Innovations in intraoperative neuromonitoring: Green light for three new research projects by inomed Medizintechnik GmbH

With funding from the Federal Ministry of Education and Research (BMBF), inomed Medizintechnik GmbH has planned investments totalling €5.85 million in research into future technologies and the development of medical devices.

The funded projects are part of the measures "6G industry projects for research into holistic systems and sub-technologies for 6th generation mobile communications" in the research programme for communication systems "Sovereign. Digital. Networked." and "Lighthouse projects in quantum-based measurement technology for tackling societal challenges" as part of the programme "Quantum technologies – from fundamentals to market" and tax-based research funding.

6G mobile communications standard for better clinical collaboration
The motivation for the research project "Holistic development of high-performance 6G networking for distributed medical technology systems (6G Health)" arose in view of the major challenges posed by demographic change in the provision of medical care to the population. In the future, there will likely be fewer and fewer medical professionals available to care for individual patients. To counteract this development, an innovative 6G infrastructure for use in medical technology is to be developed.

As part of the "6G Health" research project, which kicked off on 8 February 2023 at Leipzig University Hospital, a total of 19 renowned partners will work together over a period of three years to develop and analyse 6G-based components for future medical technology applications. The solutions sought in the joint project will set the course for the holistic optimisation of healthcare along three main areas: patients, caregivers and processes. inomed Medizintechnik GmbH's focus is on integrating wireless interfaces into medical systems and networking systems from different manufacturers in the operating theatre. The integration of modern 6G technologies in medicine opens up a wide range of possibilities and can contribute to improving quality of life and reducing the burden on the healthcare sector.

Quantum sensor technology for better brain tumour surgery
The research project "DIAmond-based Quantum sensing for NeurOSurgery (DiaQNOS)" was developed against the backdrop of the particular challenges posed by brain tumour surgery. Until now, surgeons have had only limited access to precise intraoperative information. This is now set to change with the development of a new generation of intraoperative functional diagnostics and tumour detection using a novel quantum neuroanalyser (QNA).

The QNA is intended to provide a wealth of information on the differentiation of brain tumours, brain function and healthy tissue that goes far beyond the current state of the art, thereby improving the safety, precision and efficiency of neurosurgical cancer therapy. This will be achieved using highly sensitive diamond-based quantum sensors developed as part of the BrainQSens project.

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The opening event for the joint project "DiaQNOS" took place in December 2022 at the Helmholtz Institute Mainz. Eight different partners from research, medicine and industry will be working together on this project over a period of five years. In this context, inomed Medizintechnik GmbH is focusing on the further development of the current gold standard of electrophysiological tissue identification and the establishment of a system platform for the quantum-based measurement system. The technology developed in the research project can potentially be transferred to a wide range of other diseases and form the basis for quantum-sensory medical devices.

Further developments for intraoperative neuromonitoring
In addition, inomed Medizintechnik GmbH is working on an internal research project to develop innovative enhancements to its systems for intraoperative neuromonitoring. The project is funded by the BMBF as part of tax-based research funding in accordance with the Act on Tax Incentives for Research and Development (FZulG; BGBl I p. 2763), which came into force on 1 January 2020.

With the support of the BMBF, inomed Medizintechnik GmbH intends to continue to support patient safety during surgical procedures by using the latest technology in high-quality systems, thereby setting new standards. The successful implementation of the work is ensured by a qualified and highly motivated team. As a company awarded the TOP 100 Award 2022, inomed already employs 20% of its staff in research, development and product management. The projects will now create even more new jobs, allowing the inomed group of companies to continue its steady growth of recent years.

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