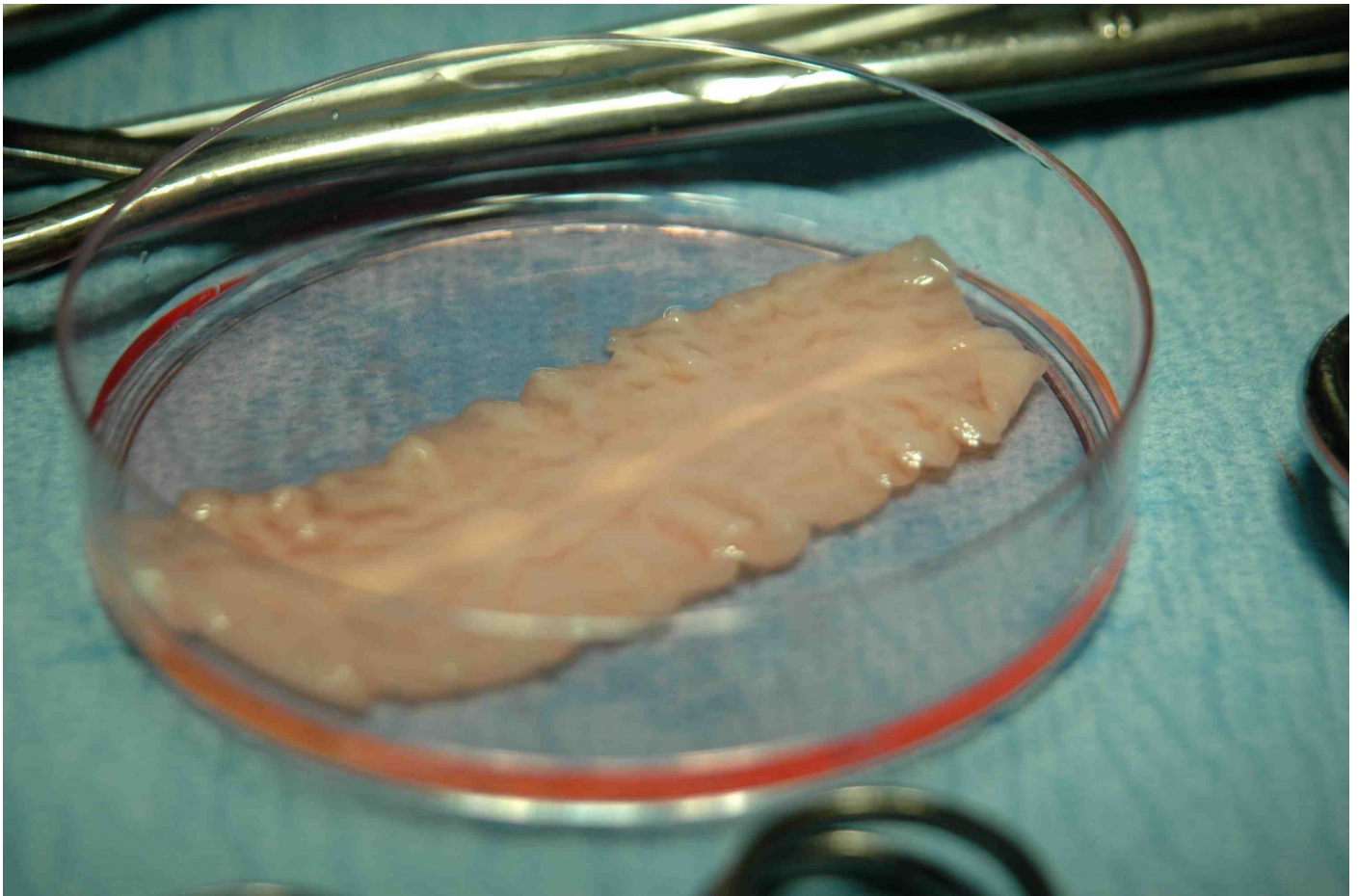


Healthcare industry BW

New trachea made from human tissue

A team of doctors from the Schillerhöhe Hospital, which is part of the Robert Bosch Hospital in Stuttgart, in cooperation with researchers from the Fraunhofer Institute of Interfacial Engineering and Biotechnology IGB in Stuttgart, has developed a method that enables artificially produced autologous tissue to be implanted into patients with severe tracheal injuries. The method involves the cultivation of extensive parts of the human trachea and subsequent surgical implantation.

"The new method is a breakthrough in the treatment of tracheal defects and injuries," explains Dr. Godehard Friedel, chief physician at the Department of Thoracic Surgery at the Schillerhöhe Hospital, who has been working on the development of the innovative method with Prof. Dr. Heike Mertsching, Head of the Department of Cell Systems at the Fraunhofer Institute of Interfacial Engineering and Biotechnology IGB in Stuttgart. "Previously, it was only possible to treat small tracheal defects. Larger defects could not be treated since it is impossible to use artificial prostheses or donor organs as tracheal replacements. The new method involves the development of implants from the patients' own (autologous) tissue, which also prevents the rejection of the tissue grafts."



Tracheal tissue produced with a method developed by Fraunhofer IGB.
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The graft is made from a piece of pig intestine, which is depleted of all animal cells, leaving behind a cell-free scaffold, the composition of which is very similar to that of human tissue. "Cells obtained from the patient's upper thigh are grown on this matrix," explained Dr. Mertsching. The cells, which are cultivated in special bioreactors for about four to five weeks, develop into tracheal tissue and contain blood vessels that can be connected with the patient's blood circulation during surgery.

"For patients with severe tracheal defects - caused by accidents or tumours for example - there was previously no prospect of surviving without permanent intensive care provided by hospitals," said Dr. Thorsten Walles, physician at the Schillerhöhe Hospital who was involved in the advancement of the bioartificial tissue graft in cooperation with the Fraunhofer Institute. "The first patient, who had suffered a serious chemical burn of the trachea, was treated with the new method and was able to leave hospital eight days after transplantation of the bioartificial tissue segment. He has since been able to breathe and speak without the need for a tracheal incision. Follow-up examinations have shown that the bioartificial tracheal tissue has grown in without problems. Our goal is to offer the new treatment method to other patients who could not previously be treated with established medical treatment methods."

Physicians from the Robert Bosch Hospital in Stuttgart and scientists from the Fraunhofer Institute of Interfacial Engineering and Biotechnology IGB in Stuttgart have been working together on the development of a method for the treatment of tracheal defects since 2004. The German Federal Ministry of Education and

Research (BMBF) has been funding a clinical trial conducted by the Schillerhöhe Hospital with funds from the government's "Development and Validation of Regeneration Technology Methods and Processes for Medical Applications" since July 1st 2009. Since the 1990s, physicians, biologists, engineers and other scientists from all over the world have been working together on the development of tissue engineering methods to produce artificial human tissue for the repair or replacement of defective body tissues.

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