

Print Edition

New teaching resource boosts anatomy learning experience

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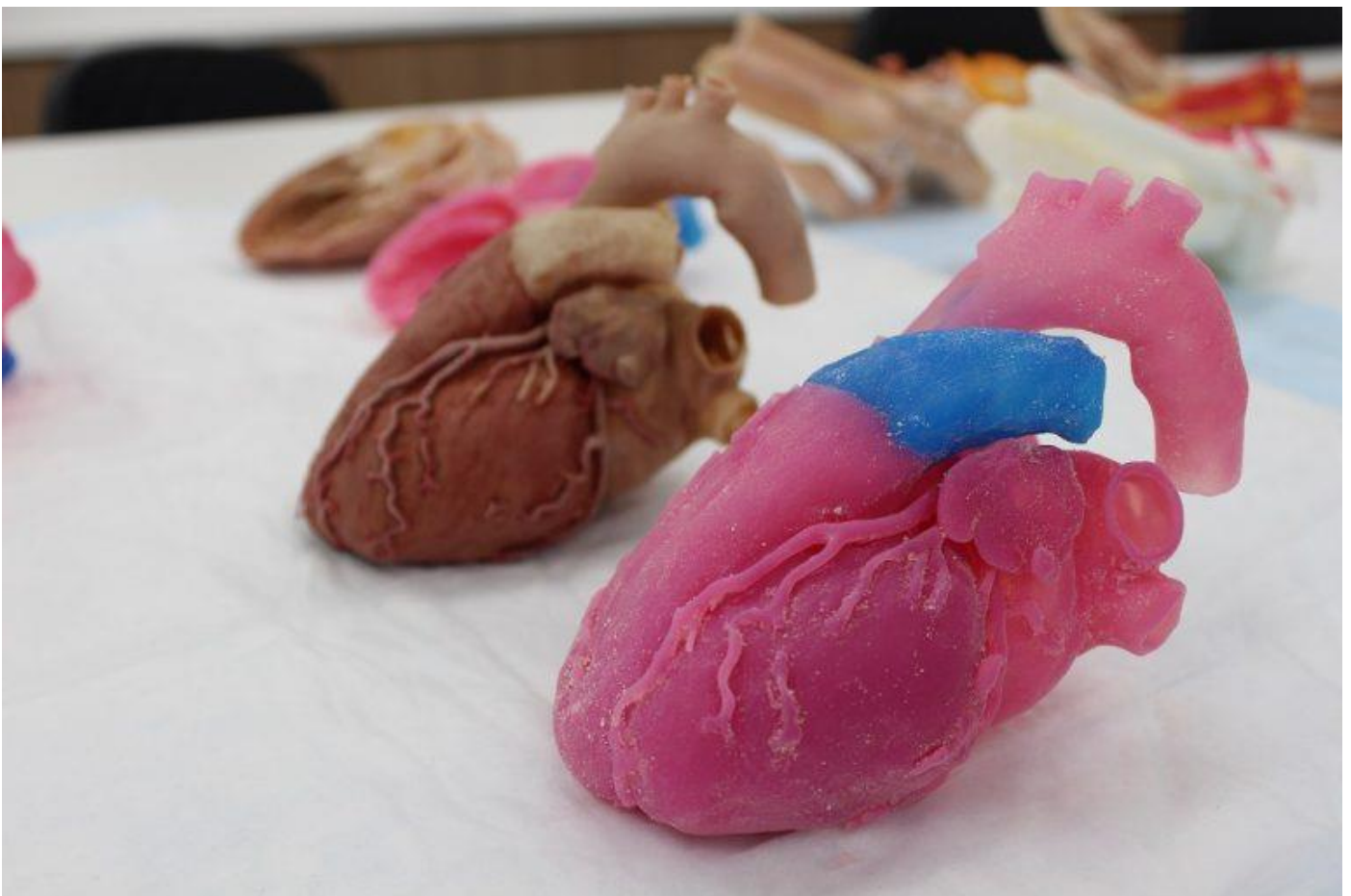
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A 3D-printed heart alongside the original plastinated specimen. The 3D-printed hearts were used for the first time in teaching this year

Singapore – Medical students at the Lee Kong Chian School of Medicine (LKCMedicine), a joint medical school set up by Nanyang Technological University, Singapore and Imperial College London, now benefit from even more hands-on time with anatomical specimens, thanks to the introduction of a novel teaching resource.

Complementing the School's extensive range of plastinated specimens, these 3D-printed replicas are the brainchild of head of anatomy Assistant Professor Sreenivasulu Reddy Mogali, who noticed a gap in existing anatomy teaching resources. "We wanted to create an affordable and accessible source of anatomically correct specimens that mimic the touch and feel of human tissues. And 3D-printing technologies offered exciting new opportunities for us to explore this idea," he said. The first 3D-printed models were used as a supplementary teaching resource in the Year 1 curriculum this year.

The project is a collaboration with NTU's Singapore Centre for 3D Printing. Using CT imaging technology to capture each specimen's unique features, Prof Reddy and his team painstakingly identified and labelled each structure before passing the information on to Assistant Professor Yeong Wai Yee, Programme Director (Aerospace & Defence) at the Centre, and her team who then worked on blending colours and combining soft elastomers with rigid plastics to create colours and textures that are as close to real human tissues as possible.

Unlike powder-based 3D-printed models, these multi-material and haptic models are flexible, allowing students to explore underlying structures without fear of causing damage. And even if a specimen is damaged, it can easily and quickly be reprinted.

For instance, a whole plastinated upper limb costs about S\$12,000, while a 3D-printed version, excluding the cost of the printer and SC3DP's expertise, comes in at a tenth of the amount. "3D-printed specimens are relatively cheaper, and can be reprinted when necessary," Asst Prof Reddy said.

An added advantage is that larger body parts, such as the upper and lower limb, can be printed in easy-to-handle sections, such as the shoulder, elbow, and hand and wrist.

The 3D-printed specimens, however, can only act as a supplementary teaching tool for now, and are unlikely to replace plastinated specimens at the medical school. Aside from looking less like a human body in terms of colour (for now), Asst Prof Reddy said that plastinated specimens help teach students empathy, an important quality in doctors.

He said, "When students do dissection or interact with plastinated specimens, they don't just learn about the anatomical intricacies of the human body. They also learn how to approach the specimen with empathy, respecting the human body, learning about life and death – a core part of training empathetic, patient-centred doctors."