Website address:
https://www.gesundheitsindustrie-bw.de/en/article/press-release/carl-zeiss-foundation-supports-early-career-research-group-biohybrid-neuroimplants

Carl Zeiss Foundation supports early career research group for biohybrid neuroimplants

Dr Simon Binder has been awarded a five-year, 1.5 million euro grant from the Carl Zeiss Foundation for his research into novel neuroimplants. Binder will establish the early career research group 'Biohybrid Neuroimplants based on Soft Hydrogel Electrodes' at the University of Freiburg.

It is affiliated with the research institutions BrainLinks-BrainTools, the Freiburg Center for Interactive Materials and Bioinspired Technologies (FIT) and the Faculty of Engineering at the University of Freiburg.

Controlling prostheses with thoughts or making letters appear on a screen: neuroimplants are brain-computer interfaces – the tiny electrodes can read brain activity and thus help people with paralysis and neurological disorders, for example. Dr Simon Binder studied electrical engineering and information technology at the Technical University of Darmstadt and the Dresden University of Technology. After completing his doctorate, he worked for several years as a postdoc at the University of Utah. He chose the University of Freiburg as the research location for the early career research group. The project starts in February 2025 and will be funded for five years.

"We are very pleased to welcome Simon Binder to the University of Freiburg and to have him establish a new interdisciplinary research group that is dedicated to the development of neuroimplants with biohybrid electrodes," says Prof. Dr.Thomas Stieglitz, Professor of Biomedical Microtechnology and co-spokesperson for BrainLinks-BrainTools at the University of Freiburg. The early career research group particularly benefits from the scientific environment as it is linked to the research facilities BrainLinks-BrainTools, the Freiburg Centre for Interactive Materials and Bioinspired Technologies (FIT) and the Faculty of Engineering at the University of Freiburg.

Improved biocompatibility through a better design of neuroimplants

The researchers are developing an innovative connection between the brain and electronic devices by incorporating specially cultured cells into the neuroimplant. These cells are designed to help the implant integrate seamlessly with the brain tissue. An important aspect of the research is the development of a new design for electrodes based on soft, gel-like materials. These materials are very similar to natural tissue, which can improve the compatibility and functionality of the implants. "With the biohybrid approach and the use of soft materials, we hope to achieve better biocompatibility of the implants and reduce the rejection reactions in the body," explains Binder. "We also expect that biohybrid electrodes will enable a higher resolution of the measured brain activity. In the long term, this could contribute to a better understanding of how the brain works."

About the CZS Nexus programme and the Carl Zeiss Foundation (CZS)

Binder receives funding as part of the CZS Nexus programme. With this programme, the Carl Zeiss Foundation offers young scientists the opportunity to establish a junior research group. The prerequisite is that the research project is at the interface between two or more disciplines in the fields of mathematics, computer science, natural sciences and technology.

Founded in 1889 by the physicist and mathematician Ernst Abbe, the Carl Zeiss Foundation is one of the oldest and largest private scientific foundations in Germany. It is the sole owner of Carl Zeiss AG and SCHOTT AG. Its projects are financed from the dividends paid by the two foundation companies. As a partner of excellent science, the foundation supports both basic research and application-oriented research and teaching in the STEM subjects (science, technology, engineering and mathematics).

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Further information

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