香港大學李嘉誠醫學院

香港沙宣道二十一號

The University of Hong Kong
Li Ka Shing Faculty of Medicine

21 Sassoon Road, Hong Kong

Press Release

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HKU Successfully Developed Oral Arsenic Trioxide as The First Ever Patented Prescription Drug in Hong Kong A Success Story of Hong Kong Innovation

A research team at the Department of Medicine, The University of Hong Kong Li Ka Shing Faculty of Medicine and Queen Marry Hospital (QMH) has spent a decade developing oral arsenic trioxide from a research project to a prescription medication that has secured a US patent. For the first time, a drug developed entirely in Hong Kong is poised to attain global status as a prescription medication. More than a hundred leukaemia patients in Hong Kong have been treated, the majority being cured by this novel drug. The work has been done by a small team of medical researchers, with the achievement based on ingenuity, meticulous work and diligence – a typical Hong Kong success story of innovation. This work is a historic landmark in medicine in Hong Kong.

Clinical applications of oral arsenic

The team has shown oral arsenic to be a safe drug. With appropriate dosing, the potential toxic effects of arsenic, particularly toxicity to the heart, have been overcome. Oral arsenic has been shown to be highly active in acute promyelocytic leukaemia, and has now become a standard in the initial treatment of some patients, in the continuous treatment of patients in remission, and for patients in relapse. More than 100 patients have since been treated, with excellent results. The use of oral arsenic has replaced bone marrow transplantation as the standard treatment for these patients. Oral arsenic has also been used in the treatment of other blood cancers, including lymphomas and myeloma.

The research team and Veristech Limited (the technology transfer company of the University of Hong Kong) have secured a US patent for the use of oral arsenic trioxide in the treatment of blood cancers in 2009. This is a historic event for two reasons. Oral arsenic is the first prescription drug ever to be developed in Hong Kong. It is also the first prescription drug in Hong Kong to secure a US patent.

Background and Development History

Oral arsenic was used in the Department of Medicine, QMH, for patient treatment in the late 1940s and early 1950s. However, newer drugs phased out oral arsenic, and its use was forgotten for nearly half a century. In 1998, a small team of medical researchers at QMH, began investigating the use of oral arsenic in the treatment of blood cancers, based on the successful use of intravenous arsenic trioxide in the treatment of acute promyelocytic leukaemia, first discovered in Harbin and

verified in Shanghai.

To determine the dosage and safety of oral arsenic, the research team initially turned to archival medical records retrieved from the Hong Kong Medical Museum. This was followed by two years of research into the method of preparation of the oral formulation. In 2000, the team successfully prepared an oral formulation of arsenic that was tested in a clinical study in blood cancer treatment. With demonstrated clinical efficacy, the research team in collaboration with Versitech Limited, filed an application for a US patent.

Global perspectives

With oral arsenic protected by intellectual property rights, Versitech will work on the global distribution of oral arsenic. On March 26, 2010, medical researchers and doctors from North America, Europe, Africa, Australia and Asia will converge on Hong Kong for the first international meeting organized by Hong Kong Society of Haematology on oral arsenic. The conference will focus on the discussion of global academic collaborations to further define the use of oral arsenic in the treatment of various malignant and non-malignant diseases. For details of the conference, please visit the website: http://asm2010.hksh.org

Humanitarian perspectives

Arsenic trioxide is available as an intravenous drug in the US. The cost is about 50,000 US dollars (400,000 HK dollars) a month. The prohibitive cost makes this potentially life-saving medication out of reach of leukaemia patients in developing countries. Oral arsenic is set to replace intravenous arsenic trioxide as the standard formulation. HKU is investigating the feasibility of making oral arsenic available on a compassionate basis to patients in developing countries, who face immense difficulties with drug costs, and the provision of in-patient hospital facilities and laboratory tests. Oral arsenic is very safe, and can be prescribed in the outpatient setting, obviating many of the medical problems in developing countries. A compassionate programme will save the lives of numerous underprivileged patients.

Paradigm of innovation in the Hong Kong spirit

Oral arsenic has been developed by a small team of dedicated researchers from the Department of Medicine, HKU and the Pharmacy Department of Queen Mary Hospital. It has taken years of hard work, without funding from any major government source. A combination of ingenuity, dedication, meticulous work, diligence and team work from doctors and patients has made the development of oral arsenic a success story true to the spirit of Hong Kong.

For news photos and powerpoint slides, lease visit the website at:
http://web3.hku.hk/facmed/hkumed/news_list.php

About HKU Versitech Ltd.

All the commercialization and business arrangements arising out of the technology transfer activities of the University are handled by Versitech Ltd, the commercial arm of the University of Hong Kong.

Versitech Ltd is a wholly-owned subsidiary of the University and it offers a full set of services in the following areas to ensure effective technology transfer for the University:

1. Training
organizes short courses and other training services.

2. Commercialization
commercializes the intellectual property of the University through licensing and collaboration with industry.

3. Contract Research and Consulting
Performs research and development activities funded by industry and government organizations to add commercial value to the intellectual capital assets of the University.

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新聞稿

二零一零年三月二十五日

港大成功研發口服砒霜 成為香港首隻專利處方藥物
締造香港創意工業的成功例子

香港大學李嘉誠醫學院內科學系及瑪麗醫院的一個研究小組用了十年時間，把口服三氧化二砷(即俗稱砒霜)由研究項目發展成為處方藥物，並成功取得美國國家專利。這是首隻完全由香港研發的處方藥物，勢將達到全球應用的地位。在香港，超過100位血癌病人已經接受這種治療，且大部份已康復和痊癒。這研究項目的成功建基於研究小組的創意和不懈努力，是香港創意工業的成功例子，亦是香港醫學史上一個重要的里程碑。

臨床研究治療數據

研究小組發現口服三氧化二砷是非常安全的藥物。若劑量適當，砒霜的潛在毒性會被解除，尤其是對心臟的副作用亦能大大減低。現時在急性粒子性白血病的治療中，口服三氧化二砷已是標準藥物，可提供持續治療及減輕患者病情，初發及復發的病人皆可服用。超過一百位白血病病人已經接受此項治療，並達到極優良的效果。在此等病症中，口服三氧化二砷已代替了骨髓移植作為最主要的治療方法。口服三氧化二砷亦應用於治療其他癌症，包括淋巴癌和多發性骨髓瘤。

2009 年，研究小組聯同港大科橋有限公司（香港大學的技術轉移公司），成功為口服三氧化二砷取得了美國國家專利，用於治療血癌。是次研究的成果是一個歷史性的成就，首先，口服三氧化二砷是首隻完全由香港研發的處方藥物，其次，這是首隻香港研發的處方藥物取得美國國家專利。

背景及發展經過

瑪麗醫院內科學系，早在 1940 年末至 50 年代初已使用口服三氧化二砷來治療疾病。隨著其他新藥物的發展，三氧化二砷的應用慢慢被取代，最後被遺忘了差不多半個世紀。直至 1998 年，哈爾濱和上海相繼出現運用靜脈注射三氧化二砷以治療急性粒子性白血病的成功個案，瑪麗醫院內科學系的一個研究小組遂重新開始研究口服三氧化二砷應用在血癌的治療。

研究人員首先參考了儲存在香港醫學博物館的舊病人資料檔案，以決定口服三氧化二砷的份量和安全度。繼後的兩年，研究人員嘗試了用不同的方法配製口服三氧化二砷。至 2000 年，研究小組成功研發了安全的口服三氧化二砷，並應用於臨床血癌治療研究。由於治療效果非常好，研究小組與港大科橋合作，共同為口服三氧化二砷申請了美國國家專利，並於2009年正式獲批。

全球視野

因為得到知識產權的保護，港大科橋現正規劃全球發行口服三氧化二砷。今年3月26 日，來自北美、歐洲、非洲、澳洲和亞洲的醫學專家將雲集本港，參與首個由香港血液科學會舉辦的口服三氧化二砷的國際研究會議。與會專家將集中討論口服三氧化二砷的國際學術研究合作項目，從而更加了解此藥物在治療癌症和其他疾病的功效。有關該國際會議的詳情，請瀏覽以下網址: http://asm2010.hksh.org

發展中國家的人道援助

在美國，靜脈注射三氧化二砷是這藥物的唯一配劑，但一個月的治療費用高達5萬美元 (約 40 萬港元)。由於藥物極度昂貴，發展中國家的血癌病人根本無能力負擔，我們期望口服三氧化二砷將代替注射三氧化二砷成為全球的治療新標準。由於發展中國家的病人無法支付龐大的藥物開支、昂貴的住院及檢查費用，香港大學現正研究為這些病人免費提供口服三氧化二砷。此人道援助項目將解決這些國家在應用三氧化二砷上遇到的許多醫療問題，並將拯救無數發展中國家血癌病人的性命。

香港創意精神的典範

口服三氧化二砷是由港大及瑪麗醫院內科學系研究小組和藥劑部，在完全沒有任何政府特別資助下，付出了多年時間和辛勤工作而獨力研發出來。這個項目的成功基於其獨創性，及研究人員的堅持、仔細和努力，以及醫護人員和病人的團結一致。這是香港創意精神的一個典範。

新聞圖片及記者會資料，請參考以下網址:
http://web3.hku.hk/facmed/hkumed/news_list.php

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