ARAB HEALTH

25 - 28 JANUARY 2016

PRESENTS

3D MEDICAL PRINTING

Join us at Arab Health for an immersive 3D printing experience and find out first-hand how the technology is set to revolutionise the healthcare industry.

Would you like to take part or require further information?
Contact us 3dmp@informa.com or +971 4 4072793

www.3dmedprinting.com

ARAB HEALTH 3D PRINTING ZONE 25 - 28 JANUARY 2016

Revolutionary thinking inspires revolutionary technologies and techniques. Join us at Arab Health for an immersive 3D printing experience and find out first-hand how the technology is set to revolutionise the healthcare industry.

The 3D printing zone is a unique open space which has been devised as a dedicated educational experience for all who are interested in learning about the latest 3D technologies entering the MENA market for the first time.

Here you can observe and learn from the pioneers in the field of 3D bioprinting with:
- hands-on activities
- interactive demonstrations
- face-to-face conversations with those who bring these technologies to life

The 3D printing zone at Arab Health will bring together the companies that are at the forefront of developing, and successfully commercialising, this groundbreaking technology.

From leading research groups to pioneering technology companies, the 3D printing zone at Arab Health will bring innovation to a brand new audience.

3D PRINTING CONFERENCE 26 - 27 JANUARY 2016

In order to expand on the educational component around 3D printing, the Arab Health Congress will also host the first *3D Printing Conference*.

The conference will take a closer look into the potential impact of 3D Printing in healthcare, with a focus on:
- surgical applications for 3D printing
- 3D printing for drug discovery
- bioprinting and vascularization
- a look at the legal and ethical debates surrounding this technology

IN ASSOCIATION WITH:

Cincinnati Children's · Cleveland Clinic · Mount Sinai · University & Research Hospitals · Harvard University · Heriot-Watt University · Stanford University

Technische Universität Dresden · UCLan · 3D Tech · envisionTEC · Materialise · Stryker · Jacky's · Artec 3D

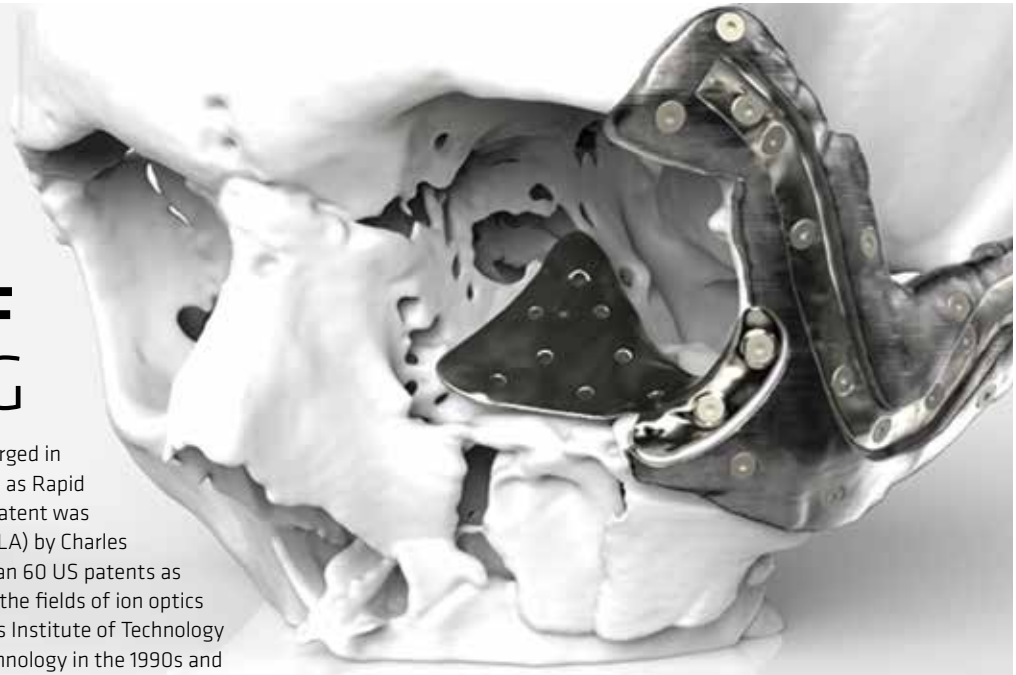
BigRep · Concept Laser · MakerBot · mcor technologies · Stratasys · open bionics · e-NABLE

SUPPORTING BODIES:

Government of Dubai · Dubai Health Authority · Health Authority · Dubai Healthcare City Authority

ORGANISED BY:

informa life sciences exhibitions



HISTORY OF 3D PRINTING

The earliest 3D printing technologies emerged in the late 1980s when they were referred to as Rapid Prototyping (RP) technologies. The first patent was issued for stereolithography apparatus (SLA) by Charles W. Hull, who later was named on more than 60 US patents as well as other patents around the world in the fields of ion optics and rapid prototyping. The Massachusests Institute of Technology (MIT) was also an early pioneer of the technology in the 1990s and both continue to bring innovative products to the market. Today, the technology continues to improve and the processes are getting faster and materials are getting cheaper.

The medical sector is viewed as an early adopter of 3D printing, but also a sector with huge potential for growth, due to the customisation and personalisation capabilities of the technologies and the ability to improve people's lives as the processes improve and materials are developed that meet medical grade standards. Technology is also being developed for the 3D printing of skin, bone, tissue, pharmaceuticals and even human organs.

> "Development of medical technologies and life science must promote human health and protect human life all over the world both at present and future."

Professor Makoto Nakamura, Professor, The University of Toyama.
By 2008, Professor Nakamura had created a working bioprinter that can print out biotubing similar to a blood vessel.

TIMELINE

1989 — Commercialised 3D printing with stereolithography printer

1992 — 3D Systems invented Selective Laser Sintering (SLS) printing and was the first to commercialize it

1999 — first lab grown organ implanted in a human using 3D synthetic scaffold

2002 — first miniature functional kidney in animal

10 THINGS WE CAN PRINT IN MEDICINE RIGHT NOW

TRACHEA GRAFT

A team of researchers from Icahn School of Medicine have combined 3D printing technology with human stem cells to create the first successful 3D-printed biologic tracheal graft in an animal model. Using a biocompatible polymer, researchers created a customized 3D-printed tracheal graft seeded with stem cells. The graft was then used to repair a defect in an animal. The Mount Sinai team continues to work toward creating a customized tracheal graft that could be used to repair complex airway defects in humans.

LIVER MAKES SURGERY SAFER

A new method of 3D printing an anatomically accurate replica of the human liver is now helping to guide surgeons during tricky procedures. The 3D-printed replicas, which are made of transparent material threaded with coloured arteries and veins, could help surgeons prevent complications when performing liver transplants or removing cancerous tumors, researchers said. "We provide the surgeons with a physical model that is 100% identical to what they will encounter in surgery when they operate," said Dr. Nizar Zein, the chief of hepatology at the Cleveland Clinic in Ohio. "It takes away some of the potential surprises that will be found at the time of surgery."

SAVES YOUNG HEARTS

In Nicklaus Children's Hospital in Miami, paediatric cardiovascular surgeons use patient specific heart models to guide them in complex surgeries. 100% accurate 3D printed models allow them to perform challenging operations, often for children who have nowhere else to turn. The technology becomes increasingly popular in hospitals and research centres around the world.

THYROID GLAND

The first ever thyroid gland for an animal – a mouse – was printed using the patented bioprinting process of Russia-based company called 3D Bioprinting Solutions. The goal here was to print a thyroid gland which could then be transplanted into a living mouse in order to further evaluate its capabilities.

SPLINT SAVES BABY'S LIFE

Recently, surgeons at the University of Michigan's C.S. Mott Children's Hospital implanted 3D-printed splints to open up the airways of 18-month-old Garrett Peterson. It was one of the first times the 3D printed splints were used to save a life.

BODY ON A CHIP

The Wyss Institute at Harvard and the Wake Forest Institute of Regenerative Medicine have been leading research into "body on a chip" or "organs on a chip" than can use a 3D printing process. The process involves extruding human cells onto a two-inch chip to create tiny organ-like structures that mimic the function of the heart, liver, lung and blood vessels. The "body on a chip" technology can be used to test everything from pharmaceuticals to a chemical warfare agent's effects on humans. Along with the two universities, public sector companies including GlaxoSmithKline and Organovo have also been performing research on 3D-printed tissue technology.

CRANIUM REPLACEMENT

Surgeons at the University Medical Center at Utrecht University in The Netherlands used this 3D-printed skull to save a woman's life by replacing her own skull, which was suffering from a condition that caused it to thicken to three times its normal size. The thickening skull was placing pressure on the woman's brain, and had already caused her to lose her vision and suffer from impairment of motor skills. Until 3D printing, "there had been no effective treatment for such patients", the brain surgeon stated in a press release.

BONE MODELS AND SURGICAL GUIDES

The Chinese University of Hong Kong's Prince of WalesHospital bones up for upcoming surgeries by 3D printing bone models and surgical guides with its 3D production system. Prototyping has improved surgeries, increased research and development, and saved costs.

HEARING AIDS

The hearing aid industry boasts perhaps the highest "installed base" of customized final consumer devices that were produced using 3D printers. The technology allows the use of a wide range of materials that enables the hearing aid manufacturer to offer a custom patient solution in terms of both fit and skin coloration.

SYNTHETIC SKIN

James Yoo at the Wake Forest School of Medicine in the US has developed a printer that can print skin straight onto the wounds of burn victims. With the ability to scan a wound, the printer can then fabricate the appropriate number of skin layers to fill the wound.

2005 – open source initiative RepRap founded to build 3D printer

2006 – the first SLS (selective laser sintering) machine becomes viable

2008 – RepRap Project releases Darwin, the first self-replicating printer that is able to print the majority of its own components

2008 – the first person walks on a 3D-printed prosthetic leg printed in the same complex structure without any assembly

WHAT IS THE FUTURE OF 3D PRINTING IN MEDICINE?

ORGANS

While an entire organ has yet to be successfully printed for practical surgical use, scientists and researchers have successfully printed kidney cells, sheets of cardiac tissue that beat like a real heart and the foundations of a human liver, among many other organ tissues. One exciting step towards printing human organs comes from the University of Florida where researchers have developed a way of printing complex objects in gel, a method that could help pave the way to 3D-printed organs in the future. The gel here, which is made of an acrylic acid polymer, acts as a scaffold to hold the structure in place during the printing process. That approach has already allowed the team to print with organic materials – and even make a replica of a human brain.

STEM CELLS

Stem cells have amazing regenerative properties and they can reproduce many different kinds of human tissue. Now, stem cells are being bioprinted in several university research labs, such as the Heriot-Watt University of Edinburgh. Stem cell printing was the precursor to printing other kinds of tissues, and could eventually lead to printing cells directly into parts of the body.

CANCER RESEARCH

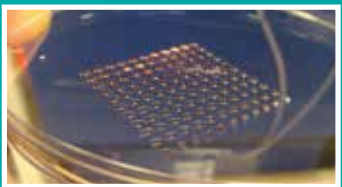
In the same way that tissue and types of organ cells are being printed and studied, disease cells and cancer cells are also being bioprinted. Such medical engineering would allow for better drug testing, cancer cell analysing and therapy development. With developments in 3D and bioprinting, it may even be a possibility within our lifetime that a cure for cancer is discovered.

PHARMACEUTICALS

The FDA recently approved the first 3D-printed prescription drug, essentially validating the technology as a new heavyweight player in big pharma. The purpose of drug development should be to increase efficacy and decrease the risk of adverse reactions, a goal that can potentially be achieved through the application of 3D printing to produce personalised medications.

PERSONALISED DIGITAL HEALTHCARE

One of the most exciting future opportunities for 3D printing growth comes from the emergence of 'digital healthcare', where patients are benefiting from new automated scanning and diagnostic processes. This personalised digital data is providing the blueprint for future 3D printed healthcare solutions.



2009

MakerBot Industries, an open-source hardware company for 3D printers, starts selling DIY kits that allow buyers to make their own 3D printers and products

2009

bioprinting innovator Organovo uses a 3D bioprinter to print the first blood vessel

2012

doctors and engineers in the Netherlands use a 3D printer made by LayerWise to print a customized three-dimensional prosthetic lower jaw

2013

Organovo becomes world's first publicly traded bioprinting company

3D MEDICAL
PRINTING CONFERENCE

Book and pay before 3 December 2015 and **save up to US$155**

Dear Healthcare Professional,

I am pleased to present you with this new and exciting **3D Medical Printing conference** programme taking place on **26-27 January 2016** at the Dubai International Convention and Exhibition Centre.

A new addition to the Arab Health congress and a new field in the world of medicine, this forward looking and thought provoking conference will showcase real life case studies where 3D printing is revolutionizing patient care and transforming the way surgical procedures are being carried out. An elite hand-picked selection of speakers from across the globe will highlight and discuss the importance of 3D printing for future medical practices.

This one of a kind program is by invite only and also features its own dedicated 3D medical printing exhibition area where delegates can see first-hand the 3D printers in action..

See you in January!

Yours sincerely,

Sally Thompson
Head of Production
Informa Lifesciences

P.S. Contact our team directly to learn more about our group discounts and early bird rates. Call +971 (0) 4 336 7334 or email ahcongress@informa.com

HIGHLIGHTS:

- Discover how to carry out 3D printing vascularized tissues
- Explore 3D Medical Printing Case Studies: learn about the first 3D printed thyroid gland
- Discuss and debate robotic surgery, airways, and 3D Printing in the biomedical area

---

THE ARAB HEALTH CONGRESS 2016 FEATURES 20 CONFERENCES
For more information about other conferences, ***visit www.ahcongress.com***

3D MEDICAL PRINTING CONFERENCE

26TH-27TH JANUARY 2016

DAY ONE: TUESDAY 26 JANUARY

10:30 Chair's opening remarks
Nizar Zein, Chairman, Global Patient Service, Mikati Foundation Endopwed Chair and Chief of Hepatology, **Cleveland Clinic, Cleveland, Ohio, USA**

SESSION ONE: SMART BIOINKS

10:40 Opportunities and challenges of 3D printing in healthcare
Dr Homero Rivas, Innovative Surgery Director, Medicine School, **Stanford University, California, USA**

11:10 Extrusion-based 3D printing of biomaterials and living cells: towards relevant medical applications
Professor Michael Gelinsky, Head of the Center for Translational Bone, Joint and Soft Tissue Research, **University Hospital of Dresden University of Technology, Dresden, Germany**

11:40 Cell and DNA Printing
Dr. Will Shu, Associate Professor in Microengineering School of Engineering and Physical Sciences, **Heriot-Watt University, Edinburgh, UK**

12:10 Networking lunch and Visit 3DMP Zone

SESSION TWO: 3D PRINTING: TISSUES AND MEDICINE

13:40 3D printing of pharmaceutical tablets: new opportunities for personalising dosage forms
Dr Mohamed Albed Alhnan, Lecturer in Pharmaceutics, School of Pharmacy and Biomedical Sciences, **University of Central Lancashire, Preston, UK**

14:10 Preoperative 3D-model planning in percutaneous transcatether implantation of pulmonary valves
Professor Mario Carminati, Head of the Pediatric Cardiology Unit, **Policlinico San Donato, Milan, Italy**

14:40 Coffee Break

15:25 3D printing vascularized tissues
David Kolesky, PhD Candidate, 3D Printing Tissues, Functional Materials, **Harvard University, Cambridge, MA, USA**

15:55 Case study: the first 3D printed thyroid gland
Vladimir Miranov, Chief Scientific Officer, **3D Bioprinting Solutions, Moscow, Russia**

16:25 Close of day one
Visit the 3D Medical Printing Zone

DAY TWO: WEDNESDAY 27 JANUARY

SESSION THREE: SURGICAL APPLICATIONS I

10:00 Chair's opening remarks
Nizar Zein, Chairman, Global Patient Service, Mikati Foundation Endopwed Chair and Chief of Hepatology, **Cleveland Clinic, Cleveland, Ohio, USA**

10:15 3D Printing in surgical planning
David L. S. Morales, Chief of Cardiovascular Surgery, Heart Institute, Cardiothoracic Surgery, and Professor of Pediatric Surgery, **Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio, USA**

10:45 3D Printing of Liver for Surgical Planning in Liver Transplant Resection of Complex Liver Tumors
Nizar Zein, Chairman, Global Patient Services, Mikati Foundation Endowed Chair and Chief of Hepatology, **Cleveland Clinic, Cleveland, Ohio, USA**

11:15 Smart guide for spine surgery: from bench to operating theatre
Alpaslan Senkoylu, MD, Professor of Orthopaedics and Traumatology, **Gazi University, Ankara, Turkey**

11:45 Coffee break

SESSION FOUR: SURGICAL APPLICATIONS II

12:15 3D Printing a bioengineered trachea: from bench to bedside
Dr Faiz Y. Bhora, MD, FACS Chief of Thoracic Surgery, **Mount Sinai Roosevelt and Mount Sinai St. Luke's Hospitals, New York, USA**

12:45 Surgery "no more" in the management of Achalasia (Endoscopic Management of Esophageal Achalasia / POEM)
Dr Homero Rivas, Innovative Surgery Director, Medicine School, **Stanford University, USA**

13:15 Networking lunch and Visit 3DMP Zone

SESSION FIVE: THE FUTURE OF 3D MEDICAL PRINTING

14:30 3D printing a helping hand
Samantha Payne, COO, Open Bionics, Bristol, UK

15:00 FDA and other regulatory considerations for 3D Printing
David Amor, Principal, Medgineering, **Minneapolis, Minnesota, USA**

15:30 Interactive panel discussion: transforming healthcare through 3D printing
Dr Faiz Y. Bhora, MD, FACS is Chief of Thoracic Surgery at Mount Sinai Roosevelt and Mount Sinai St. **Luke's Hospitals, New York, USA**
Dr Homero Rivas, Innovative Surgery Director, **Medicine School, Stanford University, USA**
Samantha Payne, COO, Open Bionics, **Bristol, UK**
Vladimir Miranov, Chief Scientific Officer, 3D Bioprinting Solutions, **Moscow, Russia**
Alpaslan Senkoylu, MD, Professor of Orthopaedics and Traumatology, Gazi University, **Ankara, Turkey**

16:30 Chair's closing remarks
Nizar Zein, Chairman, Global Patient Services, Mikati Foundation Endowed Chair and Chief of Hepatology, Cleveland Clinic, **Cleveland, Ohio, USA**

16:45 Close of conference

SPEAKER FACULTY

Conference chair:

Nizar Zein, Chairman, Global Patient Services, Mikati Foundation Endowed Chair and Chief of Hepatology, **Cleveland Clinic, Cleveland, Ohio, USA**

Speakers:

Alpaslan Senkoylu, MD, Professor of Orthopaedics and Traumatology, Gazi University, **Ankara, Turkey**

David L. S. Morales, Chief of Cardiovascular Surgery, Heart Institute, Cardiothoracic Surgery, and Professor of Pediatric Surgery, **Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio, USA**

David Kolesky, PhD Candidate, 3D Printing Tissues, Functional Materials, Harvard University, C**ambridge, MA, USA**

Dr Faiz Y. Bhora, MD, FACS, Chief of Thoracic Surgery, **Mount Sinai Roosevelt and Mount Sinai St. Luke's Hospitals, New York, USA**

Dr Homero Rivas, Innovative Surgery Director, Medicine School, **Stanford University, California, USA**

Professor Mario Carminati, Head of the Pediatric Cardiology Unit, **Policlinico San Donato, Milan, Italy**

Professor Michael Gelinsky, Head of the Center for Translational Bone, **Joint and Soft Tissue Research, University Hospital of Dresden University of Technology, Dresden, Germany**

Dr Mohamed Albed Alhnan, Lecturer in Pharmaceutics, **School of Pharmacy and Biomedical Sciences, University of Central Lancashire, Preston, UK**

Samantha Payne, COO, Open Bionics, **Bristol, UK**

Vladimir Miranov, Chief Scientific Officer, **3D Bioprinting Solutions, Moscow, Russia**

Dr. Will Shu, Associate Professor in Microengineering School of Engineering and Physical Sciences, **Heriot-Watt University, Edinburgh, UK**

5 WAYS TO REGISTER:

+971 4 336 7334

+971 4 336 4021

ahcongress@informa.com

www.ahcongress.com

Informa Exhibitions,
P.O. Box 9428, Dubai, UAE

You can register online at www.ahcongress.com using your priority booking code: **3DM16CB**

Hotel and accommodation details

Please contact: Hospitality department
Tel: +971 4 407 2693
Fax: +971 4 407 2517
Email: hospitality@informa.com

Due to unforeseen circumstances, the programme may change and Informa Exhibitions reserves the right to alter the venue and/or speakers.

Cancellation

If you are unable to attend, a substitute delegate will be welcome in your place. If this is not suitable, a 50% service charge will be payable. Registrations cancelled less than 14 days before the event will not be refunded.