Eyesight from a 3D Printer

Printing a new cornea during an operation to restore a patient's eyesight: This groundbreaking step in the fight against corneal disorders is set to become reality with a laser based process using personalized bioink. The method was developed by researchers at the Karlsruhe Institute of Technology (KIT) in collaboration with Carl Zeiss Meditec AG and Evonik Healthcare. Their project won the idea award in this year's NEULAND innovation contest.

When the cornea becomes deformed or loses its transparency, vision is seriously impaired. Corneal disorders are a typical phenomenon of old age, and increasing numbers of people in our aging population suffer from them. The 3D printing of personalized corneas during surgery is the aim of the "VisioPrinTech" process, a pioneering new solution under development by a team of researchers headed by Professor Ute Schepers at the Institute of Functional Interfaces and the Institute of Biological and Chemical Systems at KIT. "Instead of being dependent on cornea donations, we're using bioink made from the patient's own stem cells and chemically modified collagen fibers," Schepers said. "With our laser-based process, we can precisely position these cells to generate transparent and functional corneas with minimal risk of rejection." The method is set to provide a promising alternative to conventional transplantations and is also a crucial step toward personalized medicine. In a project involving industry partners, the next step will be to scale up the technology with initial production and testing in small batches.

The Best Innovations from KIT

In addition to VisioPrinTech, two other innovative projects won awards in the NEULAND innovation contest. The RareCycle project investigating magnetochromatography for the future of rare earth recycling won the silver medal. The project involves a method that will revolutionize the recycling of rare earth metals and could be used in a wide range of industries. Another award went to the HoStaBau project on wood-steel hybrid construction methods for sustainable transformation of the construction industry. The awards ceremony took place at KIT's Innovation Day on June 12, 2024.

About the NEULAND Innovation Contest

For the 12th time, KIT called on its researchers and doctoral students to present the innovative projects resulting from their research activities. In addition to a chance to win cash prizes totaling 9000 euros, the best ideas are accompanied during the transfer process by KIT innovation managers.

Press release

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Further information

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