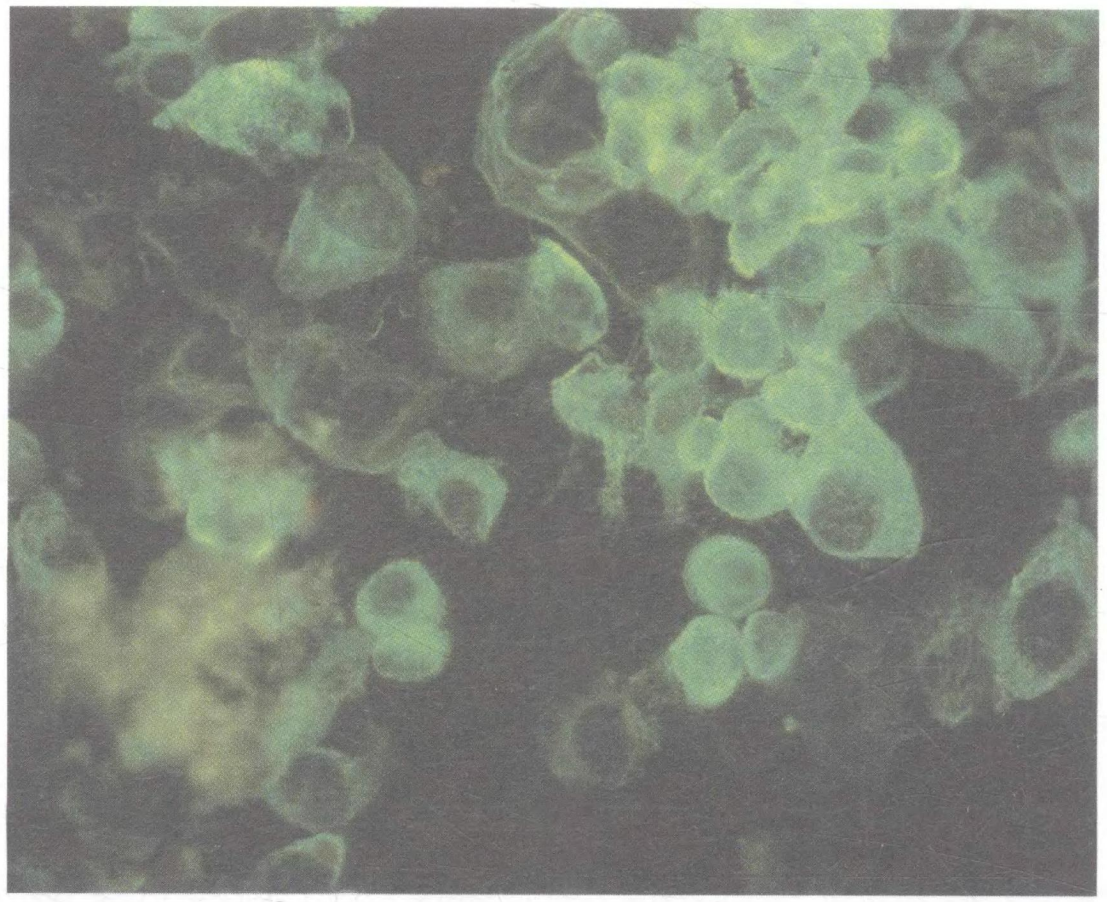
Emerging infectious disease is a key research area of the Department of Microbiology in the University of Hong Kong, which has been committed to the detection and tracking of infectious diseases in the region, so as to understand the epidemic and help the Government formulate health policies. To predict emerging infectious disease, researchers not only focus their research on patients, they also carry out environmental and animal surveillance so that the appearance of new pathogens can be detected before they infect human beings.

研究員 Investigators in-charge:

袁國勇 KY Yuen, 裴偉士 JSM Peiris, 管軼 Y Guan, 何栢良PL Ho, 胡釗逸 PCY Woo, 鄭伯建 BJ Zheng, 陳雄林 HL Chen, 劉嘉珮 SKP Lau, 黃世賢 SSY Wong, 潘烈文 LLM Poon, 高一村 RYT Kao, 微生物學系 Department of Microbiology



嚴重急性呼吸道綜合症 (簡稱「沙士」)
Severe Acute Respiratory Syndrome (SARS)



「沙士」冠狀病毒
SARS coronavirus

追蹤冠狀病毒

二零零三年三月，港大醫學院發現引發「沙士」的元兇是一種全新的冠狀病毒，為全球揭開「沙士」的神秘面紗。

在非典型肺炎的戰疫中，微生物學系系主任袁國勇教授設定研究方向，領導眾微生物學家各展所長，其中病毒組主管裴偉士教授專注研究基礎病毒學，而管軼博士和鄭伯建博士則集中研究動物病毒學。

初期研究人員曾懷疑引起疫潮的是H5N1禽流感病毒，管軼博士和鄭伯建博士隨即到廣州取得內地非典病人的組織樣本，證實病毒並非禽流感。樣本交給陳國雄博士以猴子腎細胞腺成功培植出「沙士」病毒，研究病毒基因的潘烈文博士藉以排出一小截病毒基因，微生物學系終於成功確定「沙士」是一種全新的冠狀病毒。

Tracking the virus

In March 2003, the Faculty attracted worldwide attention with the discovery of the primary agent causing the outbreak of atypical pneumonia, a virus now known as SARS coronavirus (SARS-CoV).

As the Head of Microbiology, Professor KY Yuen set the direction and underpinned the actions of his group of microbiologists, which ultimately led the Department to victory over SARS. Professor JSM Peiris focused on basic virology while Dr Guan Yi and Dr BJ Zheng on zoonotic virology.

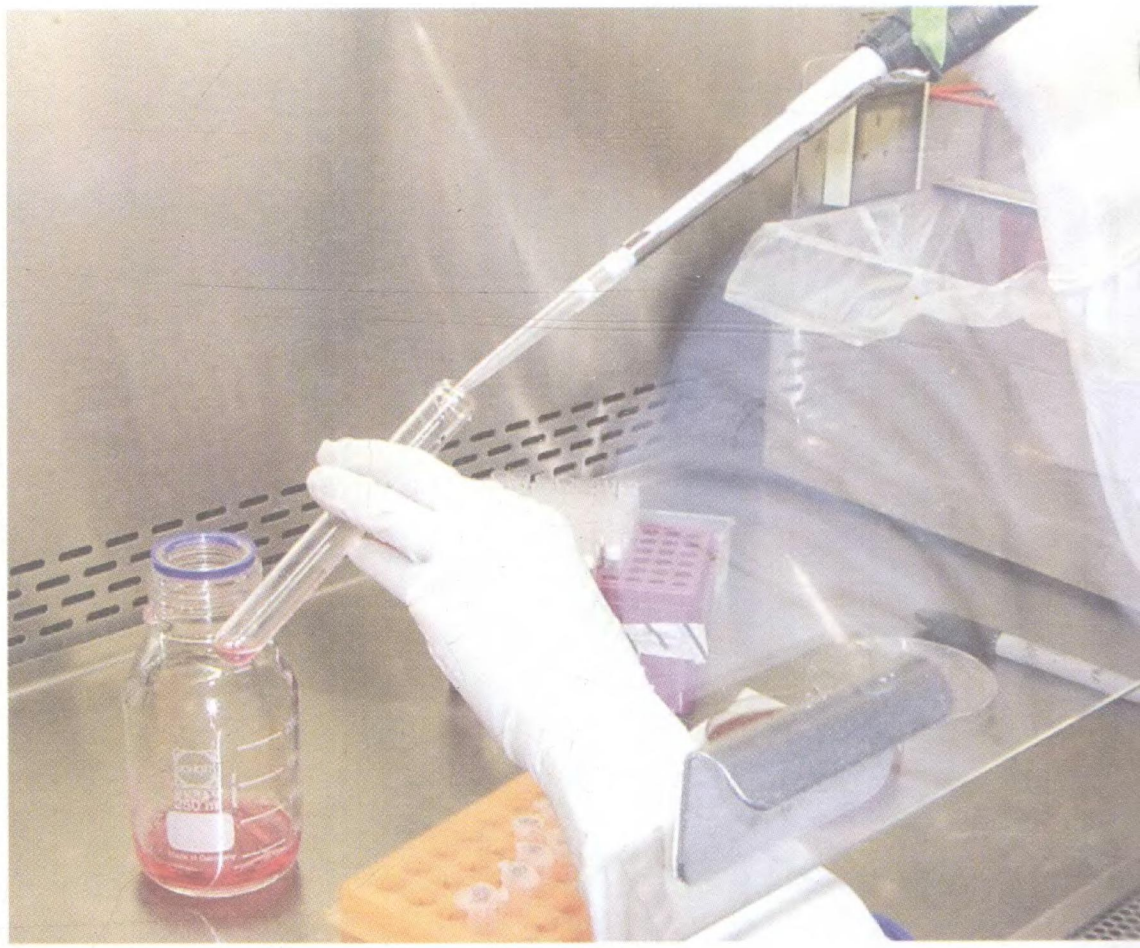
At first, H5N1 was suspected to cause the epidemic. Dr Guan and Dr Zheng went to Guangzhou to gather patient specimens, and discovered that the causative agent was not H5N1. Dr KH Chan then grew the virus in isolation and Dr LLM Poon isolated a fragment of the SARS gene. The team finally identified a new virus, SARS-CoV.

除此之外，醫學院在「沙士」研究上還有多項驕人成就：

A. 開發快速基因及血清測試
B. 觀察臨床病況變化
C. 發現糞便可能是感染途徑之一
D. 完成病毒的基因排序 (與港大理學院合作)
E. 建議抗病毒的藥物
F. 在果子貍等野生動物身上發現「沙士」病毒

阻止再度爆發

發現「沙士」冠狀病毒源自野生動物，對控制及預防「沙士」再度爆發有決定性的影響。研究顯示，在二零零三年底的四宗人類「沙士」證實個案中，病毒均源自食品市場中的野生動物。自廣東省在二零零四年一月銷毀所有市場中的野生動物後，就再無源自社區的新個案，可見此政策之成效，和尋找疫病源頭之重要。



The Faculty of Medicine has also pioneered other ground-breaking research into this new disease:

A. Rapid diagnosis of SARS-CoV pneumonia by genetic and antibody testing
B. Clinical description of the progress of SARS
C. Identifying faeces as one of the possible modes of transmission
D. Cracking the genetic sequencing of the SARS-CoV (collaborative study with Faculty of Science)
E. Advice on the effective therapeutic regimens for SARS
F. Finding the reservoir of the virus in wild animals including civet cats

Averted second SARS outbreak

The discovery that the human SARS-CoV was transmitted from wild animals is critical in controlling and preventing SARS outbreak in the future. Phylogenetic analyses suggested that SARS-CoV from the four confirmed human cases of SARS found in late 2003 were originated from wild animals in the markets. After removing all wild animals from food markets in January 2004, no new human case was found. Thus, the operation of culling civets and closing wild animal markets in Guangdong did remove the infectious source and averted another potential SARS outbreak.

醫學院最新的「沙士」研究進展
Recent efforts in the fight against SARS by the Faculty

A

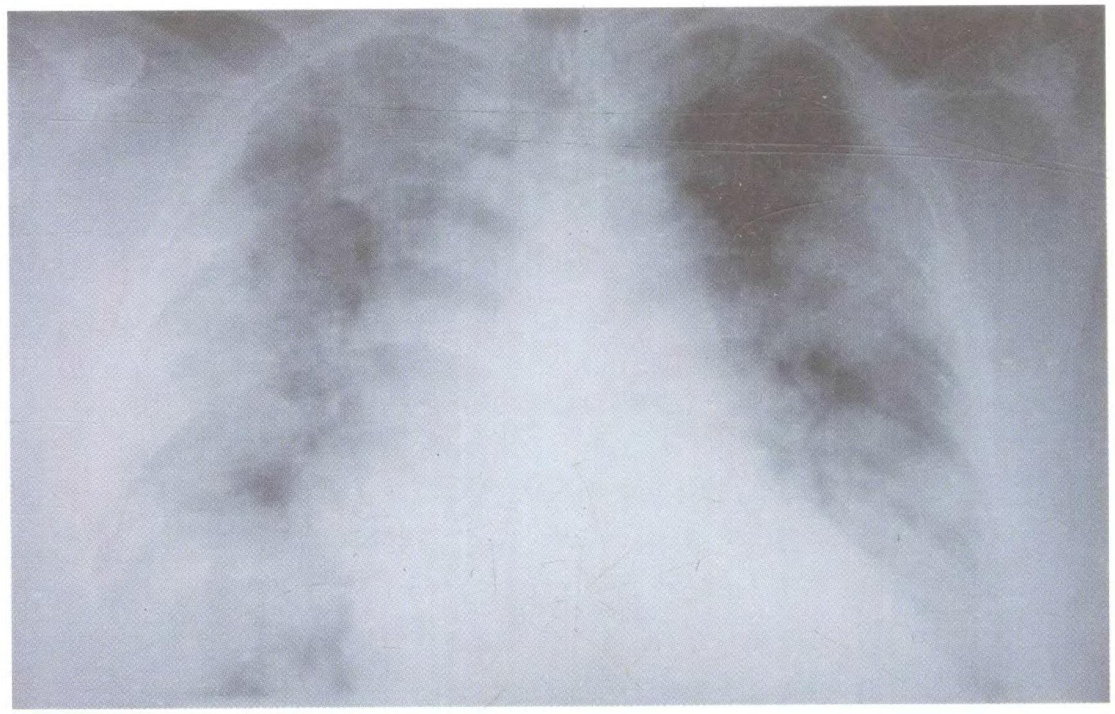
臨床研究

除了發現「沙士」冠狀病毒、開發快速測試、找出病毒的宿主和可能的傳播途徑，香港大學微生物學系更與醫院管理局的胸肺科及深切治療部的醫生進行多方面的合作，包括研究臨床描述、病情跟含病毒量和血清抗體的關係、抗病毒藥和觀察病人X光肺片的變化。這些研究結果對有效控制「沙士」非常重要。

在成功控制疫情後，研究人員並沒有鬆懈，繼續探索「沙士」的發病機理，如何在動物之間傳播，病毒基因的結構和非結構性組織，以及病毒在動物身上的致病性。這些重要的研究將有助開發更快更準確的診斷測試，發展安全有效的抗病毒藥物和免疫法。

Clinical Studies

Besides the discovery of the SARS coronavirus, development of rapid diagnostic tests, finding the animal reservoir and the possible portal of transmission, the team from the Department of Microbiology has collaborated with pulmonary physicians and intensivists of the Hospital Authority in the detailed clinical description of SARS, its clinical progression in relation to the viral load and serum antibody profiles, the antiviral therapy studies and the characteristic radiographic changes in SARS patients. All these findings have enormous importance in the successful control of SARS.



After the epidemic is under control, the team has geared up their effort in the understanding of the pathogenesis of this virus, the transmission dynamics in animals, the molecular dissection of the various structural and non-structural component of the virus using functional genomics and the pathogenicity in animal studies. All these studies have important implications in the future design of more rapid and accurate diagnostic tests, effective and safe antivirals and immunisation strategies.

B

改良診斷測試

港大微生物學系研製出較便宜簡便的「恆溫快速測試」。這個新方法毋須使用昂貴複雜的儀器，每次測試只需二十至三十元，成本遠較每次需要過百元的傳統方法為低，可協助發展中國家為病人進行測試，有助快速控制疫情。不過，新測試的研究仍屬於初步階段，港大將會繼續改善有關測試，以提升其的敏感度。

Improve diagnostic test

A rapid and simple diagnostic test for SARS, namely Loop-Mediated Isothermal Amplification Assay (LAMP test), has been developed. This new test can be performed with simple equipment. A single LAMP test costs $20 to $30 compared with traditional methods which cost at least $100, making it cheaper for developing countries to detect the disease quickly. The development of LAMP test is still in early phase. The University will continue to improve its sensitivity.

C

研製疫苗

研究人員正進行人和動物的「沙士」疫苗的研究，包括滅活疫苗、亞單位蛋白疫苗、DNA疫苗和減毒活疫苗的可行性。初步發現，滅活疫苗能阻止活病毒感染細胞，減低活病毒感染性達一萬倍。初步研究結果亦顯示，滅活疫苗能有效誘導抗「沙士」的免疫力。疫苗現正等候進行動物測試。

Vaccine development

The study focuses on development of vaccines for prevention of human SARS and animal SARS-like virus infection, including inactivated vaccine, protein vaccine, DNA vaccine and attenuated live vaccine. The initial study has found that the inactivated vaccine blocked the infectivity of the live virus for up to 10,000 times. Preliminary results suggest that vaccination can induce protective immunity against SARS virus infection, but it needs to be confirmed by animal studies.

治療藥物

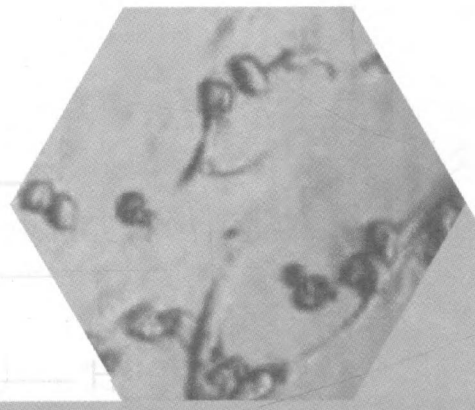
港大採用「高通量篩選法」檢驗了五萬種結構不同的小分子化合物，篩選出百多個能抑制「沙士」病毒活動的小分子，有潛質發展為治療藥物。

另一方面，小分子干擾性RNA是一種遺傳物質，在插入病毒基因後，可以抑制病毒的複製與表達。港大製造了一些與「沙士」病毒的各種基因相配的小分子干擾性RNA，並在細胞層面証明了，其中一些能有效抑制「沙士」病毒感染和複製達百分之九十至九十九。但如何有效地把小分子干擾性RNA轉介到人體細胞，仍是臨床應用的一個難題，港大將繼續進行這方面的研究。

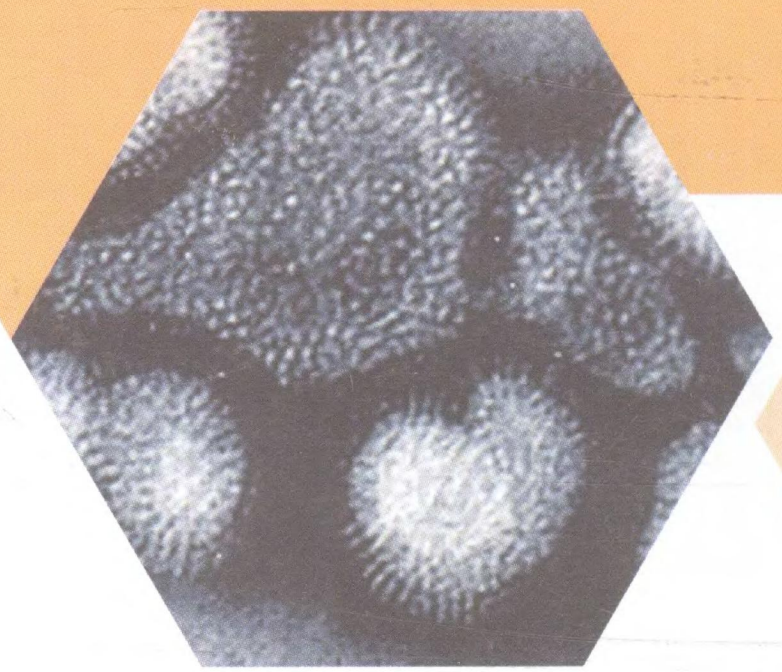
Possible antiviral drugs for treatment

A high-throughput screening platform has been established and it has screened more than 50,000 structurally diverse small molecule compounds for anti-SARS-CoV activities in a cellular model. The study led to the identification of a reservoir of one hundred potent inhibitors targeting various components of SARS-CoV, providing a novel group of potential leads for anti-SARS drug development.

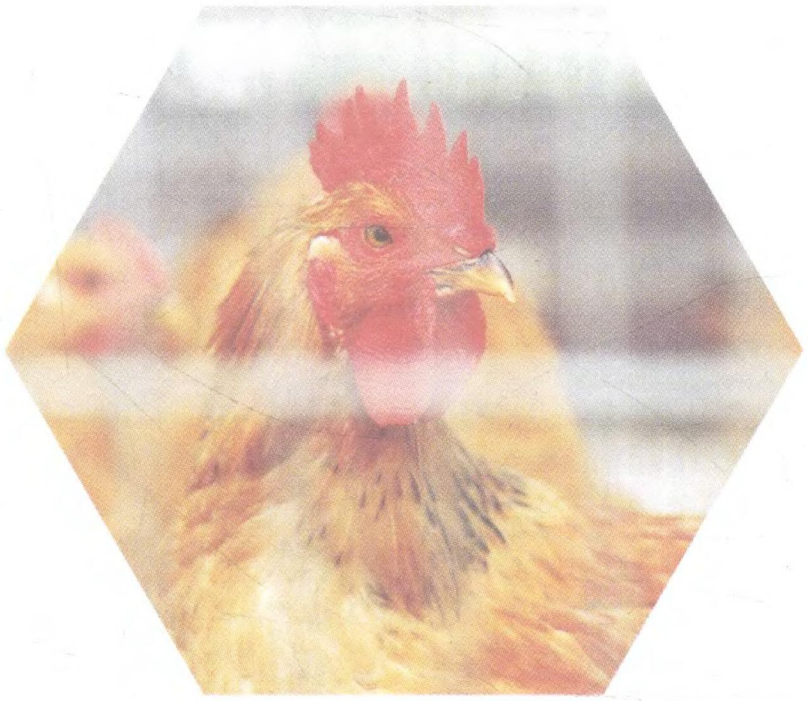
On the other hand, the small interfering RNA (siRNA) duplex has been proven to be a potent agent for knocking out gene expression in mammalian cells through mRNA disruption. SiRNAs has been designed targeting on different genes of SARS-associated cornavirus and demonstrated that some of these siRNAs are able to reduce SCoV infection and replication by 90-99%. However, the delivery of siRNA is still a major technical challenge for clinical application, researchers will continue to pursue in this area.



禽流感
Avian influenza



禽流感病毒 Bird flu virus



自一九九七年禽流感首次在香港出現以來，港大醫學院一直與香港政府合作進行有關研究，包括鑒定病毒來源、傳播途徑、基因排序及變化、人類發病的原因、實驗技巧和研製預防疫苗。研究成果有助政府制訂公共衛生政策，例如休市清潔日、家禽用疫苗、食品市場監控、農場的生物安全措施等。港大與政府的合作，有助追蹤傳染病的出現，以便即時採取相應措施防止疫情擴大。在二零零四年初，亞洲大部分國家都出現禽流感個案，香港卻能幸免於難，可見本港防疫措施的成效。此外，港大的微生物學家亦為世界衛生組織提供專家意見，協助研究在東南亞出現的禽流感。

禽流感的源頭

在二零零二年至零四年間，汕頭大學醫學院與香港大學醫學院的聯合流感研究中心，及其他六個機構合作，進行H5N1禽流感的研究。研究顯示，禽流感已成為東亞地區的風土病。家鴨作為流感病毒的自然宿主，在H5N1禽流感病毒的演變過程中起著關鍵性作用，一些對人類有威脅的新病毒仍然不斷在家鴨中衍生。而野生禽鳥很可能是傳播H5N1至其他地區的媒介。科學界需要透過長遠的監測措施及進行病毒基因排序，以及早找出引致禽流感爆發的病毒種類。

Since 1997, Faculty of Medicine's researchers, in collaboration with the HKSAR Government, have worked on bird flu research, which includes identifying the source of the virus, how and why it is spreading in this region, genetic sequencing of the virus for understanding how the virus is changing, understanding why the H5N1 virus causes such severe disease in humans, and also laboratory techniques and vaccine development.

The research results have helped the Government in formulating public health policies, such as the introduction of rest day for poultry retail outlets, vaccination for poultry, surveillance in markets and setting up of biosecurity measures in farms.

The collaborative efforts between the University of Hong Kong and the government help to detect infection before mass dissemination and this has facilitated the introduction of protective measures. In early 2004, while bird flu outbreaks occurred in many countries in Asia, Hong Kong remained free from this epidemic. This shows that the interventions made by government based on scientific research are effective. Also, microbiologists of the University have been consultants to World Health Organization in investigating H5N1 outbreak in Southeast Asia.

Origin of avian influenza

Between 2000 and 2004, a study has been conducted under the auspices of the Joint Influenza Research Centre of Shantou University and the University of Hong Kong, together with six other collaborating institutes. The results suggested that domestic ducks, which form the major influenza gene pool in southern China, played a central role in the maintenance and genesis of H5N1 influenza viruses. The findings also suggested that new influenza viruses that may pose a threat to human continue to be generated from ducks, although wild birds may be involved in spreading the disease over large areas. Through long term surveillance and genetic analysis, scientists will be able to quickly identify the H5N1 strain causing outbreaks in poultry and fatal disease in human.

photo provided by Agriculture Fisheries and Conservation Department

流行性感冒 Influenza

流行性感冒（簡稱流感）是常見的呼吸道疾病。在香港全年均有流感出現，以二月、三月、七月及八月最為常見。流感病毒會發生基因突變，衍生新品種，造成新一輪疫潮。

港大領導研究禽鳥、動物及人類的流感多年，研究的範圍包括相關的生態學、分子演變及流行病學、不同種類動物間的互相傳染、疫苗、免疫與病理、病毒與細胞的互動、診斷方法、疾病所致的壓力和經濟負擔。

國際流感權威Robert Webster教授將與港大合作，在香港建立一所「流行性感冒研究中心」。這個中心將建基於港大醫學院現有的流感病毒研究計劃，利用香港的地理優勢，研究及觀察禽流感在南中國的發展。

Influenza is an acute febrile illness mainly affecting the respiratory tract. It presents in Hong Kong all year round and is especially common in February, March, July and August. Frequent mutation of the virus's genes leads to the emergence of new subtypes that are responsible for epidemics or pandemics.

The University of Hong Kong has been at the forefront of research into the epidemiology of influenza viruses, avian, animal and human for many years. Researchers conduct research on the ecology, molecular evolution and epidemiology of animal and avian influenza, inter-species transmission, vaccine development, immuno-pathogenesis and viral macrophage interactions, diagnostic methods and disease burden and health economics of human influenza

Professor Robert Webster, Professor at the St. Jude Children's Research Hospital and an authority in influenza, has agreed to collaborate with the University of Hong Kong on the establishment of an Influenza Centre based in Hong Kong. This joint venture will build upon the existing Influenza Virus Research Programme at the Faculty of Medicine and make use of the strategic location of Hong Kong for epidemiological surveillance and research on avian influenza in South China.

愛滋病 AIDS/HIV

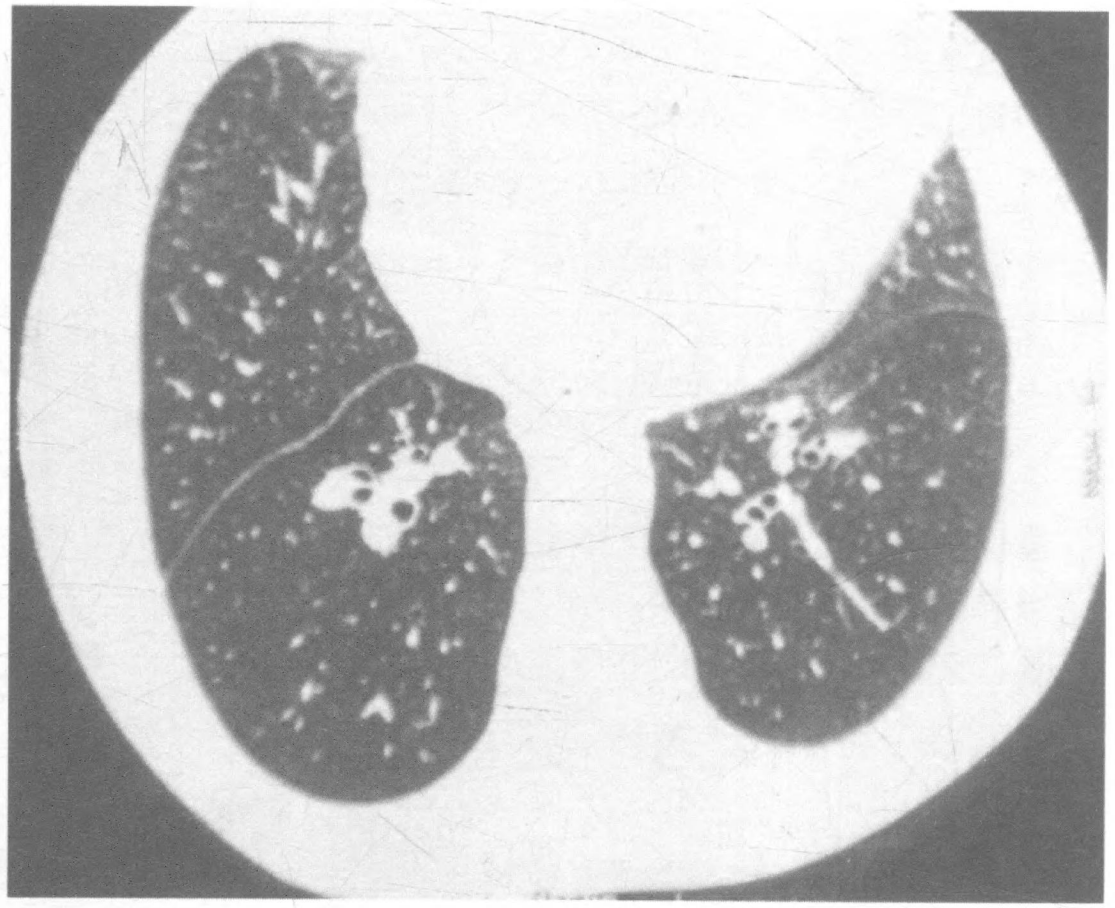
愛滋病的學名是「後天免疫力缺乏症」，患者體內的免疫系統受到愛滋病毒（學名為「人體免疫力缺乏病毒」）的損害。愛滋病毒破壞為人體抵抗病菌入侵的白血球。一旦白血球數量不足，人體的免疫能力就會被削弱，無力抵抗周遭環境中的致病原，因而併發其他感染。本來對正常人威脅不大的疾病也會變得致命。

港大醫學院成立了「愛滋病研究中心」，目標是協助控制亞洲區的疫情。研究中心進行愛滋病毒的基礎研究和應用研究，開發新療法和疫苗，為中國以至全球謀福祉。

AIDS stands for "Acquired Immunodeficiency Syndrome" which is an infection caused by HIV, the "Human Immunodeficiency Virus". The virus attacks human's white blood cells, which are the lines of defence against diseases and infections. When the body's immune system and its ability to repair damage becomes weakened, certain diseases which cause few problems in normal people become life-threatening to HIV infected patients.

The University of Hong Kong established the AIDS Institute with the objective of preventing the extension of the epidemic in Asia. The Institute conducts basic and applied research on HIV, creates and designs new therapies for the infection and develops AIDS vaccines for China and the world.

支氣管擴張 Bronchiectasis



Bronchiectasis is a common respiratory disease in Hong Kong though there is currently no effective treatment. Affected patients have permanently dilated airways, and they chronically produce sputum, cough up blood and continue to deteriorate. Although bronchiectasis is considered uncommon in the West, it is very common among the Orientals.

Treatment of bronchiectasis with anti-inflammatory and immunomodulating drugs

The Department of Medicine has pioneered the use of inhaled steroid and low dose erythromycin therapy, which are anti-inflammatory and immunomodulating drugs for these unfortunate patients. Apart from undertaking clinical trials, basic laboratory research is also done on bronchiectasis to try to understand the pathogenesis of bronchiectasis. It is aimed to design effective novel treatment in the future.

這是香港常見的呼吸道疾病，但暫時未有有效的治療方法。患者的氣管長期擴張而且多痰和咳血，病情更會持續惡化。支氣管擴張普遍流行於東方人，在西方則較少見。

消炎及免疫調節治療

港大內科學系率先使用吸入性類固醇和低劑量紅黴素，為病人進行消炎和免疫調節治療。除了臨床試驗外，港大亦進行實驗室研究，以瞭解支氣管擴張的病理和成因，從而開發治療的方法。

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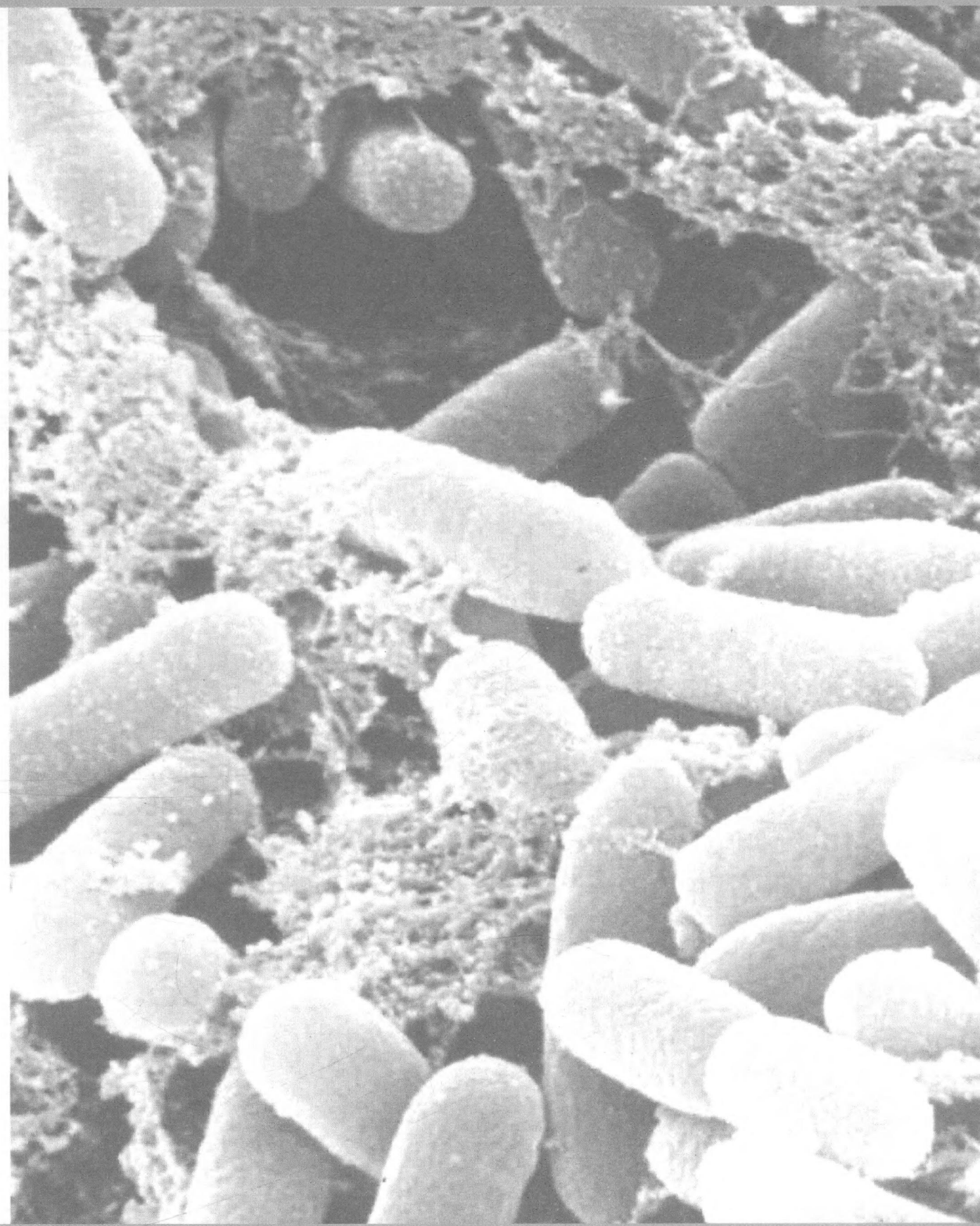
痰內細菌

對於病情持續加劇的患者，醫生必須確定他們痰內細菌的類別，才能進行有效的治療。港大醫學院發現，肺功能弱和多痰(即每天產二十毫升)的患者，很多都受到綠膿桿菌感染。而其他支氣管擴張患者，則多數受流感嗜血桿菌感染。這項發現能幫助醫生在治療初期，為病人處方適當的抗生素。

Sputum pathogens in airway infection

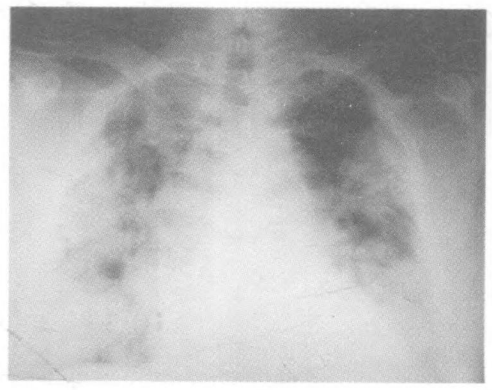
It is important to be able to predict the identity of bacterial pathogen in the sputum of patients with bronchiectasis, so that antibiotics can be prescribed scientifically for patient with exacerbations. The Faculty of Medicine has identified that patients with poor lung function as well as those with a lot of sputum production (e.g. more than 20ml daily) are likely to harbour *Pseudomonas aeruginosa* while the others are likely to have *Haemophilus influenzae*, thus helping doctors select the correct antibiotics in the early phases of treatment of bronchiectasis exacerbation.

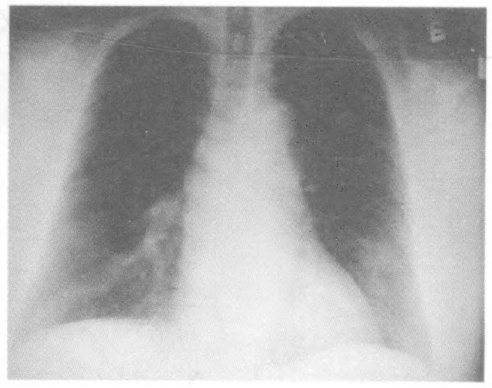
研究員 Investigators in-charge:
曾華德 KWT Tsang, 內科學系 Department of Medicine;
何栢良 PL Ho, 微生物學系 Department of Microbiology



痰內的細菌 sputum pathogens

肺炎 Pneumonia





肺炎是指肺部發炎，通常由微生物包括細菌、病毒、真菌等引起。一般分為醫院感染的肺炎及社區感染的肺炎，以後者較為常見。

Pneumonia is lung infection caused by bacteria, virus or fungus. Cases can be divided as hospital-acquired pneumonia and community-acquired pneumonia, while the latter is more common.

肺炎的治療

社區感染的肺炎在亞太區十分常見，而引起感染的細菌又跟在西方的不同。因此有必要找出及描述在亞洲和香港引起感染的細菌，以選擇合適的抗生素為病人治療。港大近期的研究發現，香港有百分之十一點三的社區感染的肺炎是由衣原體感染引起，百分之三點二由肺炎支原體感染引起，百分之一點六由肺炎軍團菌引起。港大期望與區內其他研究機關合作，開發更先進的療法

Treatment of community-acquired pneumonia

Community-acquired pneumonia (CAP) is a very common condition in the Asian Pacific region. The germs causing pneumonia appear to be different from those in the West thus making it important to carefully delineate those causing CAP in Asia and Hong Kong in order that the correct antibiotics are used to treat patients with CAP. The University of Hong Kong's recent research shows that patients with CAP are affected by *Chlamydia pneumoniae* (11.3%), *Mycoplasma pneumoniae* (3.2%) and *Legionella pneumophila* (1.6%) in Hong Kong. It is hoped to formulate, along with colleagues in this region, sensible antibiotic treatment for patients with pneumonia.

「沙士」臨床診斷

要有效控制疫症擴散，必須盡早為疑似個案進行診斷，並將患者隔離。港大內科學系建立了一個計分制，計算內容包括:曾否與病人接觸、胸肺X光片顯示的惡化速度、疼痛、白血球數量和肝霉的上升度。這個準則的敏感度高達百分之九十八，能辨別「沙士」疑似個案。

Clinical and bedside diagnosis

The control of SARS requires early diagnosis and prompt isolation of all suspected cases. The Department of Medicine has developed a scoring system which makes use of the presence of proof of contact with a patient, rapid deterioration in chest x-ray appearances, aches and pains, low lymphocyte (white cell) count, and elevation of liver enzymes. This prediction rule is 98% sensitive and should be useful for all health care workers dealing with potential SARS patients.

研究員 Investigators in-charge:

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Department of Medicine;
何栢良 PL Ho, 微生物學系
Department of Microbiology

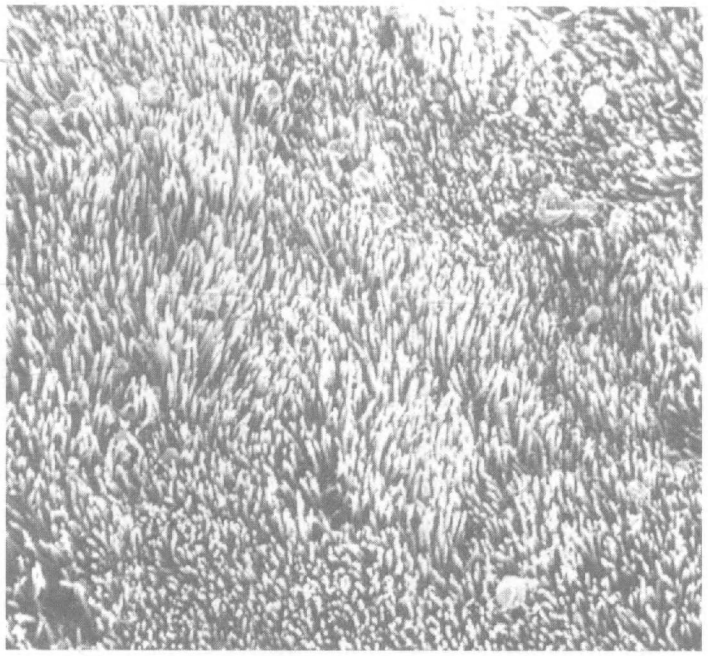
其他呼吸系統感染研究
Other research on respiratory infection

纖毛對吸入病菌的抵抗功能

纖毛是長在氣管黏膜表面的微細毛狀組織，每秒擺動十至十八次，幫助保持肺部清潔。如果纖毛活動減緩，呼吸時吸入肺部的廢物無法被清除，會引致肺部經常受感染。港大能運用特別的光和電子顯微鏡，分析纖毛的功能和結構，是全球少數掌握這個技術的研究機關之一。研究結果顯示，肺部長期受感染的病人很多都有纖毛異常的現象。研究亦發現了其他前所未知的纖毛功能缺陷。

Respiratory cilia and defence of airways against inhaled pathogens

Cilia are minute hair-like structures present on the surface of airway and beat continuously at 10-18Hz to keep the lungs sterile. As people inhale large volume of potentially contaminated air every day and need to remove waste from the lungs, ciliary dysfunction would be associated with frequent or even persistent infection of the lungs. The University is one of the few units in the world which has capabilities to evaluate ciliary function as well as structure, using special light as well as electron microscopes. This research has revealed that abnormalities of cilia are very common in patients with persistent infection, and have identified several defects not known previously.



氣管表面的纖毛

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GL Tipeo, 解剖學系 Department of Anatomy

慢性阻塞性肺病

慢性阻塞性肺病是香港以及整個亞洲常見因吸煙而引起的呼吸道疾病。患者經常咳嗽及多痰，亦會有氣速及急性病發的危險。為了更深入明白氣管感染及細菌長期存在的原因，港大的研究員和本港很多肺科醫生合作，希望透過收集資料及痰液的研究，找出新的治療方法。

Chronic Obstructive Pulmonary Disease

Chronic Obstructive Pulmonary Disease is a common disease among smokers in Hong Kong and Asia. Patients regularly produce sputum and cough. Some patients suffer from shortness of breath and acute attacks. The University's researchers, in collaboration with leading physicians in other parts of Hong Kong, have looked into the factors leading to persistent infection of the airways among these patients.

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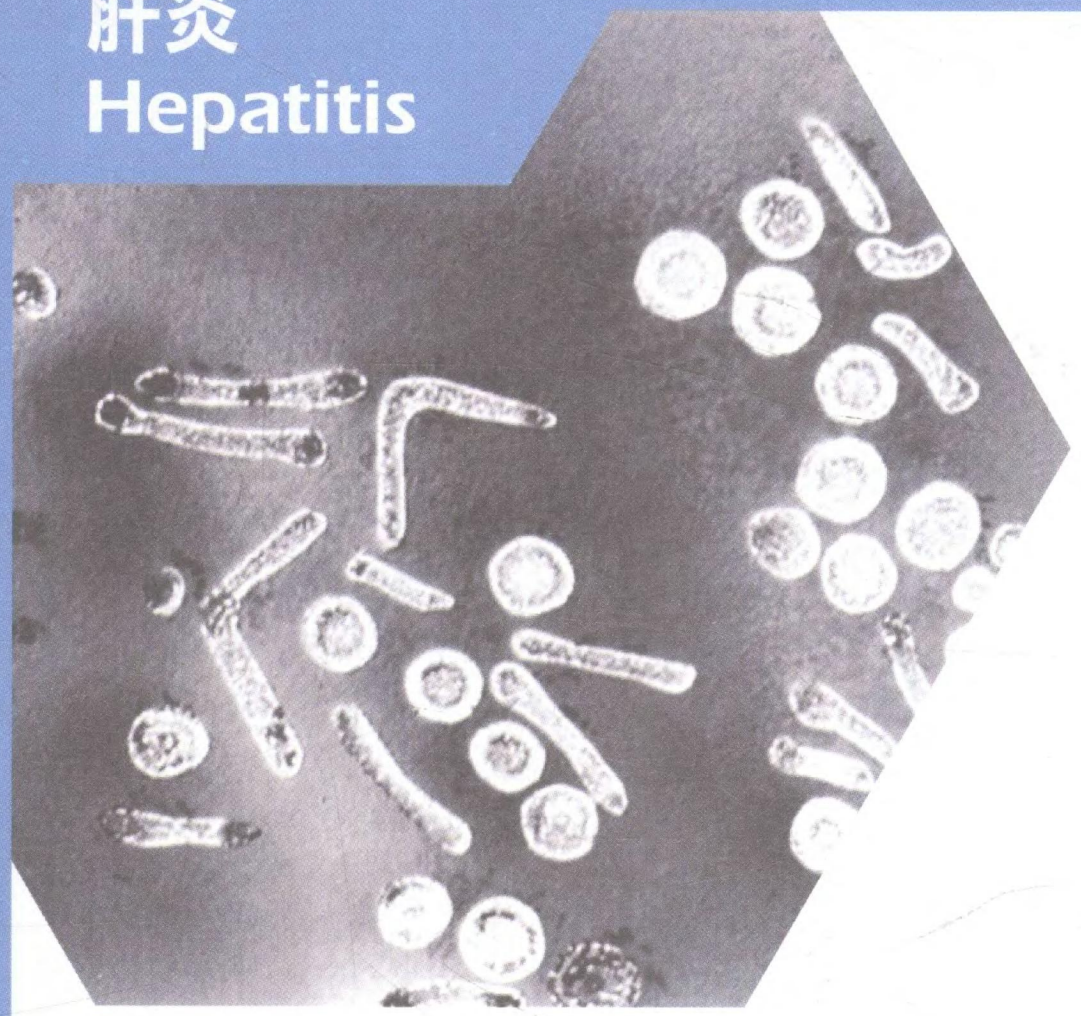
何栢良 PL Ho, 微生物學系 Department of Microbiology

肝炎
Hepatitis



慢性乙型肝炎是最為人關注的病毒性傳染病之一。全球約有四億人為帶病毒者，其中有四分之三是華人。

醫學院內科學系的肝病科自一九八零年起研究慢性乙型肝炎。研究發現，慢性乙型肝炎在病毒複製率不高的情況下，病情仍會惡化。因此，未來治療慢性乙型肝炎的方向，將會是加強及持續抑制病毒的活動。

醫學院率先研究以干擾素治療兒童病人，但發現此療法對華人帶病毒者並無長遠功用。醫學院繼而開發使用核甘酸類似物，為治療乙型肝炎帶來革命性的進展。「拉米夫定」是第一種註冊的有關藥物。在二零零零年，醫學院獲頒發「百時美施貴寶生物醫學研究資助 – 卓越傳染病研究獎」，表揚醫學院在研究慢性乙型肝炎的自然演進和治療上的成就。研究人員現正開發新一代更強的抑制乙型肝炎病毒的藥物，例如entecavir和telbivudine。

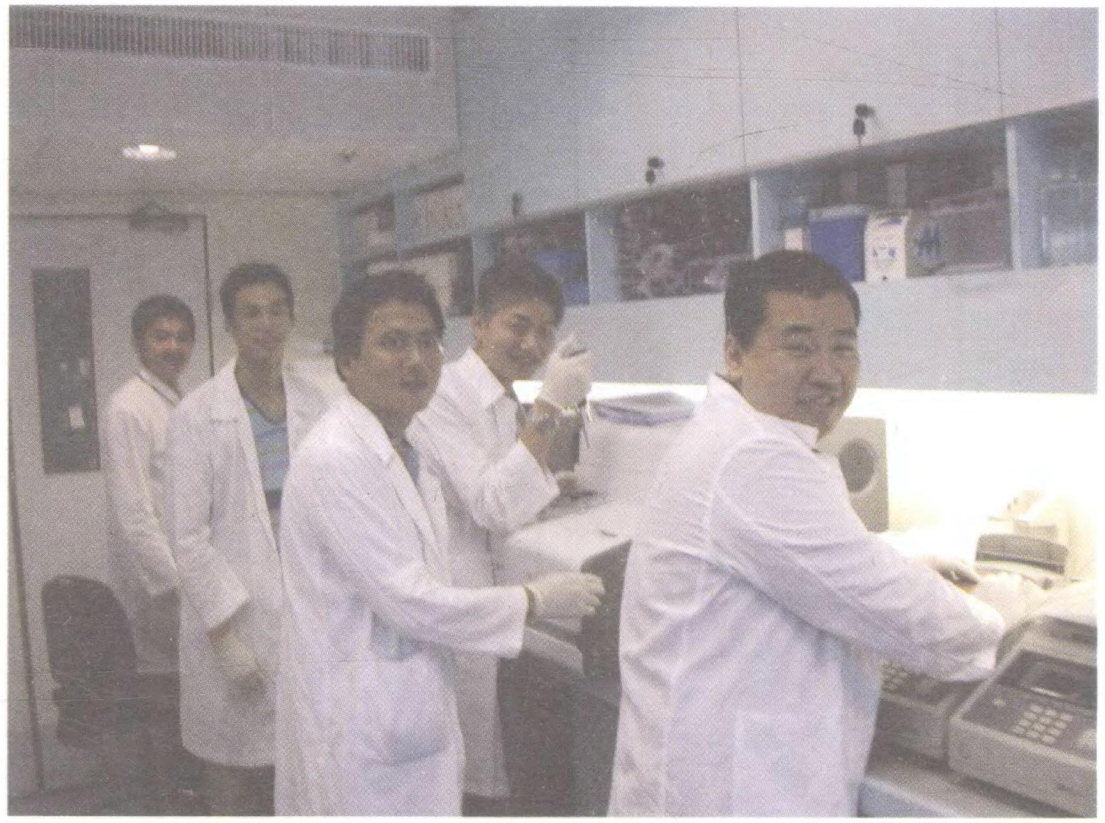
對付乙型肝炎的根本方法，是為新生嬰兒和兒童注射疫苗。在八十年代初期，當乙型肝炎疫苗剛開始測試時，醫學院已開始參予安排疫苗注射和測試，並且長期跟進已接受注射的兒童，觀察他們的免疫能力。研究發現，已接受乙型肝炎疫苗注射者，無須注射加強劑，仍能保持免疫能力，相信這是與人體免疫系統的記憶功能有關。

Chronic hepatitis B infection is of global importance, affecting 400 million people. It is of special importance in China since 75% (300 million) of the hepatitis B carriers in the world are Chinese.

The hepatologists of the Faculty of Medicine has been investigating various aspects of chronic hepatitis B infection since 1980. In the natural history of chronic hepatitis B, it was realized that the disease may continue to progress at moderately low level of viral replication. So future treatment should aim at maximal and continual suppression of the virus through out life.

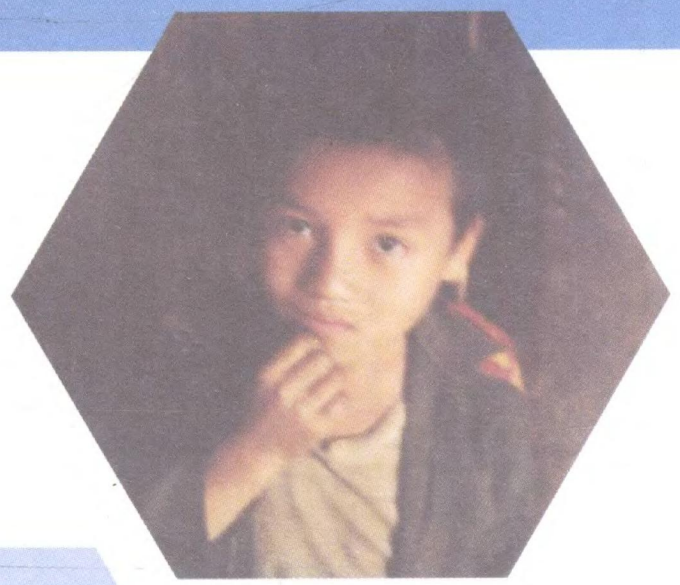
The Faculty pioneered studies of interferon treatment in children. It was found that interferon treatment is of no long-term benefit in Chinese hepatitis B carriers. The Faculty then played a key role in establishing the use of nucleoside analogues in carriers. This new type of therapy has completely revolutionized the treatment of hepatitis B. The first such drug to be licensed was lamivudine. For the distinguished work done in the investigation of the natural history and treatment of chronic hepatitis B, the Faculty was awarded the Bristol-Myers Squibb Unrestricted Biomedical Research Grant for Distinction in Infectious Diseases in 2000. The Faculty is currently investigating a few even more potent nucleoside analogues such as entecavir and telbivudine.

The ultimate way to tackle hepatitis B infection is to vaccinate children and newborns. The Faculty had been involved in testing and planning for vaccination against hepatitis B since vaccines were first available for trials in the early 1980s. In a long-term follow-up of children who have been vaccinated, it is found that no booster dose is required for continued protection of the vaccine recipient, probably through the memory response of the human immune system.



研究員 Investigator in-charge:
黎青龍 CL Lai, 內科學系 Department of Medicine

乙型肝炎在中國內地
Hepatitis B infection in Mainland China



在中國，乙型肝炎感染是一個嚴重的威脅。由其併發症如肝硬化和肝癌引致死亡的人數每年超過五十萬。儘管其重要性，中國每年二千萬新生兒中，只有少於半數能夠接受全程乙肝疫苗接種。香港大學內科學系廖家傑醫生、香港大學醫學院院長林兆鑫教授、梁智鴻醫生及胡國興大法官，以及一些社會賢達，於一九九八年成立了程思遠（中國．國際）肝炎研究基金會。

基金會的目的是促進在中國與肝炎相關的研究、教育和預防。經過一番努力，基金會發起了「世代無肝炎」計劃，在中國農村地區開展與肝炎相關的教育及預防肝炎的工作（詳情請瀏覽: www.hepafree.org），並且製作了與乙型肝炎預防、流行病學及治療相關的教育短片，發放到國內不同的地方。

另外，基金會還開展了與慢性乙型肝炎預防和治療相關的研究，而且已晉身為全球慢性乙型肝炎免疫治療和聯合治療的重要中心。研究得到了國家科技部973計劃的資助。透過研究員的努力，聚乙二醇干擾素（普通干擾素經過改進）有機會成為慢性乙型肝炎治療的選擇。

另一方面，基金會組織了三次國際肝病會議，其中二零零四年舉辦的會議吸引了超過一千六百人前來參加，並收到五百多篇論文摘要。在過去的六年，基金會資助了超過二十名學者前往外地進行有關肝炎的研究。

In China, hepatitis B infection is a major health threat. Due to its complication, viz liver cirrhosis and liver cancer, hepatitis B infection causes an annual death toll of more than half-a-million. Despite its importance, each year, less than half of the 20 million newborns in China was fully vaccinated against hepatitis B. Dr George Lau (Associate Professor, Department of Medicine, the University of Hong Kong), Professor Shiu-Kum Lam (currently Dean of the Faculty of Medicine, the University of Hong Kong), Dr Che-hung Leong, The Hon Mr Justice Kwok-Hing Woo, and in conjunction with the community elite group, have founded the Cheng Si-yuan (China-International) Hepatitis Research Foundation in 1998.

The aims of the Foundation are to promote hepatitis-related research, education and vaccination in China. Through its activity, the foundation has advocated "Hepatitis-free generation" campaign, dealing with hepatitis-related education and vaccination problem in rural China (www.hepfree.org). Education video, relating to prevention, epidemiology and treatment of hepatitis B infection, has been produced and delivered to different part of the country where it is needed.

In addition, research activities aiming to improve the understanding in prevention and treatment of chronic hepatitis B infection has been implemented. Notably, it is world leading centre for the development of new form of immune therapy and combination therapy for chronic hepatitis B infection. The research activity has been supported by the prestigious 973 research grant by the China Ministry of Science and technology. Through the Foundation's effort, pegylated interferon (an improved version of interferon) will become the treatment of choice for chronic hepatitis B infection.

On the other hand, the Foundation has also organized three International Liver Congress. Indeed, the Year 2004 Congress has drawn a record-breaking attendance of over sixteen hundred participants (with over 100 internationally renowned faculties) and more than 500 abstracts submission. Over the past 6 years, the Foundation has sponsored more than 20 scholars to study hepatitis outside Mainland China.

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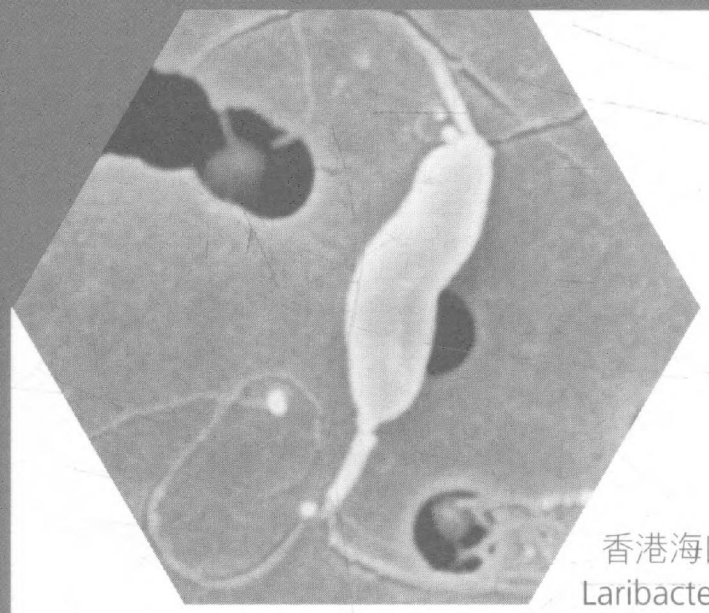
香港海鷗形菌
Laribacter hongkongensis



香港海鷗形菌
Laribacter hongkongensis

於二零零一年，香港大學感染及傳染病中心從一位肝硬化病者的血液和胸腔膿樣本中，發現了一種全新細菌屬，這是全球首宗有關個案。由於在顯微鏡下細菌的形態像海鷗呈彎曲狀，因此獲得命名權的港大醫學院微生物學系把它命名為「香港海鷗形菌」，以表揚本地研究人員的卓越成就。此後，研究人員陸續在患有腸胃炎的香港及瑞士病人的糞便樣本中培植出「香港海鷗形菌」。

在二零零四年，港大醫學院微生物學系在「香港海鷗形菌」的研究上再有突破性進展。研究人員在社區感染的腸胃炎病人糞便樣本中，培植出「香港海鷗形菌」，顯示這種病菌可能是引致嚴重腸胃炎的原因之一。感染原因可能是進食未煮熟的淡水魚，或與外出旅遊後出現的腹瀉有關。港大醫學院的研究人員下一步將進行病菌的基因排列，使醫學界對「香港海鷗形菌」的病理，如它何以會引致腸胃炎有更多認識，為設定治療及預防措施提供更多資料。

In 2001, the Centre of Infection of the University of Hong Kong discovered a new bacterium found in the blood of a cirrhotic patient with community-acquired infection resulting in pus formation in the pleural space. The bacterium was found to be a novel genus and species not previously described. The bacterium was named by the Department of Microbiology of the University of Hong Kong as *Laribacter hongkongensis*. *Lari* for its seagull-shaped appearance under the microscope; and *hongkongensis*, in honour of Hong Kong, the place where the bacterium was first discovered, and the place where the researchers were born, educated and lived. Since the announcement of this discovery, *L. hongkongensis* has been intensively sought in faecal specimens of patients with gastroenteritis. Some cases were found in Hong Kong and some in Switzerland.

In 2004, the Microbiology team made further breakthroughs in understanding *L. hongkongensis*. Faecal samples from patients with community-acquired gastroenteritis were cultured for *L. hongkongensis*. This indicated that this new bacterium can be one of the causes of gastroenteritis. The research also showed that *L. hongkongensis* is closely associated with eating fish and traveller's diarrhoea. Researchers will perform complete genome sequencing of *L. hongkongensis*, so as to understand how the bacterium causes gastroenteritis, as well as its treatment and prevention.

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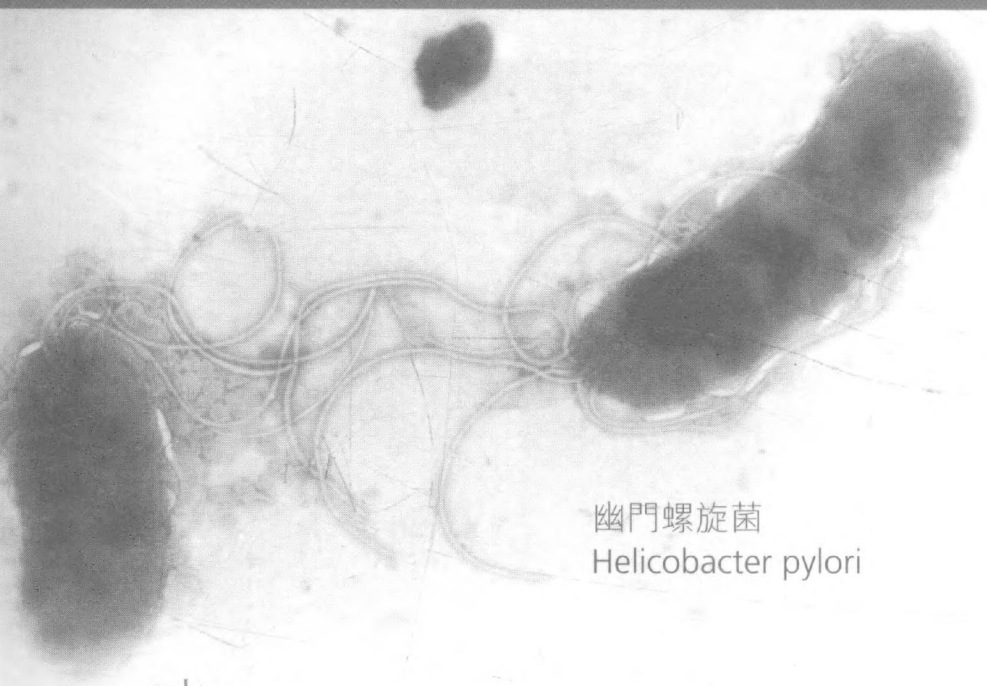
幽門螺旋菌感染
Helicobacter pylori infection



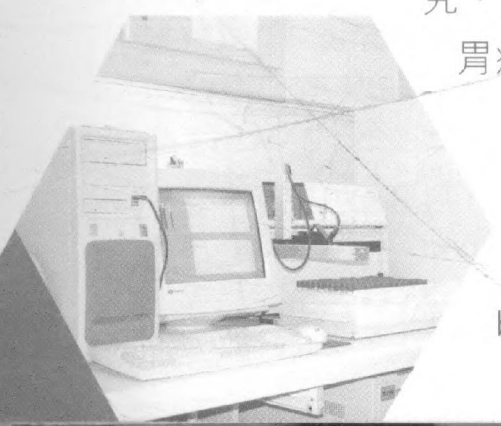
幽門螺旋菌
Helicobacter pylori

幽門螺旋菌在八十年代首次被發現，此菌普遍在人的胃內生長，全球約有五成人口受感染。患者一般並不察覺，經檢查才會發現。部份感染會演變為胃潰瘍、十二指腸潰瘍甚至胃癌。

港大內科學系的腸胃肝臟科致力進行幽門螺旋菌的研究，並在香港引進首個質譜儀，用以進行幽門螺旋菌呼吸測試。這個無痛測試能安全和快速地診斷檢查者是否受感染。

過去十年，港大與中國內地及國際機構進行科研合作，在幽門螺旋菌及胃癌研究方面取得重大突破。港大腸胃肝臟科是全球首個研究隊伍，證實治療幽門螺旋菌的感染可以減低患上胃癌的機會。有關研究於九四年開始在中國福建省進行，並獲李國賢研究基金（腸胃病及肝病）、霍英東基金、香港研究資助局和多間藥廠與業界資助。

港大現時在香港、福建、山東、廣州及上海均有進行臨床研究，並且擁有特別設計的實驗室和儀器，以作胃癌及大腸癌的動物和細胞實驗。



呼吸測試用的儀器
Machine for detecting Helicobacter pylori by breath test

Helicobacter pylori, a bacterium present mainly in the stomach, was discovered only in early 1980s. This important bacterium is present in 50% of the world population. People are not aware that ones have the infection, unless ones ask to have it tested specifically. A small number of infected subjects will develop into stomach ulcer, duodenal ulcer and even stomach cancer.

The Division of Gastroenterology & Hepatology at Department of Medicine of the University of Hong Kong, is actively involved in research projects related to Helicobacter pylori. The Division was the first in Hong Kong to install the mass spectrometer for detecting this infection with breath samples. This painless, safe and quick test benefits the patients a lot.

International collaboration over the past ten years with researchers including those from the Mainland China led to ground-breaking results in the relationship between Helicobacter pylori and stomach cancer. The Division is the first group in the World to show that treatment of the infection reduces the risk of developing stomach cancer, result from a project carried out in Fujian, China. The project was started in 1994 with the generous support from the Simon KY Lee Gastroenterological Research Fund, Henry Fok Foundation, the Research Grants Council of Hong Kong, and pharmaceutical and industrial donations.

At present the University is carrying out clinical studies in Hong Kong, Fujian, Shandong, Guangzhou and Shanghai. It also has specially designed laboratory space and equipment for animal and cell line work in stomach cancer and colon cancer.

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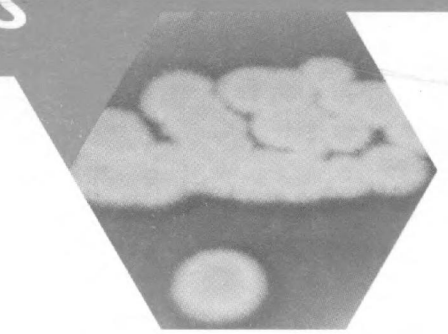

馬菲氏青霉菌
Penicillium marneffei

馬菲氏青霉菌是一種只活躍於東南亞的真菌，大部分病例均在泰國發現，其他受影響地區包括香港、越南、馬來西亞、台灣及中國的廣東省和廣西省。患者一般患有免疫系統疾病，例如愛滋病。在香港有百分之八的愛滋病患者受馬菲氏青霉菌感染。

港大在一九八五年發現了香港首宗的馬菲氏青霉菌感染個案。此後，港大致力研究無創傷的快速診斷方法，並於九四年成功開發螢光血液抗體測試，成為全球首個利用分子技術，並且快速準確的檢測方法。為了加深對這種霉菌在生物學及病理學上的理解，港大現正積極進行有關的基因研究。

Penicillium marneffei is a dimorphic fungus found only in Southeast Asia. The largest number of cases of human infections was reported from Thailand; other affected areas include Hong Kong, Vietnam, Malaysia, Taiwan, and the Guangdong and Guangxi provinces of China. Most of the patients who develop disease as a result of its infection have some underlying diseases which impair their immune system; the commonest underlying problem is infection with the human immunodeficiency virus (HIV). In Hong Kong, about 8% of the AIDS patients had been infected by *Penicillium marneffei*.

The University of Hong Kong described the first local case of *Penicillium marneffei* infection as early as in 1985. Since then, the University has been working on ways to diagnose the infection as quickly as possible without the need to perform invasive procedures. For example, the University developed the first indirect immunofluorescent antibody blood test for this infection in 1994, and it was also the first group in the world to use molecular techniques to develop tests for more rapid and accurate diagnosis. In recent years, a genome project was started on this fungus which will give insights to the biology and pathogenesis of the fungus.

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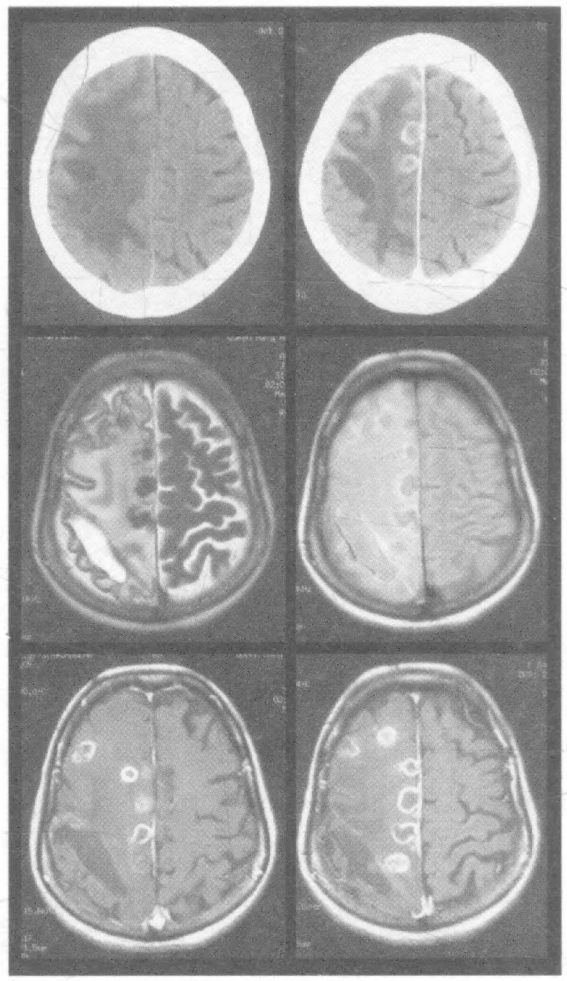
結核性腦膜炎
Tuberculous meningitis

結核性腦膜炎在香港是常見的腦科疾病，每年的發病率大約是每十萬人口中有兩個病例。這是一種肺外結核病，即發生在肺以外其他器官的結核病。此病的死亡率及殘障率頗高，但臨床診斷並不容易。典型的結核性腦膜炎較為慢性，病徵並不明顯，但本地患者病情往往較為急性，病徵持續呈現不足兩星期。常見的病徵為頭痛和發熱。過往的研究已發現，快速診斷和及早使用抵抗結核菌藥物，對治療十分重要。香港大學腦內科的醫生正計劃進行臨床研究，測試大劑量的皮質醇和抵抗血小板藥物在減低結核性腦膜炎所引起之腦神經併發症的功效。

Tuberculous meningitis is common in Hong Kong with an annual incidence of about 2 per 100,000. It is a serious neurological disease with significant risk of disability and mortality. Diagnosis may be difficult. In contrast to the classical presentation as a chronic indolent disease, local patients often present acutely with symptoms lasting 2 weeks or less. Common presenting symptoms are headache and fever. Neurological



complications, such as cerebral infarct and hydrocephalus, are common. Previous studies have indicated the importance of prompt diagnosis and early commencement of anti-tuberculous drugs. The Division of Neurology of the University of Hong Kong is interested in conducting research on the potential value of high dose pulse steroid and antiplatelet therapy in minimizing the risk of neurological complications.

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壞死性筋膜炎
Necrotizing fasciitis

這是一種由細菌引起的嚴重感染，近年世界各地的報告均顯示，這種死亡率可以達到百分之五十的疾病正有增加的趨勢。過去五年內，瑪麗醫院曾經治療過六十多位患者，其中最常見的致病原是甲型化膿鏈球菌和創傷弧菌，後者多見於曾經接觸海水的病人。

壞死性筋膜炎早期的病徵與一般的蜂窩織炎相似，然而前者引起的皮膚紅腫及異常疼痛等徵狀會迅速蔓延，並會導致皮膚壞死。在香港大學瑪麗醫院的病例中，患者普遍年老並患有糖尿病、肝硬化等可能削弱免疫能力的疾病。不過，亦有年輕及一向健康正常的患者。治療方面，主要是利用外科手術迅速清除壞死的組織，以及給病人注射抗生素，或在必要時切除壞死的肢體以保存病人的生命。

Necrotizing fasciitis is a serious bacterial infection of subcutaneous tissues with mortality as high as 50%. It is seen more frequently worldwide recently. Among the 60 cases that have been treated in Queen Mary Hospital, Group A *Streptococcus* and *Vibrio vulnificus* are the commonest seen organisms. *Vibrio vulnificus* involvement is usually seen in cases with contaminated sea-water contact.

The initial clinical pictures of necrotizing fasciitis and celluitis, a far less severe skin infection, can be very similar. However, the signs and symptoms of necrotizing fasciitis, including redness of skin and exquisite pain, develop rapidly and eventually skin necrosis results. Although the disease usually affects elderly immuno-compromised hosts like those with diabetes mellitus and liver cirrhosis with the bacteria gaining entrance into the body via a wound, it can also occur in healthy young individuals with no history of trauma. The key to successful treatment is prompt diagnosis, rapid and radical removal of the affected tissues and use of antibiotics.

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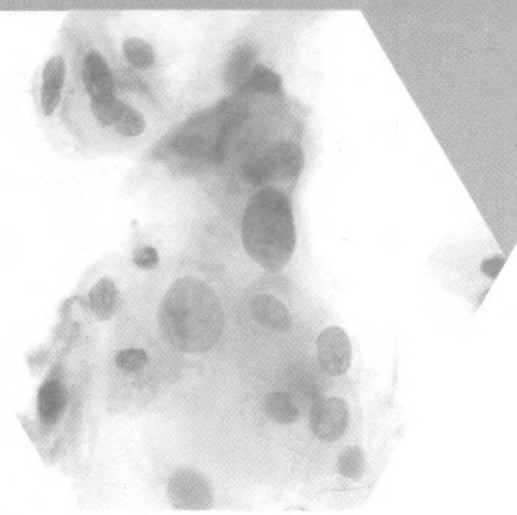
可致癌的病毒感染
Viral Infections Predisposing to Development of Cancers

子宮頸癌
Cervical cancer



人類乳頭瘤病毒的檢測 — 細胞學篩查子宮頸癌風險的輔診技術
HPV detection – an adjunct to the interpretation of cytology in screening for risk of cervical cancer

人類乳頭瘤病毒有多種不同類型，其中分低危險度和高危險度。高危險度的人類乳頭瘤病毒與大多數子宮頸上皮內瘤(CIN)，及浸潤性子宮頸癌的形成有關。

香港大學醫學院與香港家庭計劃指導會合作，並由余兆麒醫療基金贊助，研究如何利用人類乳頭瘤病毒的檢測，為非典型細胞病變的患者分流，即分辨哪些婦女需優先接受陰道鏡檢查。現時的程序是先重複進行子宮頸細胞化驗，再決定是否進行陰道鏡檢查。外國的研究發現檢測人類乳頭瘤病毒基因是另一個可行的選擇，因為此檢測對第三級的CIN (CIN III，即整層的子宮頸上皮都出現變異細胞) 的敏感度高，而且特異性與普通的細胞學檢查相若。

人類乳頭瘤病毒基因檢測能辨認出無須作陰道鏡檢查的婦女，以提高檢查服務的成本效益及減低婦女的憂慮。現時香港人類乳頭瘤病毒的感染率仍然不詳。港大正研究用 Hybrid Capture 檢測高危險度的人類乳頭瘤病毒，目標是研究人類乳頭瘤病毒分子化驗對臨床診治香港婦女子宮頸癌前病變的幫助。

Human papillomavirus (HPV) infection is now generally accepted as a necessary early event in cervical carcinogenesis. There are low-risk types and high-risk types of HPV. Infection with high-risk oncogenic types of HPV underlies most cases of high-grade cervical intraepithelial neoplasia (CIN) and practically all cases of invasive cervical cancer.

This project, in collaboration with the Hong Kong Family Planning Association and sponsored by the SK Yee Foundation, focused on the potential role of HPV molecular testing in triage of women with Atypical Squamous Cells of Undetermined Significance (ASCUS). Under current guidelines, these women would need to have repeat cytology before decision for colposcopic examination can be made. Studies in other countries have shown that HPV DNA testing may be a viable option in the triage of women with ASCUS, demonstrating greater sensitivity for detection of CIN III and comparable specificity compared to a single repeat ASCUS or worse cytology.

As HPV testing had high negative predictive value, it may identify women in whom colposcopy was not required and thus maximize the cost-effectiveness of the colposcopy service and minimize the anxiety of the women. The prevalence of HPV infection in Hong Kong is still unknown. In the present research study, high risk HPV is being tested by Hybrid Capture assay. The aim is to study the relevance of HPV molecular assay in the management of ASCUS in the local population.

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肝癌
Liver cancer

與乙型肝炎病毒有關的肝癌 — 從基因表達譜識別診斷性及預後性標記

Hepatitis B virus-related liver cancer: identify diagnostic and prognostic markers from the gene expression profile

肝癌是香港第二號癌症殺手，大部分病例與乙型肝炎病毒有關。外科切除手術是最佳的治療方法，但由於腫瘤被發現時一般已屬末期，所以只有少於兩成的病人適合接受手術。此外，手術後癌症復發的情況仍然普遍，累積五年總生存率不足五成。因此，港大外科學系致力識別分子標記，以及早診斷肝癌及準確掌握病症的預後，以便採取更適合的治療策略。外科學系亦比較了肝癌細胞和正常的肝臟組織，並成功找出肝癌細胞獨特的表達基因。這些基因，部分可作為肝癌診斷及預後的基因標記。

Liver cancer is the second major cause of cancer death in Hong Kong, and the majority is related to hepatitis B virus infection. Surgical resection is the choice for curative treatment, but fewer than 20% of the patients are eligible to receive curative treatment because of an advanced tumor stage at the time of diagnosis. In addition, recurrence is still common after curative surgery and the cumulative 5-year overall survival rate is less than 50%. Therefore, the Department of Surgery targets to identify molecular markers to enable early diagnosis of the disease, and accurate prognosis prediction for better disease management. The genome-wide expression profile comparing the cancer and normal liver tissues has identified a number of differentially expressed genes. Some of these genes have the potential to serve as diagnostic and/or prognostic markers for liver cancer.

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外科學系 Department of Surgery

兒童傳染病
Common Childhood Infectious Diseases

甲型流感病毒
Influenza A virus

縱然公共衛生得到改善，兒童的防疫注射獲廣泛推行，傳染病所導致的死亡也相應顯著減少；然而，傳染病仍是引致兒童需要入院治療的主因。香港最常見的兒童傳染病包括呼吸道感染和腸胃炎。

呼吸道感染研究是港大醫學院兒童及青少年科學系一個主要的臨床研究項目，其中進行的兒童感染流感之住院情況的研究，引起了世界對全球性流感疫苗注射方案的注意及廣泛討論。此外，港大亦是其中一個首先系統性記錄人類間質肺炎病毒病人的住院治療情況，從而發現這病毒是導致香港兒童呼吸道感染的常見病因。

港大兒童及青少年科學系也研究了肺炎鏈球菌對抗生素的抗藥性。肺炎鏈球菌是導致兒童患上肺炎的主因。研究為本地醫生處方抗生素提供了寶貴的參考資料。此外，學系與東區尤德夫人那打素醫院的兒科合作進行普查，調查七種常見的兒童呼吸道病毒的流行情況，計劃為期三年。學系亦研究哮喘病童的發病原因，嘗試確定病毒在當中的角色。

有謂預防勝於治療，兒童及青少年科學系一直進行疫苗的臨床測試，包括鼻孔注入流感疫苗和水痘疫苗。此外，學系於二零零四年五月展開了輪狀病毒疫苗的研究，有一千名嬰孩參與。

Despite much improved hygiene, sanitation and implementation of childhood immunization resulting in a significant decline in mortality from infectious diseases, infection remains the leading cause of acute paediatric admission to hospitals. The most common infectious diseases in children in Hong Kong are respiratory infections and gastroenteritis.

One of the major efforts in the clinical research of the Department of Paediatrics and Adolescent Medicine of the University of Hong Kong has been on respiratory infections. Their study that documented the hospitalization disease burden of influenza in healthy children has gained worldwide attention in the global discussion of universal influenza vaccination. The Department was one of the first groups in the world to document systematically the disease pattern and hospitalization impact of human metapneumovirus, a newly discovered virus, and found that it was a common cause of respiratory infection in Hong Kong children.

The Department has also documented the high incidence of carriage of antibiotic resistant *Streptococcus pneumoniae*, the most common cause of bacterial pneumonia in children. The findings provided information regarding antibiotic prescription to local doctors. In collaboration with the Department of Paediatrics at the Pamela Youde Nethersole Eastern Hospital, the Department is currently conducting a 3-year comprehensive, population-based study on 7 most common respiratory viruses in children. There is also an ongoing study that aims to define the viral etiology of asthma attacks in asthmatic Hong Kong children.

Prevention is of paramount importance in reducing communicable diseases in children and the Department has been involved in clinical vaccine trials that included an intranasal influenza vaccine and a chickenpox vaccine. A rotavirus vaccine study involving 1000 infants was commenced in May 2004.

研究員 Investigator in-charge:

招瑞生 SSS Chiu, 兒童及青少年科學系
Department of Paediatrics and Adolescent Medicine

病菌對抗生素的抗藥性
Antimicrobial Resistance

由於人們過度使用抗生素，令病菌有更多機會學習抵抗抗生素，繼而產生抗藥性。能夠抵抗抗生素的病菌會存活下來，並且把相關的基因傳給後代，或其他種類的微生物。於是，具有抗藥性的病菌就越來越多，抗生素的效用也就愈來愈低，最終可導致病菌變成無藥可治的「惡菌」，威脅人類的生命。

港大微生物學系進行抗生素抗藥性研究多年，成果備受本地、區內及國際的重視，對製藥業及公共衛生機關的策略有重要影響。例如香港首宗發現的鏈球菌肺炎對氟諾酮類抗生素的抗藥性，以及金黃葡萄球菌對萬古霉素的抗藥性。最近研究人員又有新發現，包括全球首宗在兒童身上發現對氟諾酮有抗藥性的流感嗜血杆菌，和發現香港首宗社區感染對甲氧西林有抗藥性的金黃葡萄球菌。

微生物學系會繼續進行抗藥性原理和流行病學研究。其他研究還包括革蘭氏陰性細菌內的乙內醯胺，開發對抗超級細菌的新一代萬古霉素，以及開發多種抗藥性的肺結核分支桿菌的快速測試。

Overuse and misuse of antimicrobials has become a global problem, contributing to the emergence of antibiotic-resistant micro-organisms. The excessive and inappropriate use of antimicrobials gives harmful micro-organisms lots of opportunity to develop resistance to antibiotics. Resistant organisms survive, and they pass resistant genes to their offspring and also to other species, further contributing to the spread of resistance. The result is that antibiotics are losing their effectiveness. Antimicrobial resistance becomes a major threat to public health.

The Department of Microbiology of the University of Hong Kong pioneered the research in antimicrobial resistance. Findings that have local, regional, or even international significance were made repeatedly. Examples that have led to strategic responses from the pharmaceutical industry and public health agencies include the first cases of fluoroquinolone-resistant *Streptococcus pneumoniae* and vancomycin-resistant *Staphylococcus aureus* isolated in Hong Kong. Recently, alarm bells were sounded by the team on cases of fluoroquinolone-resistant *Haemophilus influenzae* in children and community-acquired methicillin-resistant *Staphylococcus aureus* (MRSA).

The Department continues to study the epidemiology and mechanisms of antibiotic resistance in the human pathogens of regional significance. Research effort is also laid on novel or emerging beta-lactamases in Gram negative bacteria, development and evaluation of new glycopeptides for vancomycin-resistant Gram positive bacteria, and also rapid tests for the multi-drug resistant *Mycobacterium tuberculosis.*

研究員 Investigator in-charge:

何栢良 PL Ho, 微生物學系 Department of Microbiology

傳染病流行病學研究
Infectious Disease Epidemiology

傳染病在全球肆虐，香港處於突發性傳染病的高危地區，更需要一套完善的傳染病監察及信息系統以預測傳染病的變化及制訂相應疾病控制策略。

衛生福利及食物局控制傳染病研究基金已委託香港大學社會醫學系及公共衛生學院，進行為期四年有關傳染病流行病學的研究，並成立亞洲首個跨地區傳染病心理行為監測研究數據庫。

香港大學社會醫學系及公共衛生學院聯同國際流行病學專家，包括倫敦帝國學院、哈佛公共衛生學院，以及香港衛生署及醫院管理局共同建立「傳染病數據庫」，並進行疾病模型高級數據分析及風險傳意研究，包括在大型疾病（包括沙士、流感和結核病等）爆發時人群心理行為監測等。

這項研究計劃將為香港建立一個完善的傳染病和慢性病信息系統，監測傳染病的趨勢及變化，使有關醫療機構可及早制訂有效的疾病控制策略，以達到衛生防護的長遠目標。

Infectious disease has become a global health threat. As Hong Kong is situated at a high risk area of emerging infectious diseases, it is important to have a health information system to provide a platform for tracing, control and prevention of infectious diseases.

The Research Fund for the Control of Infectious Diseases set up by the Health, Welfare and Food Bureau has commissioned the Department of Community Medicine and School of Public Health, the University of Hong Kong to conduct a four-year synergistic and intersecting functional research programme on infectious disease epidemiology.

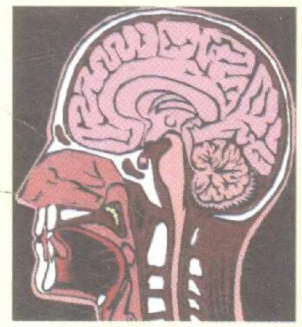
Researchers from the Department of Community Medicine and School of Public Health, the University of Hong Kong will collaborate with international experts from Imperial College, London and Harvard School of Public Health, together with the Department of Health and the Hospital Authority to establish the first regional "Infectious Disease Data Management and Analysis System". The research team will conduct advanced data analysis, disease modeling and risk communication research including population psycho-behavioural surveillance during major disease outbreaks (e.g. SARS, influenza and tuberculosis etc.).

It is anticipated that the research will help to establish a comprehensive database of infectious and chronic diseases. This will facilitate the surveillance of the evolution or epidemiology of emerging infectious diseases in the region and eventually, enhance the capacity of Hong Kong in safeguarding public health.

研究員 Investigators in-charge:

林大慶 TH Lam, 賀達理 AJ Hedley, 梁卓偉 GM Leung,
莊日昶 R Fielding, 何禮明 LM Ho, 社會醫學系及公共衛生學院
Department of Community Medicine and School of Public Health

其他傳染病研究項目
Other Research on Infectious Diseases



EB病毒感染與鼻咽癌
Epstein-Barr virus infection and nasopharyngeal carcinoma

研究員 Investigator in-charge:
岑信棠 JST Sham, 臨床腫瘤學系 Department of Clinical Oncology

確立預報嚴重急性呼吸道綜合症的臨床準則
The development and validation of a clinical prediction rule for SARS

嚴重急性呼吸道綜合症、結核病、登革熱和流行性感冒的生物數理模擬
Biomathematical modelling of SARS, tuberculosis, dengue fever and influenza

子宮頸癌檢查的成本效益
Cost-effectiveness analyses of cervical cancer screening (including human papilloma virus) using state-transition Markov modelling

研究員 Investigator in-charge:
梁卓偉 GM Leung, 社會醫學系 Department of Community Medicine

香港對爆發/再度爆發突發性傳染病的準備
Research preparedness for emerging and potentially reemerging infectious diseases in Hong Kong (epidemiology component and microbiological component)

研究員 Investigators in-charge:
林大慶 TH Lam, 梁卓偉 GM Leung,
社會醫學系 Department of Community Medicine
袁國勇 KY Yuen, 裴偉士 JSM Peiris, 管軼 Y Guan, 何栢良 PL Ho,
微生物學系 Department of Microbiology

EB病毒感染與血癌
Epstein-Barr virus infection and blood cancers

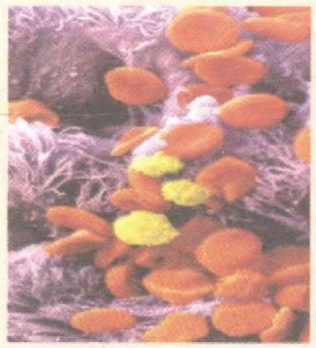
研究員 Investigator in-charge:
鄺沃林 YL Kwong, 內科學系 Department of Medicine

慢性乙型肝炎與血癌
Chronic hepatitis B infection and blood cancers

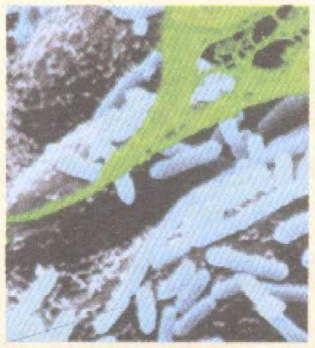
研究員 Investigators in-charge:
廖家傑 GKK Lau, 梁憲孫 RHS Liang, 內科學系 Department of Medicine

多瘤病毒 BK與骨髓移植
Polyoma BK virus and bone marrow transplantation

研究員 Investigator in-charge:
梁如鴻 AYH Leung, 內科學系 Department of Medicine



綠膿桿菌的綠膿菌素和1-羥基啡於體外對氣道上皮細胞糖皮質素受體的活化及功能的調節作出的影響
Effects of *Pseudomonas aeruginosa* pyocyanin and 1-hydroxyphenazine on the regulation of glucocorticoid receptor activation and function in airway epithelial cells in *vitro*



綠膿菌素於支氣管擴張中在支氣管上皮細胞內強化細胞因子的釋放和不同類別的藥物對它的抑制作用
Pyocyanin - potentiated cytokine release in bronchial epithelial cells and its inhibition by various classes of drugs in bronchiectasis

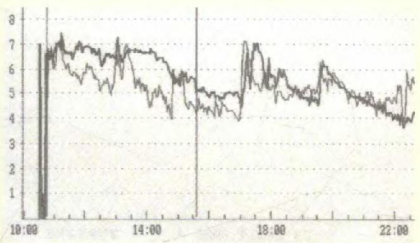
轉化生長因子 — 乙型一類 (TGF-β_1) 於支氣管擴張中氣道炎症的調節作用
The role of transforming growth factor-β_1 (TGF-β_1) in the regulation of airway inflammation in bronchiectasis

嚴重急性呼吸道綜合症康復患者中的血清或血漿細胞因子水平
Serum or plasma cytokine levels in convalescent patients with SARS

› 研究員 Investigator in-charge:
麥翠和 JCW Mak, 內科學系 Department of Medicine

嚴重急性呼吸道綜合症的消炎及免疫調節治療
Treatment of SARS with anti-inflammatory and immuno-modulating drugs

泛小支氣管炎的診斷和治療
Diagnosis and management of diffuse panbronchiolitis



胃酸倒流與支氣管擴張
Effects of gastro-oesophageal reflux on bronchiectasis

細菌的氣管粘附
Respiratory pathogens interaction with airways – adherence and cell biology

› 研究員 Investigator in-charge:
曾華德 KWT Tsang, 內科學系 Department of Medicine

香港護士就嚴重急性呼吸道綜合症所採取的預防措施及健康狀況
Surveillance of nurses' preventive measures and health status in relation to the SARS epidemic in Hong Kong

懷疑染上嚴重急性呼吸道綜合症的兒童病患者及其父母於住院其間的生理、心理和社交需要
A study of the physical, psychological and social needs of a cohort of suspectedSARS paediatric patients and their parents during hospitalization

在嚴重急性呼吸道綜合症肆虐期間為長者所提供的電話健康評估及健康教育的成效
The effectiveness of a telephone health assessment and health education intervention to vulnerable elderly during the SARS epidemic

› 研究員 Investigator in-charge:
陳肇始 SSC Chan, 護理學系 Department of Nursing Studies

預防傳染病及嚴重急性呼吸道綜合症–學童防護措施
A preventive health promotion program to SARS and other infectious diseases to school children

研究員 Investigator in-charge:

周美娟 DMK Chow, 護理學系
Department of Nursing Studies

脊柱結核病的遠期隨訪
Tuberculosis infection of the spine

研究員 Investigator in-charge:

陸瓞驥 KDK Luk,
矯形及創傷外科學系
Department of Orthopaedics and Traumatology

手部海洋結核桿菌感染
Mycobacterium marinum infection of the hand

研究員 Investigator in-charge:

周肇平 SP Chow, 矯形及創傷外科學系
Department of Orthopaedics and Traumatology

愛滋病毒的致病性: 發出信號的激酶和病毒的基因
Mechanism of HIV immunopathogenesis: signaling kinases and HIV genes

研究員 Investigator in-charge:

劉錫賢 ASY Lau, 兒童及青少年科學系
Department of Paediatrics and Adolescent Medicine

與EB病毒相關的基因和鼻咽癌
EBV-associated genes and nasopharyngeal carcinoma

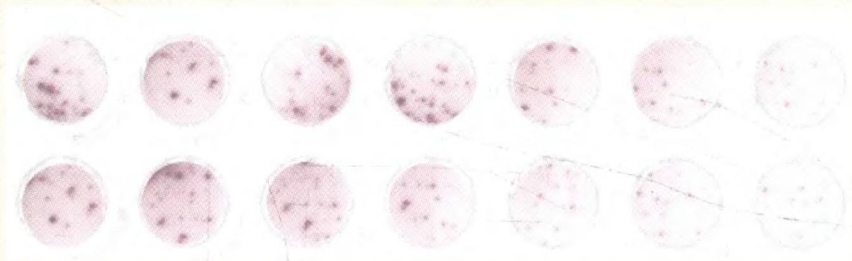
研究員 Investigators in-charge:

劉錫賢 ASY Lau, 兒童及青少年科學系
Department of Paediatrics and Adolescent Medicine;
岑信棠 JST Sham, 臨床腫瘤學系
Department of Clinical Oncology

禽流感病毒的致病性和不規則細胞活素調控
Immunopathogenesis of avian influenza infection and cytokine dysregulation

研究員 Investigators in-charge:

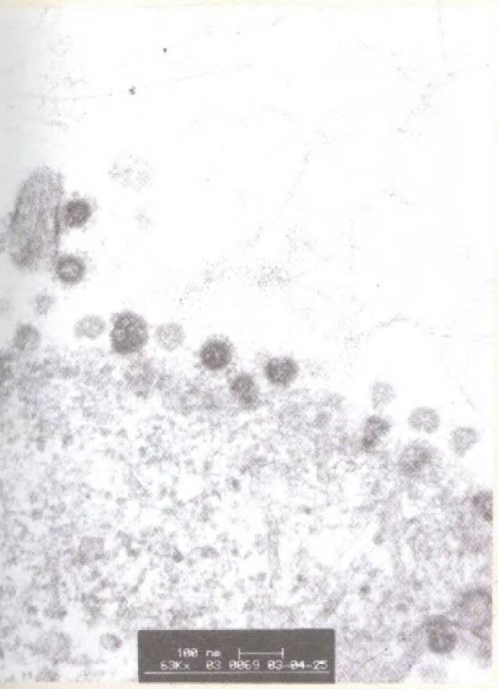
劉錫賢 ASY Lau, 兒童及青少年科學系
Department of Paediatrics and Adolescent Medicine;
裴偉士 JSM Peiris, 微生物學系 Department of Microbiology



冠狀病毒肺炎病人的細胞素數據及嚴重急性呼吸系統綜合症數據單元的分析
Cytokines in patients with coronavirus pneumonia and analysis of a laboratory database for SARS

研究員 Investigator in-charge:

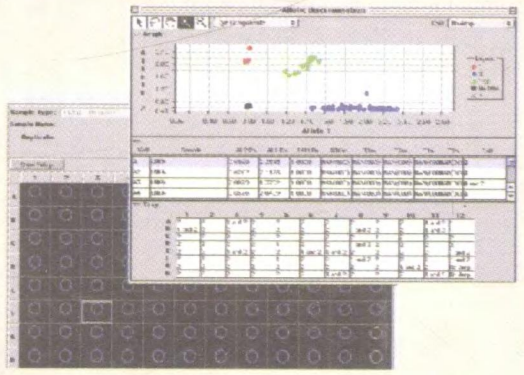
BM Jones, 病理學系 Department of Pathology



「沙士」冠狀病毒的超微結構描述
Ultrastructural characterization of the SARS Coronavirus (SARS-CoV)

研究員 Investigator in-charge:

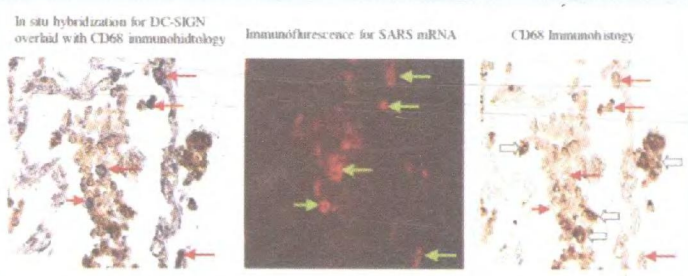
黎國思 JM Nicholls,
病理學系 Department of Pathology



嚴重急性呼吸道綜合症的遺傳易感性
Genetic susceptibility to SARS infection

研究員 Investigator in-charge:

邱瑋璇 US Khoo, 病理學系 Department of Pathology



DC-SIGN 作為「沙士」冠狀病毒在樹突狀細胞的受體
Role of DC-SIGN as a receptor for SARS virus

HIV 鞘膜蛋白附著在DC-SIGN 導致樹突細胞活化後凋亡
Interaction of DC-SIGN and HIV virus

研究員 Investigators in-charge:

林成龍 CL Lin, 陳秀芳 VSF Chan, 外科學系 Department of Surgery

乙型肝炎的先天性免疫
Innate immunity to hepatitis B virus: host-pathogen relationship

研究員 Investigators in-charge:

李珮瑜 NPY Lee, 陸滿晴 JMC Luk, 外科學系 Department of Surgery

本地及國際性合作
Local and International Collaborations

臨床試驗中心
Clinical Trials Centre

香港大學臨床試驗中心是一所領先的學術科研中心，是亞洲首間及目前區內唯一一間專門為臨床試驗的主辦者及研究員提供一站式服務的學術科研中心。

臨床試驗中心致力以道德、科學、質控及教育，提高臨床試驗之質效，改善人類的健康。

中心提供的服務包括科研諮詢、財務預算及合約事務、法規事務、項目管理、臨床研究基地網絡管理、研究單位管理、中央實驗室、藥品管理、數據管理、醫學統計分析及教育培訓等。中心已先後與世界各地五十多家跨國公司及研究機構進行科研合作。

Clinical Trials Centre (CTC), the University of Hong Kong is a leading academic research organization. It is the first, and currently the only full-service academic research organization in the Asian region dedicated to offering one-stop solutions to clinical trial sponsors and investigators.

Established under the Faculty of Medicine of the University of Hong Kong, CTC is committed to enhancing human healthcare by promoting the quality and efficacy of clinical trials through ethical considerations, scientific expertise, quality assurance and education.

CTC's main services include research consultation, budget and contract processing, regulatory affairs, project management, trial network management, site management, central laboratory, research pharmacy, data management, medical statistics and education. So far it has already worked with some 50 research-based international companies and organizations worldwide.

基因研究中心
Genome Research Centre

設立於香港大學的基因研究中心成立於二零零二年，專為帶領基因研究工作在香港、華南及地區性的發展。中心以港大為基地，但其中的服務設施可以供全港各大學使用。基因研究中心將會為基因組、蛋白質組、生物信息等研究提供專家知識及基礎架構，中心亦會推廣及應用基因的知識、蛋白質的編碼及其功能，藉以瞭解疾病機制及開發診斷治療方法。

香港大學醫學院
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傳染病研究捐款表格
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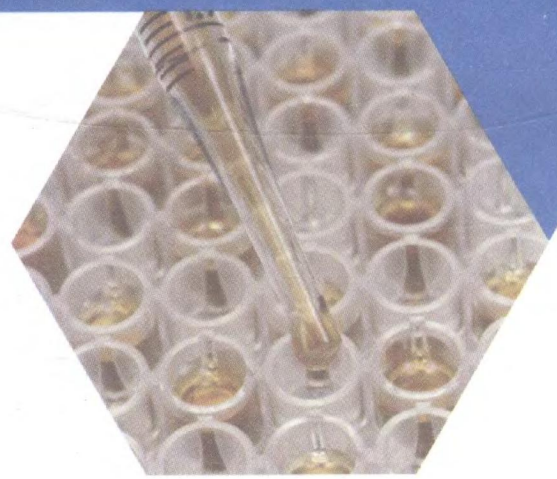

香港大學-巴斯德研究中心
HKU-Pasteur Research Centre

The Genome Research Centre was established in 2002 to lead the genome research in Hong Kong, South China and the region. While the centre is based at the University of Hong Kong, its service is available for use by all universities in Hong Kong. The Centre has a mandate to provide the expertise and infrastructure for studies in genomics, proteomics, and bioinformatics. It aims to promote and facilitate the translation of the knowledge of genes, the proteins they encode, and their functions into applications for the understanding of disease mechanisms and for the development of diagnostic and therapeutic measures.

香港大學-巴斯德研究中心由兩所高等學府，法國巴斯德研究所及香港大學共同創立。法國巴斯德研究所的成就包括:曾獲得六個諾貝爾獎，成功研製乙型肝炎疫苗及分離愛滋病毒，以及完成首個細菌基因排序。自二零零零年成立以來，研究中心聯同香港大學及法國巴斯德研究所，合力推動微生物學、免疫學及有關學科在科學和技術上的研究與教育。在設備先進而完善的實驗室中，研究中心的科學家們致力微生物的基因研究，探索知識和技能以對付各種致病原。

The HKU-Pasteur Research Centre is a joint venture of the University of Hong Kong and the prestigious Institut Pasteur of France which has won 6 Nobel prizes, discovered hepatitis B vaccine and HIV, and mapped the first genome of bacteria. Since its inauguration in 2000, the Centre has promoted in conjunction with the University of Hong Kong and Institut Pasteur of France scientific and technological research in the field of microbiology, immunology and related disciplines, as well as education, teaching and learning. Scientists in the Centre work on the basis of genetics of microbial genomes so as to generate the knowledge, skills and training for application in tackling any emerging pathogens.

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