



### **LOCATION MAP**





#### LAU OI WAH MEMORIAL SCIENCE LECTURE SERIES

Theme: Science for changing times
Date: 19 November 2005 (Saturday)

Time: 09:30 - 17:00

Venue: Sir Run Run Shaw Hall, The Chinese University of Hong Kong

Programme:

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Time 時間	Programme 程序表	Speaker 演講者
09:30 - 10:00	Opening Ceremony 開幕禮	
10:00 - 10:45	Talk 1: The battle against malaria — One of the biggest killers on the planet (C) 藥積 "瘧"離—追擊科學對抗瘧疾之發展 (廣)	Professor Shannon Au 區詠娥教授 (Department of Biochemistry 生物化學系)
10:45 - 11:30	Talk 2: Stem cell therapy — A technology that will change our life (E) 幹細胞療法 — 一個將改變人類生活的新技術 (英)	Professor Wei Ge 葛偉教授 (Department of Biology 生物系)
11:30 - 12:15	Talk 3: The two sides of soft drugs — A chemical perspective (C) 軟性藥物的化學兩面觀 (廣)	Professor Hung-Kay Lee 李鴻基教授 (Department of Chemistry 化學系)
12:15 - 13:00	Talk 4: How mathematics contributes in the information era? (C) 數學在資訊年代的貢獻 (廣)	Professor Raymond Chan 陳漢夫教授 (Department of Mathematics 數學系)
13:00 - 14:30	Lunch Time 午饍	
14:30 - 15:15	Talk 5: Extrasolar planets and extraterrestrial life <sup>(C)</sup> 宇宙的行星、宇宙的生命 <sup>(廣)</sup>	Dr. Shiu-Sing Tong 湯兆昇博士 (Department of Physics 物理系)
15:15 - 16:00	Talk 6: Betting on random experiments — Some facts about horse racing and its related gambling $(E)$ 對隨機事件下注 — 一些關於賽馬的常識 $($ $\stackrel{(}{\Sigma})$	Professor Ming-Gao Gu 顧鳴高教授 (Department of Statis- tics 統計學系)
16:00 - 16:45	Talk 7: Ancient therapy for modern time — Acupuncture and analgesia. (C) 古為今用 — 針刺與鎮痛 (廣)	Professor Zhi-Xiu Lin 林志秀教授 (School of Chinese Medicine 中醫學院)
10:30 - 17:00	Exhibitions, Laboratory Visits, and	

#### Remarks:

- 1. Sir Run Run Shaw Hall will close from 13:00 14:00
- 2. (C) Cantonese; (E) English; (廣) 廣東話; (英) 英語

**Demonstrations** 

(Organised by the various Departments, Programmes and School of the Science Faculty) 由理學院各學系及課程安排展覽、實驗室參觀及示範

### MESSAGE FROM THE ACTING DEAN OF SCIENCE

Remembering Prof. O.W. Lau

Dr. Lau, as I have always called her since my undergraduate's time in the 70's, is a giant figure in my mind. She was a small person with great personality. She was one of the most dedicated persons I have ever known, dedicated to whatever tasks placed upon her. Her greatest contribution, of course, was her contribution to the Faculty of Science, CUHK. After a dramatic twist in Dean's elections in 1994, which I witnessed, she took up the deanship of science and served 3 consecutive terms for a total of 9 years until her retirement in August, 2003. During this period of deanship, she showed extraordinary dedication, passion and courage in handling the affairs of the Faculty. Her contribution to the faculty was tremendous. Science Centre, the home base of the Science Faculty, changed from a rundown old building into its superb condition we appreciate to-day. Introduction of multidisciplinary programmes extended the arms of science from pure science into the community and have since produced a generation of scientists in new areas. She established many measures to promote science education in the universities and high schools. These are but a few examples of the extensive contribution Dr. Lau made during her deanship.

I knew her very well personally. She taught me Analytical Chemistry when I was an undergraduate student and guided me through many stages of my career, as postgraduate student working on chemical analysis of mushroom compost to teaching career in Biology and Food Science. She never failed to enlighten me, always demanding

me to perform well. Her kindness, her admirable personality, and her care about students and staff members alike, remains a source of inspiration for many of us to dedicate to the business of the Science Faculty and to science. Dr. Lau, you will always be a giant figure in my mind. I miss her.

The Lau Oi Wah Memorial Science Lecture Series is the kind of educational activities in science that Dr. Lau would love. The rich programme in the series would indeed make her very happy. The passing on of the passion for science to the high school students would definitely a continuation of Dr. Lau's legacy. Organisers of the series, I salute you. I am certain that the series will be a great success.

This Rankwan

Hoi-Shan Kwan Professor Department of Biology

# MESSAGE FROM THE CHAIRMAN OF THE MANAGEMENT COMMITTEE OF LAU OI WAH MEMORIAL FUND

It is indeed my honour to have the opportunity to write a few words in this booklet for the first Lau Oi Wah Memorial Science Lecture Series, jointly organised by our Science Faculty and the Lau Oi Wah Memorial Fund.

Professor Lau joined The Chinese University of Hong Kong as an Assistant Lecturer in 1968. She rose through the academic ranks in subsequent years and retired as a Professor in the Department of Chemistry on July 31, 2003. Less than six months after her retirement, she passed away on January 15, 2004.

It is often said the performance of an academic in a university should be assessed on three fronts: teaching, research, and administrative duties. In my opinion, Professor Lau excelled on all three. For many years, Professor Lau was our mainstay analytical chemist: she designed and taught most of our analytical chemistry courses, including experiments in laboratory courses. In addition, she supervised/co-supervised more than 40 MPhil/PhD students, many of whom are now holding important positions in local institutions including the Government Laboratory. As a result of supervising these students, Professor Lau published her research results extensively in leading international journals. Administratively, she was elected by her colleagues in the Faculty for three successive three-year terms as the Dean of the Science Faculty. In other words, for nearly a decade, from 1994 to 2003, she participated in the deliberation of essentially all the important decisions of our University.

After Professor Lau's death, many of her friends and students suggested that a memorial fund be set up in her honour and this fund will be used in causes that are close to Professor Lau's heart: the welfare of the students. As I was serving as the Chairman of the Department of Chemistry at that time, it was my duty to send out the solicitation letters. Not surprisingly, the response was most favourable. After the fund was set up, two scholarships have been established in the Department; they are to be awarded to students with excellent academic records or under severe financial hardship. In addition, in the Science Faculty, now there is a Lau Oi Wah Cup for various inter-departmental competitions. When she was our Dean, Professor Lau spent a lot of effort in promoting science education in the high schools. To continue this endeavour, we have now established a Science Lecture Series, introducing frontier science topics to high school teachers and students. All these scholarships and student activities are fitting tributes to Professor Lau's long and distinguished service at the Chinese University of Hong Kong.

The first Science Lecture Series consists of seven talks, all delivered by our colleagues in the Science Faculty. The talks cover a wide range of topics, from mathematics to Chinese medicine. I am sure the audience will enjoy this feast of lectures.

> Wai-Kee Li Professor of Chemistry

Zi boinkel

### THE BATTLE AGAINST MALARIA — ONE OF THE BIGGEST KILLERS ON THE PLANET

Professor Shannon Au Department of Biochemistry The Chinese University of Hong Kong

### 藥積"瘧"離— 追擊科學對抗瘧疾之發展

Malaria, a parasitic disease transmitted by mosquitoes, kills one million people annually. By the time you finish reading this abstract booklet, an African child will be killed by infection of malaria. Scientists have been fighting the disease for 100 years, by developing insecticides and drugs that targeting the parasites. Every time we thought we were the champion, the disease rolled back and evolved more resistance to the drugs. Nowadays, prevention and treatment of malaria is one of the major global health challenges. What are our current tactics to combat the enemy? Are we going to win this time? This lecture will review the history of our battle with malaria.





瘧疾是一種由蚊隻作傳播媒介的寄生蟲疾病,每年奪去約一百萬人的性命。當你把這本摘要小冊子看完的時候,就會有一名非洲小童死於瘧疾感染。科學家透過對殺蟲劑和對付寄生蟲藥物的研究,已經對抗瘧疾近百年。但每當我們以為自己已經獲得勝利的時候,它就會捲土重來,並且進化至對我們的藥物更有抗藥性。至今,預防與治療瘧疾仍是其中一個全球當務之急的健康醫療挑戰。我們近代究竟有甚麼策略去抗衡這個頑強的敵人?我們今趟會獲得勝利嗎?這堂演講會與大家重溫我們與瘧疾抗爭的歷史。

Professor Shannon Au graduated from Portsmouth University, UK. She received her PhD degree in molecular genetics and structural biology at The University of Hong Kong. She then pursued her postdoctoral training in protein x-ray crystallography at The University of Hong Kong, The University of Oxford and The Institute of Cancer Research. She joined The Chinese University of Hong Kong in 2003 as an Assistant Professor in the Department of Biochemistry. Her research interest focuses on structural and functional significances of sumoylation — one of the important protein post translation modification processes.

區詠娥教授於英國樸茨茅斯大學畢業,並於香港大學取得分子遺傳及結構生物學之哲學博士學位。其後她分別於香港大學,牛津大學及倫敦癌症腫瘤研究所,繼續其有關 X-光繞射與蛋白質結晶學之博士後訓練,及後於2003年加入香港中文大學生物化學系為助理教授。區教授的主要研究方向為類泛素小型修飾因子 (Small Ubiquitin-like Modifier) 與類泛素化蛋白修飾現象 (Sumoylation) 之結構與功能上的重要性,類泛素化過程為一重要之蛋白質轉譯後修飾過程。

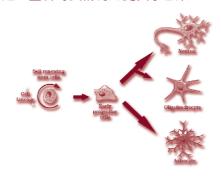
#### STEM CELL THERAPY — A TECHNOLOGY THAT WILL CHANGE OUR LIFE

Professor Wei Ge Department of Biology The Chinese University of Hong Kong

### 幹細胞療法 — 一個將改變人類生活的新技術

Embryonic stem (ES) cells are pluripotent unspecialised cells that can proliferate for long time and have the potential to become different types of cells in the body. Studies on ES cells and how to induce them to differentiate into various cell types promise to provide a powerful tool for cell-based tissue therapies to treat the pervasive diseases such as Alzheimer's and Pakinson's diseases, diabetes, stroke, heart disease, etc. However, one of the biggest hurdles for the application of ES cells is the immune rejection by the recipient. The ideal solution to this problem is to obtain the recipient's own ES cells that are fully compatible with his/her immune system. The question then is where to obtain these ES cells. The answer to this question comes from another newly emerging technology — cloning.

胚胎幹細胞是多潛能的非分化細胞。這些細胞能在體外長期擴增,並能進一步分化成身體內的各種功能細胞。有關胚胎幹細胞及誘導其分化的研究將為以細胞為基礎的組織療法提供一個有效的工具,而這些療法將有助治療老年癡呆症、帕金森氏病、糖尿病、中風、心臟病等老齡性疾病。然而,幹細胞技術應用所面臨的問題之一是受者身體的免疫排斥反應。解決這一問題的最佳途徑是獲取受者本身的胚胎幹細胞,但是這些細胞又從何而來呢?克隆 — 這一全新的技術為此提供了答案。



Professor Wei Ge received his BS degree from Nanjing University in 1982 and MS degree from the Academia Sinica in 1985. After he obtained his PhD degree in physiology from University of Alberta, Canada in 1993, he moved to the National Institute for Basic Biology, Japan to work as a postdoctoral fellow with a scholarship from the Natural Sciences and Engineering Research Council (NSERC) of Canada. Since he joined the Department of Biology at The Chinese University of Hong Kong in 1995, he has been teaching a variety of undergraduate and graduate courses, including animal physiology, fundamentals of human physiology, vertebrate life, human biology, diversity of life, and advanced topics in molecular biology and biotechnology. His current research areas are molecular endocrinology of reproduction and developmental biology.

葛偉教授一九八二年於南京大學獲得理學學士學位,隨後於一九八五年獲中國科學院理學碩士學位。其後葛教授前往加拿大攻讀生理學,並於一九九三年獲University of Alberta 頒授哲學博士學位,同年獲得加拿大國家自然科學及工程研究局博士後獎學金,前往日本國立基礎生物學研究所從事博士後研究。自一九九五年加入香港中文大學生物系後,葛教授除了繼續從事他感興趣的繁殖內分泌及發育生物學研究外,還參與本科及研究生課程的教學工作,包括動物生理學、基礎人體生理學、脊椎動物學、人類生物學、生物多樣性、以及分子生物學及生物技術進展等。

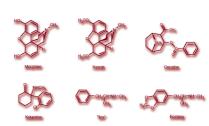
### THE TWO SIDES OF SOFT DRUGS — A CHEMICAL PERSPECTIVE

軟性藥物的化學兩面觀

Professor Hung-Kay Lee Department of Chemistry The Chinese University of Hong Kong

A drug is a chemical substance that affects an individual in such a way as to bring about physiological, emotional and behavioural change. A drug can be a natural product (e.g. an alkaloid) or a chemical synthesised in laboratories (a semi-synthetic or synthetic drug). To date, a wide variety of drugs have been developed for medical uses such as diagnosis, treatment or prevention of various diseases. Unfortunately, some of these substances are liable to abuse. Morphine, an alkaloid isolated from opium, is one of the most effective pain-killer drugs. Codeine and heroin are close analogues of morphine. Codeine is used as a cough suppressant, whereas heroin is a powerful narcotic analgesic. Cocaine, comes from the leaves of coca plants, is the most potent stimulant of natural origin. It has been used as a topical anaesthetic. Ketamine is an anaesthetic for veterinary use. Amphetamine and methamphetamine ("ice") are powerful stimulant drugs which have been used as an appetite suppressant and for the treatment of mild depression,

whilst the closely related 3,4-methylenedioxymethamphetamine (ecstasy) is a powerful psychoactive drug with no proper medical use. In this talk, we will look at the chemistry, development and activities of these common soft drugs.



藥物是化學物品,服用後能引致生理上、 情緒上及行為上出現改變。藥物大致可分

為兩類:一類為天然產物(如生物碱),另一類可在實驗室裡製備(半合成或全合成藥物)。今天,人們已研製出不同種類的藥物,用作診斷、治療或防治各種疾病。可惜部分藥物常被濫用。嗎啡是一種從罌粟提取出來的生物碱,具有強力的鎮痛作用。可待因和海洛英可從罌粟經化學方法提煉而成。可待因用作止咳藥物,而海洛英是一種強力的麻醉鎮痛類毒品。可卡因是從古柯樹葉提取出來的一種生物碱,屬強力的興奮劑,也曾用作表面麻醉劑。象胺酮是一種用於動物手術的麻醉劑。安非他明及甲基安非他明("冰")屬興奮劑藥物,在醫學上用作減低食慾及治療抑鬱。其衍生物亞甲二氧基甲基安非他明(俗稱搖頭丸)也屬強力的興奮劑,但無醫學作用。此講座將探討一些常見軟性藥物的化學、研製過程及其特性。

Professor Hung-Kay Lee obtained his BSc and PhD degrees at The Chinese University of Hong Kong. After he completed his PhD study, he spent two years as a Postdoctoral Fellow at California Institute of Technology. He joined The Chinese University of Hong Kong as an Assistant Professor in the Department of Chemistry in 1997. His research interest focuses on synthesis and structural characterisation of metal complexes with biological relevance.

李鴻基教授於香港中文大學獲得理學士及哲學博士學位,其後前往美國 加州理工學院從事博士後研究工作。李教授於一九九七年回到母校,於化 學系擔任助理教授一職,現任化學系副教授。他的研究興趣以金屬絡合物 的合成、結構、及其生物意義為主。

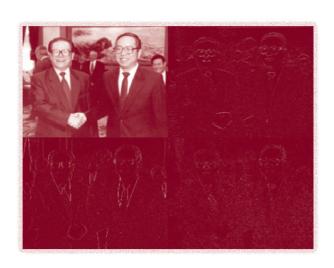
### HOW MATHEMATICS CONTRIBUTES IN THE INFORMATION ERA?

#### 數學在資訊年代的貢獻

Professor Raymond Chan
Department of Mathematics
The Chinese University of Hong Kong

We are living in the information era where almost everything can be converted into numbers. Images we see on the internet, voices we hear on the mobile phones, search results we get from Google-all these involve sophisticated mathematics to make them possible. In this talk, we will discuss the mathematics behind some of the common applications in the digital age.

在我們生活的資訊時代裡,幾乎每樣東西都可以轉換成數字。互聯網上的圖像、流動電話裡的聲音、Google 的搜索結果等,皆需應用精密的數學才可行。在這次講座中,我們將討論數學在數字時代的廣泛應用。



Professor Raymond Chan obtained his BSc degree at The Chinese University of Hong Kong, and MSc and PhD degrees from New York University. He had taught at The University of Massachuetts at Amherst, The University of Hong Kong, and The Hong Kong University of Science and Technology before joining his Alma Mater. His research interest is on numerical analysis, especially fast solvers for linear systems.

陳漢夫教授於香港中文大學取得理學士學位,並於美國紐約大學取得理學 碩士及哲學博士學位。在任教香港中文大學之前,陳教授先後在美國麻省 大學阿默斯特分校、香港大學和香港科技大學任教。陳教授的研究領域為 數值分析,尤其是線性方程組的快速解法。

### EXTRASOLAR PLANETS AND EXTRATERRESTRIAL LIFE

### 宇宙的行星、宇宙的生命

Dr. Shiu-Sing Tong
Department of Physics
The Chinese University of Hong Kong

About ten years ago, astronomers used an indirect observation technique to confirm the existence of planets outside our solar system for the first time. Up to now, more than a hundred of these extrasolar planets have already been discovered. This important finding indicates that a wide variety of planets exist in the universe. Perhaps some of these planets have close resemblance with the Earth, and might even have given rise to life. Nowadays, astronomers are armed with state-of-the-art technology to explore these unknown worlds. While new evidences continuous to emerge, the fascinating old question remains: Is it really possible for us to get in contact with extraterrestrial civilisations? If so, what kinds of media should we use? Send a spaceship and hope for its eventual capturing by the alien? Say hello to the ET using radio waves? Let's see how scientists have been struggling for a breakthrough in these areas during the recent decades, and the prospect of our quest to uncover life elsewhere in the universe.



In 2004, astronomers used the Hubble Space Telescope to explore the extrasolar planet HD 209458b, discovering the naturally occurring elements carbon and oxygen in its atmosphere. The illustration is artist's conception of HD 209458b, showing the planet's atmosphere in continuous evaporation due to its close proximity to its star. (Courtesy of NASA, ESA, STScI)

2004年,天文學家利用哈勃天文望遠鏡探測一顆太陽系外行星 HD209458b的大氣層,並發現了天然的氧和碳成份。圖為藝術家筆下的 HD209458b,顯示其大氣正因為離恆星太近而不斷蒸發。(圖片鳴謝: NASA, ESA, STScI)

約在十年前,天文學家通過間接的觀測方法,首次確定了太陽系外行星的存在,至目前為止,已發現百多顆這類行星。這暗示宇宙中充滿著各式各樣的行星,當中或許有些和地球十分相似,甚至能夠孕育出生命。現代天文學家已準備用各種方法,去嘗試探測這些未知的世界。新的觀測證據不斷湧現,卻使我們想起一個古老而令人著迷問題:到底我們是否可以與天外文明取得聯繫?如果可以的話,又應該用甚麼方法呢?派出太空船,希望它終有一天被外星人俘獲?還是利用無線電波向外星人問候一聲?就讓我們看看近幾十年來科學家在這些方面的努力,和人類尋找外星生命的展望。

Dr. Shiu-Sing Tong received his PhD in Physics at CUHK, and has been serving at the Department of Physics, CUHK for years, teaching Physics and Astronomy courses. Dr. Tong is dedicated to the promotion of higher science education and general education through curriculum and courseware design in Physics and Astronomy, as well as the use of information technology. In collaboration with Education and Manpower Bureau, he established several web-based education resource centres including Physics World, Contextual Physics, and Contextual Physics in Ocean Park, providing innovative learning and teaching resources for secondary school students and teachers. He is also one of the authors of Longman's Physics in Life textbook series. Dr. Tong currently serves at the Department of Physics, CUHK as Senior Instructor, and also holds a concurrent position as Assistant Director at the Centre for Promoting Science Education of Science Faculty, CUHK

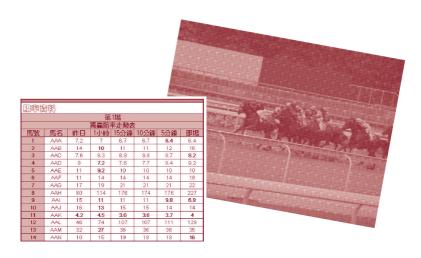
湯兆昇於香港中文大學獲得物理學哲學博士學位,畢業後於中大物理系任 教本科及通識科目,推動資訊科技輔助教學、物理教學、天文教育、及科 普教育的發展,並與教統局合作,先後建立《物理園》、《物理情境教 學》及《情境物理在海洋公園》等教材套,為中學教師和學生提供資訊科 技教學資源;亦是朗文《物理與生活》一書的作者之一;湯博士現任中大 物理系高級導師,並兼任中大理學院科學教育促進中心助理主任。

#### BETTING ON RANDOM EXPERIMENTS — SOME FACTS ABOUT HORSE RACING AND ITS RELATED GAMBLING

對隨機事件下注 — 一些關於賽馬的常識

Professor Ming-Gao Gu Department of Statistics The Chinese University of Hong Kong

Random events and their associated probabilities are important concepts related to everyday life. They will be demonstrated using examples of horse racing. Expectation is another important concept which will be illustrated by betting on horse racing results. From a scientific point of view, horse racing events are realisations of random events.



在日常生活中,有很多事情都能用到隨機事件及其關連的機會率,而這次 講座將會以賽馬作為範例,帶你認識這個重要的概念。而另一個重要的概 念是數學期望,我們將以下注賽馬為範例來加以說明。從科學的觀點來 看,賽馬事件較能令人領略隨機事件,屆時必能令聽眾了解箇中原理。 Professor Ming-Gao Gu obtained his BSc degree at Fudan University and consequently obtained his MPhil and PhD degrees at The Columbia University of New York City. Before joining The Chinese University of Hong Kong, he was a tenured professor at the McGill University. He joined The Chinese University of Hong Kong in the Department of Statistics in 1998. His research interest includes Monte Carlo methods, semi-parametric models, biostatistics, ranking data and risk management.

顧鳴高教授於中國復旦大學獲得理學士學位,隨後於美國紐約市哥倫比亞 大學先後獲得哲學碩士及哲學博士學位。於1998年加入香港中文大學統計 學系之前,顧教授曾受聘於麥基爾大學擔任終身教授。他的研究興趣以蒙 特卡羅方法、半母數模型、生物統計學、資料排序及風險管理為主。

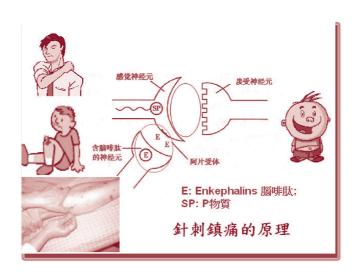
### ANCIENT THERAPY FOR MODERN TIME — ACUPUNCTURE FOR ANALGESIA

古為今用 — 針刺與鎮痛

Professor Zhi-Xiu Lin School of Chinese Medicine The Chinese University of Hong Kong

Acupuncture has been used in Chinese medicine for thousands of years, and its use for prevention and treatment of diseases has gained more popularity in the West since the 1970s. This presentation introduces the basic theories in acupuncture including meridians and acupoints, how acupuncture treats and heals, and suitable conditions for acupuncture. More emphasis will be given to the modern research findings on the mechanism of action concerning acupuncture for pain management.

針刺是一種獨特而常用的傳統中醫治療方法,近數十年來已經廣泛被西方國家所接受。本講座將介紹中醫針灸的基本理論,包括經絡和穴位、針灸治病的原理以及針灸治療的適應症。同時重點介紹針刺療法的現代研究,包括針刺鎮痛原理的闡明。



Professor Zhi-Xiu Lin graduated from Guangzhou University of Chinese Medicine in 1987 with a BSc degree in Chinese Medicine. After graduation, he worked as a Chinese medicine doctor at the Affiliated Hospital of Guangdong Provincial Research Institute of Chinese Medicine. In 1991 he moved to England to study English language, which was followed by a PhD degree study at the Department of Pharmacy, King's College, University of London. He obtained his PhD degree in Pharmacognosy in 1999. In 1998, he was employed as a Senior Lecturer on the Chinese Medicine Programme, Middlesex University in London, where he was involved in basic and clinical teachings of Chinese medicine. Professor Lin joined The Chinese University of Hong Kong in 2003 as an Assistant Professor at the School of Chinese Medicine. He is now engaged in the teaching of Chinese medicine as well as supervising postgraduate students' research projects.

林志秀教授,1987年畢業於廣州中醫藥大學醫療系。畢業後從事中醫臨床工作。1991年赴英國學習語言,後進入倫敦大學國王學院(King's College London) 攻讀生藥學哲學博士學位。1998年受聘到英國中薩大學(Middlesex University) 傳統醫學系任中醫學高級講師,從事中醫藥和針灸的基礎和臨床教學工作。2003年加入香港中文大學中醫學院,任職助理教授。現擔任本科《中醫基礎理論》、《中醫診斷學》以及參與研究生班《內科學》和《針灸學》的教學工作,同時指導院內博士生的研究課題。







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