

## **iThera Medical leads €1.6m project to develop novel machine learning-assisted optoacoustic imaging of neuromuscular disease**

*Medical device company iThera Medical announces the kickoff of the technology innovation project SMART-3D funded by the Bavarian Research Foundation. Commenced on 01 May 2022, the project aims to develop an innovative new approach to monitor neuromuscular disease in pediatric patients through the company's proprietary optoacoustic imaging technology and next-generation 3D image reconstruction assisted by machine learning.*

MUNICH, Germany ([PRWEB](#)) May 17, 2022 -- Duchenne muscular dystrophy (DMD) is a rare genetic disease that presents as progressive muscle degeneration. Patients with DMD face an extremely hard battle; symptoms of the disease frequently become life-threatening, and no known cures exist. Promising yet extremely expensive novel pharmacological treatments currently undergoing clinical evaluation are set to slow down or even stop tissue degeneration, but disease progression and treatment must be closely monitored. The current gold standard in DMD monitoring is functional tests – i.e., physical challenges and tests presented to the patient. However, the drawbacks of these functional tests include their subjectivity, reliance on patient compliance, and inapplicability for very young patients and advanced cases. In comparison, new diagnostic approaches may offer a more quantitative, reliable, and universally applicable means of monitoring DMD status. Ultimately, this has the potential to significantly reduce health care costs by determining response to treatment early and decreasing the use of extremely expensive medication, lower the burden on patients, and in turn lead to better patient outcomes.

Multispectral optoacoustic tomography (MSOT) is an innovative, non-invasive diagnostic imaging method that provides information about tissue status based on the detection of disease biomarkers. The fundamental technology has already demonstrated its clinical value for the monitoring of DMD in a previous clinical pilot trial, where MSOT was able to directly detect and quantify collagen concentration in muscle tissue as a biomarker of DMD status in all patients, regardless of age or disease stage. By providing quantitative information and enabling more frequent monitoring, MSOT promises to enable clinicians to make better-informed and more timely adjustments to treatments.

SMART-3D aims to further advance the imaging capabilities of established MSOT technology to offer a revolutionary 3D imaging tool in the clinical assessment of muscle tissue. Led by SME iThera Medical, this interdisciplinary project is a close collaboration between researchers from the University Hospital Erlangen, the Ludwig-Maximilians University Munich, and the German Cancer Research Center (DKFZ).

The project has three major technology development points to advance muscle imaging with MSOT: (1) a prototype novel handheld 3D MSOT probe that is safe for use in a clinical environment, (2) novel “adhesive tattoos” to guide scanning and facilitate image stitching, and (3) next-generation machine learning-powered algorithms to efficiently stitch together individual 3D images to form larger volumes. The algorithms and detector will then be integrated into a new system prototype to provide near-real-time feedback to the clinician.

Stefan Morscher, project leader of SMART-3D and VP of Software Development at iThera Medical, relays his enthusiasm: “With first applications of our MSOT technology in its present 2D configuration evidencing clinical value in trials, extending the viability of the technology to the 3D space and otherwise neglected orphan diseases is an exciting next step. We are very happy to be part of this strong consortium and receive funding by

the Bavarian Research Foundation for this endeavor.”

Dr. med. Ferdinand Knieling, research group leader at the University Hospital Erlangen, adds: “This funding will ultimately increase the clinical value and utility of MSOT and bring it one step closer to our patients. My group looks forward to strengthening our existing collaborations with iThera Medical and LMU Munich and adding the excellence of Prof. Lena Maier-Hein's group at DKFZ.”

SMART-3D marks a key step towards establishing MSOT as a competitor in the broader medical imaging market, where the technology promises to deliver meaningful benefits to clinicians and their patients.

#### About iThera Medical

Since its incorporation in 2010, iThera Medical develops and markets optoacoustic imaging systems for preclinical and clinical research. More recently, the company has started translating its technology for routine diagnostic clinical use across various types of diseases, including cancer, inflammatory, fibrotic, and cardiovascular diseases. Optoacoustic imaging utilizes the photoacoustic effect – the conversion of light energy into acoustic signals – to visualize and quantify optical contrast in deep tissue, at high spatial and temporal resolution. For details see: <http://www.ithera-medical.com>

The SMART-3D project is funded through the Bavarian Research Foundation (Bayerische Forschungsstiftung, <https://forschungsstiftung.de/>). The material presented and views expressed are the responsibility of the author(s) only. The Bavarian Research Foundation takes no responsibility for any use made of the information set out.

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