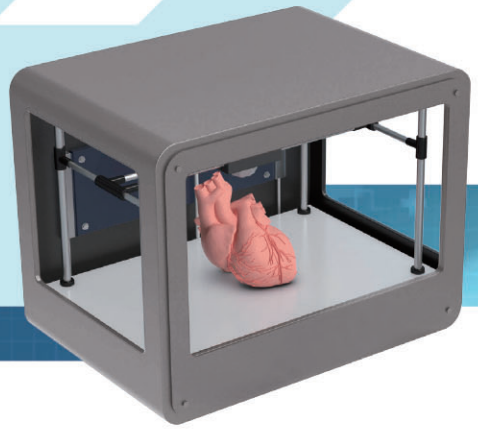
Hong Kong Museum of Medical Sciences Society
2018 Summer · No.23 2018年 夏季號

Medical Museum snapshot

香港醫學博物館 通訊



三維打印在醫學上的應用
3D Printing in Medicine

甚麼是三維打印？

三維打印是任何一種以電腦控制將材料續層「打印」出來並讓其接合固化而製成三維物體的過程。材料可以是液體、粉粒或纖維。

三維打印概念為製造業帶來的革新已令人興奮，在醫學領域上的可能用途更讓人驚喜。

從圖像到實物

要打印一個醫學模型，首先取得一幅電腦掃瞄或磁力共震掃瞄，或一幅三維掃描器獲得的圖像。接下來，使用三維重建軟件進行三維建模[1]，製作出所選病人身體部位或所掃描物件的三維數碼模型（包括顯示內部結構）。然後，將三維數碼模型導出至特殊處理軟件中進行編輯[2]，再導入打印機專用軟件[3]，將三維數碼模型切割成層並產生G代碼。這些G代碼指令三維打印機打印模型。

義肢及植入物

當應用於義肢時，三維打印能夠為患者度身定造義肢，更快捷更便宜。而且，使用的材料也比傳統材料更輕巧強韌，對病人非常有用。有些三維打印物料已獲准用作植入物或手術用具。利用這些物料，打印出來的義肢及用具經消毒後，便可在手術上使用，期間只需數小時。

（接後頁）

What is 3D printing?

3D printing is any of various processes under computer control in which material is laid down ("printed") in successive layers and fused together to create a 3D object. Different materials can be used, such as liquid molecules, powder grains, or filaments.

▲ 3D打印出來的盤骨模型作教學用途。
This is a printed pelvis model used for training workshop.

While the idea of 3D printing revolutionising the manufacturing industry is exciting, it's possibly even more exciting to consider the advances that might be made in medicine.

From image to object

To print a medical model, we begin with a CT- or MR-scanned image or an image obtained by a 3D scanner. Next, using a 3D Reconstruction software[1], generate a 3D digital model of the selected body part or that of the object scanned, including showing the internal structures. After this, the 3D digital model is exported into a special processing software[2] for editing, then imported into a Printer specific software[3] for slicing the 3D digital model into layers and generate G-codes. These G-code are commands that instruct the 3D printer to print the model.

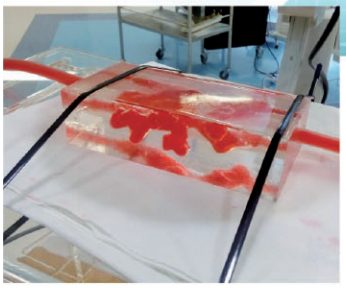
Prosthetics and Implants

When applied to prosthetic limbs, 3D printing can tailor-make these prostheses to exactly fit the patient. They can also be made more quickly and at lower cost. Moreover, the materials used may be lighter and stronger than those made by conventional means. These properties are extremely useful to patients. Some 3D printing materials have been approved for use in medical implants and surgical instruments. Such printed products can be sterilised and ready for use in surgery in just a few hours.

(Continue on next page)

3D printing (continued from frontpage)
三維打印 (接前頁)

培訓醫護專業人員



▲ Application in Urology Training

三維打印技術越來越多用於培訓醫護專業人員。傳統的培訓會在動物屍體或病人身上進行。動物屍體未能讓受訓者感覺到壓力、血流量和病人的動作及反應。以活生生的病人作培訓無論對病人或受訓者都非常冒險。今天婦科、泌尿科及骨科都已用三維打印人體解剖學的逼真模型作外科培訓。

麻醉科醫生及在深切治療部工作的醫生一般會為病人建立有效的血管通路，過程涉及將導管插入血管 (包括靜脈、動脈及直接流入心臟的中央靜脈)。雖然以超聲波引導，中央靜脈置管程序尤其充滿挑戰。三維打印出來的血管模型能幫助測試設備，以及讓醫生熟習程序。

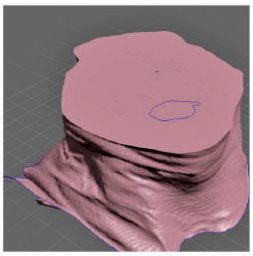
打印活組織

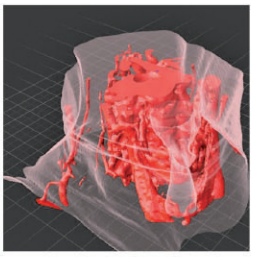
生物打印技術是一種利用三維打印來生產活組織和器官的技術。科學家已經能夠打印出一些模擬人體組織功能的活組織，例如：肝組織、平滑肌組織和內皮組織。

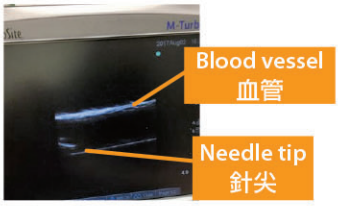
三維打印可以印出微小的網狀組織支架和細胞的培養基。活細胞可以包含在「生物墨水」裏，或印製成的組織支架可以用於組織培養。現時，生物打印技術最大的應用是在藥物測試，但隨著技術迅速發展，三維打印的活組織甚至器官將來終於可能植入有需要的患者。

三維打印技術對個人化醫療有巨大潛力。未來，藥物和治療或許可按需求被打印出來。

Training of healthcare professionals







3D printing is increasingly used in the training of healthcare professionals. Traditionally, training was carried out on dead animals or live patients. Dead animals cannot provide the necessary pressure, blood flow, and patient movements and responses for the trainees. Training on a live patient is too risky for both patient and trainee. Today, 3D printed life-like models of human anatomy are being used for surgical training in gynaecology, urology, and orthopaedics.

Anaesthetists and doctors working in intensive care units, generally establish effective vascular access for patients. This involves inserting catheters into blood vessels, including arteries and large central veins that drain directly into the heart. The latter procedure is particularly challenging even when ultrasound guidance is used. 3D printed blood vessel models can be used to test equipment as well as allow practice of the procedure.

Printing live tissues

Bio-printing is the use of 3D printing to create living tissues and organs. Scientists have for some time been able to print samples of live tissue that have human tissue function.

Tiny meshes that form the supporting structure of the tissue and the nutrient medium for the cells are printed. The cells can be included in the "bio-ink" or else the printed structure can be used for tissue culture. Examples of such tissues include liver, smooth muscle, and endothelial tissue. The greatest application is in drug testing, but as technology rapidly develops, printed tissue or even organs might eventually be available for implantation into patients in need.

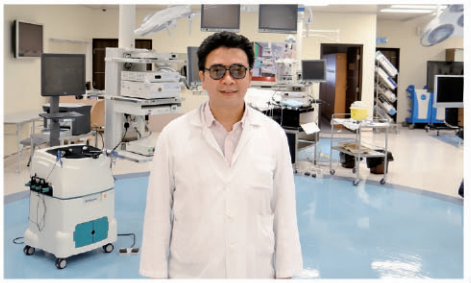
3D printing holds great potentials for personalised medicine. In future, medications and treatments may possibly be printed on demand.

1. such as Materialise Mimics, 3D Slicer, InVesalius, and OsiriX
2. such as AutoMixer, MeshLab, Geomagic Freeform, ZBrush, and Netfabb
3. such as Cura

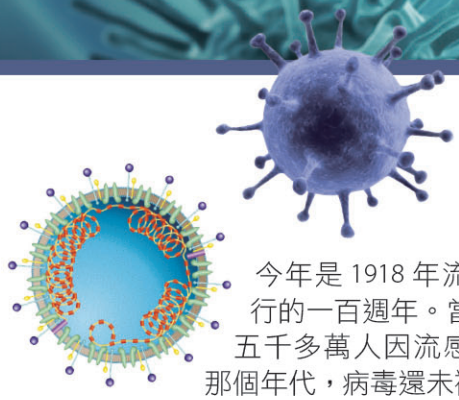
Carrison K.S. Tong graduated from Southampton Solent University in engineering and obtained his PhD in Medical Imaging at the Royal Postgraduate Medical School, Imperial College, UK. He has published in the area of medical imaging, modelling, 3D Visualization, and 3D Printing, and has filed two patents: Stereoscopic Visualization Systems for Robotic and Laparoscopic Surgeries and Dual Channel Stereoscopic Video Streaming Technique.

Dr. Tong is currently a Medical Physicist and a Picture Archiving and Communication System (PACS) Manager at Pamela Youde Nethersole Eastern Hospital. His assignments have won several local and international awards. The Filmless Hospital Project (the first in Hong Kong and PPRC) won the HKICT* Gold Award 2006, and the Surgical Virtual Reality Laboratory won the HKICT Grand Award 2008.

*HKICT Awards: 香港資訊及通訊科技獎 Hong Kong Information & Communication Technology Awards



CONTAGIOUS CITIES



今年是 1918 年流感大流行的一百週年。當年全球五千多萬人因流感死亡。那個年代，病毒還未被發現，治療有限，又沒有疫苗，預防只得靠公共衛生措施，如良好的個人衛生及隔離等。

今天，我們對預防流行病是否做好準備？

1894 年，香港爆發腺鼠疫，太平山區因衛生環境惡劣而成為重災區並且被摧毀。這場疫症促使政府推行衛生健康方面的改革，大力發展公共衛生，並為華人社區引入西方醫療服務。今天，香港是世界上最人煙稠密的城市之一，也是最健康的城市之一。

承蒙英國倫敦惠康基金會邀請，香港醫學博物館成為其國際合作項目《Contagious Cities》的合作夥伴之一。該項目帶出 3 個國際城市（紐約、日內瓦和香港）的市民與微生物在城市環境中的相互作用。

香港醫學博物館將講述太平山區鼠疫抗疫和改善公共衛生的故事。為此，博物館正為 2011 年開發的「太平山醫學史蹟徑」加緊搜集更豐富的資料，及開發流動應用程式，務求將昔日發生的情境活現當前。應用程式預計於 2019 年 1 月推出。

This year is the centenary of the 1918 flu pandemic which killed over 50 million people worldwide. In those days, viruses were not yet discovered. Treatment was limited. There were no vaccines. Prevention depended on public health measures such as good personal hygiene and isolation.

How prepared are we now for epidemics?

In 1894, bubonic plague devastated the unsanitary Taipingshan district of Hong Kong. The horror of this epidemic prompted sanitary reforms, development of public health, and the introduction of Western medical care for the Chinese community. Today, Hong Kong is one of the most populated cities in the world, but also one of the healthiest.

Invited by the Wellcome Trust, Hong Kong Museum of Medical Sciences (HKMMS) is one of the partners in their international collaborative project, 'Contagious Cities,' which features the interactions of people and microbes in the urban environment of 3 global cities: New York, Geneva, and Hong Kong.

HKMMS will tell the story of the plague and the public health improvements in the Taipingshan district. To do so, the Taipingshan Medical Heritage Trail, first developed in 2011, will be enriched, and a GPS-guided application will be developed to better **bring the story to life where it took place**. The app is expected to be launched in January 2019.

惠康基金會的 Contagious Cities 項目網站位於
The "Contagious Cities" project website is at
https://wellcome.ac.uk/what-we-do/our-work/contagious-cities
這網站將於 2018 年 9 月開始介紹香港太平山醫學史蹟徑。
This website will introduce The Taipingshan Medical Heritage Trail in September 2018.

◀1898 年的太平山區，在物業回收後房舍被清拆的區域
Area of Taipingshan which was resumed after the plague, with houses demolished, 1898

圖片來源 Source:：夢周文教基金會 Moonchu Foundation

Congratulations

Congratulations to

Professor Rosie TT Young, GBM, GBS, JP, Patron of Hong Kong Museum of Medical Sciences Society, who was recently awarded the Grand Bauhinia Medal (GBM) in recognition of her exemplary work in education and the medical field

恭喜！

醫學博物館學會贊助人楊紫芝教授獲頒授大紫荊勳章，以表揚她在公共衛生及教育方面的卓越貢獻

▲ Prof Rosie TT Young

Congratulations to

Dr Pamela MK Leung, BBS, JP, a Director of Hong Kong Museum of Medical Sciences Society, who was recently awarded the Bronze Bauhinia Star (BBS) in recognition of her distinguished public and community service, particularly her dedicated service throughout her career in the Hospital Authority and after her retirement.

恭喜！

醫學博物館學會董事梁明娟醫生獲頒授銅紫荊星章。以表揚她在公共及社會服務方面表現出眾，尤其是在醫院管理局任職期間，用心盡職，退休後仍繼續竭誠支持醫管局的工作。

▲ Dr Pamela MK Leung

「藝術 × 醫學」外展劇場

Arts & Medicine Outreach Theatre

香港話劇團 (HKREP) 為 15 間小學演出了一齣講述香港百年前鼠疫抗疫歷史的短劇。透過互動環節，昔日片段連結至今天環境，讓學生了解及反思，注意個人和環境衛生可以預防感染及抗疫。

參與的學校經 HKREP 指導後，將於 2019 年 3 月公演同學們自己創作的歷史短劇。

此項目是醫學博物館的一項新嘗試，與香港話劇團合作，由市區更新基金贊助。

In a short drama specially created for performance in 15 primary schools, the Hong Kong Repertory Theatre (HKREP) told the story of the Plague in Hong Kong and the battles fought against it 100 years ago. Interactive sessions helped students linked past with present, and reflect on how attention to personal and environmental hygiene can prevent infection and epidemics.

Few schools elected to undergo coaching by the HKREP to develop their own drama play. The students will perform to public audience in March 2019.

The project was a new initiative by the Medical Museum in collaboration with the HKREP and sponsored by the Urban Renewal Fund.

博物館活動花絮 MUSEUM ACTIVITIES SNAPSHOTS

鄭寶鴻先生以獨家珍藏照片，介紹中西區昔與今。
Mr Cheng Po-hung in a guided tour of Central & Western District then and now, using his exclusive collection of photographs.

梁以華建築師介紹鼠疫後建築物設計的背景及其在改善太平山區衛生環境上所扮演的角色。
Architect Mr Edward Leung explaining the design of buildings constructed after the Plague and their role in improving the health of the community in the Tai Ping Shan district.

政務司司長張建宗太平紳士參觀博物館在 2018 年香港國際檔案日的攤位。
Mr Mathew Cheung Kin-chung, GBM, GBS, JP, Chief Secretary for Administration, visiting the Museum's booth at the International Archive Day 2018.

博物館快將推出一個結合導賞路線及中草藥知識的應用程式。大家可根據程式內的路線漫步中西區，沿途設有不同的小題目加深歷史及建築特色。另外，藉「中藥園遊樂」可挑戰對中草藥的認知，亦可與博物館草藥園內的植物對照，非常有趣。

The Museum will launch a mobile app that includes guided tours in the Central & Western District, and medicinal plants in the Museum Herbal Garden very soon. Follow the routes to discover and learn more about history and architectural styles. Play the Herbal Garden Game and quiz yourself on your knowledge of Chinese herbal medicine.

建築復修技巧工作坊
Architectural Conservation Skills Workshop

木質及鋪瓦 TIMBER AND TILE

28 Jul 2018 (Sat)
香港醫學博物館
Hong Kong Museum of Medical Sciences

4 Aug 2018 (Sat)
荔枝窩村 (08:20於粉嶺港鐵站集合*)
Lai Chi Wo Village Arrived 8:20 am Sharp at Fanling Train Station, take bus 78k and Board at Sha Tau Kok Port. Must present HKID to apply closed permit via Hong Kong Countryside Foundation.

Registration via HKCF for this workshop.

鋪瓦 TILE

18 Aug 2018 (Sat)
香港醫學博物館
Hong Kong Museum of Medical Sciences

講者包括 SPEAKERS INCLUDE
(排名不分先後 Names in lesson order)

香港古建保育協會簡介：希望開展與其它古建保育工作的專業顧問團體溝通，交流相關復修工藝知識，並邀請各類復修工藝匠師合辦復修工藝工作坊及分享會以培育人才，為業界建立專業形象。

馬雲龍 Mr Daniel Ma
香港古建保育協會會長
HKHBCA Chairman

梁永基 Mr Woody Leung
建築保育研究員
Researcher, architectural conservation

馮偉強 Mr Fung Wai Keung
資深復修工藝匠師
Experienced conservator

吳日輝 Mr Hanny Ng
文物保育師
Architectural conservationist

$2,200 for three days pass; $800 per day pass, no refund once registered. All income donated to HKMMS and HKHBCA
全三堂二千二百元，單堂八百元，已報名交款恕不設退回。所有收入全數撥捐博物館及香港古建保育協會。

詳情及報名
Details & Registration

主辦機構 Organized by : 香港醫學博物館 Museum of Medical Sciences
合辦機構 Co-Organized by : The Hong Kong Countryside Foundation 香港鄉郊基金
支持機構 Supported by : HKHBCA
贊助機構 Sponsored by : 市區更新基金 Urban Renewal Fund

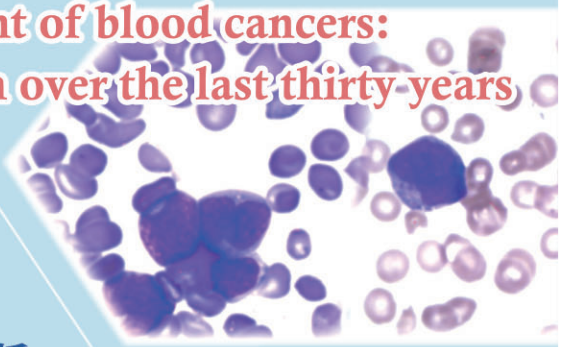
最新紀念品
NEW SOUVENIR

桌上遊戲《瘟疫危機》
Pandemic Boardgame $319

《瘟疫危機》是獨特而刺激的合作遊戲，適合 2-4 人參與，你和其他玩家將扮演抗疫小組的成員，前往世界各地控制傳染病蔓延，盡快合力研發療藥，致力遏止疫症爆發！

Pandemic is a special and exciting cooperative board game for 2 to 4 players. Each player is a disease-fighting specialist. Epidemics have broken out in different cities. It is only through teamwork that the players can develop the cures in time and prevent the diseases from spreading all over the world.

血癌的治療 — 三十年的演進
Treatment of blood cancers: evolution over the last thirty years

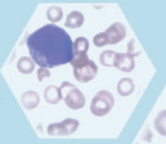


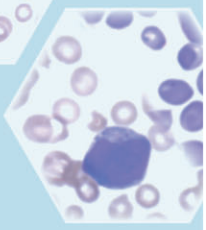
講者 Speaker:

鄺沃林教授
Professor Kwong Yok Lam

香港大學內科學系講座教授、
徐福全基金教授(分子醫學)
Chui Fook-Chuen Professor in Molecular Medicine,
Chair of Haematology and Haematological Oncology,
Department of Medicine, The University of Hong Kong

費用全免 - 歡迎參加
ALL ARE WELCOME





日期 Date: **4/8/2018** (星期六 Saturday)

時間 Time: **3:00 p.m. - 5:00 p.m.**

地點 Venue:

香港中環干諾道中二十一至二十二號華商會所大廈二樓
香港醫學會李樹培醫生專業教育中心
The Hong Kong Medical Association Dr. Li Shu Pui Professional Education Centre
2/F, Chinese Club Building, 21-22 Connaught Road Central, Hong Kong

報名及查詢 registration and enquiries:
2549 5123 (鄺小姐 Ms Kwong)　電郵 email: info@hkmms.org.hk

HKMMS Society

香港醫學博物館籌款晚宴2018
FUNDRAISING DINNER 2018

THURSDAY, 8 NOVEMBER 2018

Hong Kong Academy of Medicine

Guest of Honour
The Hon Joseph Yam Chi-Kwong, GBM, GBS, JP

Dinner Organizing Committee 2018
Chairman: Dr Duncan H.K. Ho
Members: Dr Henry C.L. Au-Yeung,
Mr Choong Yin-lee,
Mrs Yolanda Ho,
Ms Marisa Kwok,
Dr Roland Leung

Guest Performer 表演嘉賓
Mr Michael Hui & Mr Johnson Lee
許冠文先生及李思捷先生

Sponsorship enquiries : 2549 5123 Ms Amelia Chiang

Reservation & Details : www.hkmms.org.hk

ATTENTION MEDICS!
招募醫生

Hong Kong Museum of Medical Sciences is recruiting volunteer medical doctors to lead tours of the Taipingshan Medical Heritage Trail.

These tours introduce the medical history of Hong Kong to Year 1 medical students of The Hong Kong University and the Chinese University of Hong Kong. In view of the increased number of medical students in the coming academic year, many more medical doctor docents are needed.

TRAINING SESSION
Date & Time: 22 Sep 2018 (Saturday) 14:30 - 16:30
Venue: Hong Kong Museum of Medical Sciences & neighbourhood
Trainers: Professor Faith CS Ho, Dr Wong Tai-Wai

If you are interested, please contact Ms Kwong at 25495123 or by email at dorothykwong@hkmms.org.hk before 14 September 2018.

COME AND SUPPORT MEDICAL EDUCATION !

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館長 Curator
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博物館資訊 Museum Information

開放時間
星期二至六　早上10時至下午5時
星期日及公眾假期　下午1時至5時

Opening Hours
Tuesday to Saturday　10 am to 5 pm
Sunday and Public Holidays　1 pm to 5 pm

入場門票
$20　成人
$10　小童、全日制學生、六十歲以上長者或殘疾人士
$50　家庭套票 (包括兩位成人及最多三位小童使用)

Admission Fee
$20　Adults
$10　Children, full-time students, senior citizens (aged 60 or above) and disabled persons
$50　Family Package (2 adults and maximum of 3 children)

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MUSEUM OF MEDICAL SCIENCES 香港醫學博物館

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