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BioRegio STERN

Science2Start award ceremony at the BioRegio STERN summer reception in Reutlingen

Awards for brilliant, bold minds – new ideas for genome diagnostics and single-molecule sensing

(Stuttgart/Reutlingen) – The Science2Start award ceremony was held as part of the BioRegio STERN Management GmbH summer reception on 17 July 2025. In the Tübingen-Reutlingen Technology Park, scientists were honoured for ideas that a panel of experts judged to have special economic potential. First place was awarded to a team from Tübingen University Hospital and the University of Tübingen for "dxOmics" – an AI-driven software solution for genome diagnostics for cancer and genetic disorders. Second place went to a team from NMI Reutlingen for its "PoreForge" project, which involves developing technologies for single-molecule sensing using solid-state nanopores. The judging panel awarded two third-place prizes. One went to the University of Tübingen in recognition of "Helios2D" – a method for the mass spectrometric analysis of living cells without harming them. The other third prize was awarded to the Max Planck Institute for Intelligent Systems in Stuttgart for "EndoSurge" – an MRI-compatible catheter system with robotic control and artificial intelligence for surgical interventions to treat cardiac arrhythmias.

The BioRegio STERN Management GmbH summer reception was organised jointly with Verein zur Förderung der Biotechnologie und Medizintechnik e. V. and Technologiepark Tübingen-Reutlingen (TTR) GmbH. This major regional gathering for entrepreneurs, scientists, investors and politicians from the sector also hosted the 16th Science2Start award ceremony. These awards recognise life sciences ideas that have particular economic promise and have been developed by scientists and start-ups from the region. The prizes, worth a total of 5,500 euros, were again sponsored by Voelker & Partner Rechtsanwälte Steuerberater Wirtschaftsprüfer mbB, a firm of lawyers, tax consultants and auditors. Successful start-up founder Dr. Claus Kremoser gave the keynote speech. "As an experienced biotech entrepreneur, I am

delighted to be involved in the Science2Start award ceremony. It is so important that we encourage entrepreneurship. If we want to see growth, we need brilliant, bold minds who not only have great ideas, but are also courageous enough to put them to the test by setting up a company. I can only say that, of all the things I've done in my life, I have absolutely no regrets about becoming a biotech entrepreneur," he said.

The winners of the 2025 Science2Start competition

1st place: "dxOmics"
AI-driven software solutions for genome diagnostics for cancer and genetic disorders
Daniela Bezdan, Dr. Marc Sturm, Dr. Tobias Haack, Prof. Stephan Ossowski, Tübingen University Hospital and University of Tübingen

Cancer and rare genetic disorders affect many people. Today, modern genetic sequencing makes it possible to detect pathogenic changes in genomes at an early stage. However, analysing these complex data volumes is time-consuming and requires specialist expertise. This is where dxOmics comes in, plugging an important gap. Using AI-driven diagnostics, it speeds up the analysis of genetic data considerably, automates it and integrates it into everyday clinical practice. The underlying artificial intelligence was trained using more than 100,000 known pathogenic variants, tested by diagnosing 40,000 patients, and is already being used in a number of hospitals. dxOmics helps experts diagnose and select treatments for 300 types of cancer and 8,000 rare genetic disorders. The platform was developed at Tübingen University Hospital's Institute of Medical Genetics and Applied Genomics (IMGAG), and the spin-off company dxOmics GmbH was set up in late 2024. Combining powerful analysis tools, medical knowledge databases, artificial intelligence and cloud support, this platform provides an integrated system that reliably identifies disease-relevant genetic information and automatically converts it into specific treatment recommendations. The platform therefore makes a valuable contribution to the implementation of personalised medicine.

2nd place: "PoreForge"

Technologies for single-molecule sensing using solid-state nanopores

Dr. Peter D. Jones, Teresa Tang, Michael Mierzejewski, NMI Natural and Medical Sciences Institute in Reutlingen

A better understanding of the underlying molecular mechanisms of diseases can be achieved by analysing proteins. However, current methods have their limitations. They require central laboratories and expensive equipment, which restricts access and scalability. Dr. Peter Jones and his team are developing technologies for single-molecule sensing using solid-state nanopores. These nanometre-scale pores are produced in semiconductor materials and are considered promising sensors for the label-free analysis of individual proteins. The advantage is that they enable very compact systems through electrical readout and offer potential for high scalability thanks to semiconductor-based production. However, solid-state nanopore sensors are currently not available on the market in sufficient quantities. Researchers need thousands of chips with sufficient precision and the right materials. To plug this gap, PoreForge uses nanofabrication tools that enable rapid prototyping without expensive cleanroom facilities. Parallelisation is used to increase the nanopore density on each chip. The team has succeeded in integrating a high number of solid-state nanopores into a single microfluidic chip; this increases measurement throughput while improving signal quality.

3rd place: "Helios2D"

A method for the mass spectrometric analysis of living cells without harming them

Dr. Timm Schäfle, Institute of Organic Chemistry, University of Tübingen

To develop new active ingredients, Dr. Timm Schäfle developed an innovative analytical instrument for mass spectrometry based on cold helium plasma as part of his doctorate (Prof. Stephanie Grond's research group). The particular advantage of this technology is that living cells, such as bacteria, can be examined by mass spectrometry without being destroyed in the process. In contrast to conventional

processes, which map growth at a single point in time only, Helios2D enables the time-resolved analysis of a sample's metabolic profile over many days, so molecular changes during the various growth and stationary phases can be traced and studied in detail. This offers new insights into metabolic processes and the reactions of living cells to external influences such as active ingredients or environmental conditions. Besides bacteria, other types of cells, such as human cells – especially tumour cells – can now be studied over longer periods for the first time in order to identify new therapeutic targets. The University of Tübingen has already applied for a patent for this system, which involves a closed plasma ion source that is operated in an inert atmosphere and coupled to a mass spectrometer. Dr. Schäfle is now conducting further research under the University of Tübingen's Innovation Grant programme.

3rd place: "EndoSurge"
MRI-compatible catheter system with robotic control and artificial intelligence for surgical interventions to treat cardiac arrhythmias
Dr. Martin Phelan, Lisa Stuch, Siddhant Kadwe, Max Planck Institute for Intelligent Systems, Stuttgart

In Germany alone, approximately 100,000 catheter ablations are performed each year to treat abnormal heart rhythms (arrhythmias). The innovation designed by Dr. Martin Phelan and his team is based on the development of a fully MRI-compatible catheter system that carries out surgical interventions to treat arrhythmias with the help of robotic control and artificial intelligence (AI). Consisting of a robotically controlled handset and a teleoperation module, the MERLIN system uses the strong static magnetic field of a clinical MRI system – not for precise real-time imaging, but instead to actively control the catheter tip. A unique feature of this technology is its remote control architecture. Algorithms can be integrated that learn continuously from the real-time MRI image data and force measurement sensor data. This makes it possible to determine optimum control profiles for different anatomical situations. Thanks to the teleoperation interface, highly specialist expertise is available anywhere – for example, in regions with inadequate medical care.

About BioRegio STERN Management GmbH:
BioRegio STERN Management GmbH promotes economic development in the life sciences industry, helping to strengthen the region as a business location by supporting innovations and start-up companies in the public interest. It is the main point of contact for company founders and entrepreneurs in the Stuttgart and Neckar-Alb regions, including the cities of Tübingen and Reutlingen.
The STERN BioRegion is one of the largest and most successful bioregions in Germany. Its unique selling points include a mix of biotech and medtech companies that is outstanding in Germany and regional clusters in the fields of automation technology and mechanical and plant engineering.

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