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# Better and Faster Diagnosis of Diseases

## Microsystems engineer Can Dincer wins the second prize at Gips-Schüle young scientist competition

The microsystems engineer Dr. **Can Dincer** from University of Freiburg has been awarded by the second place in Gips-Schüle Young Scientist Award for his dissertation on the optimization of biosensor systems for diagnosing diseases. The Gips-Schüle Foundation held the competition for outstanding dissertations in the so-called STEM fields (science, technology, engineering, and mathematics) for the first time this year. First prize is rewarded with 10,000 euros, second prize 5,000 euros, and third prize 2,500 euros.

Diseases need to be diagnosed precisely at an early stage in order to ensure successful treatment of the patient. In many cases, however, the clinical findings are based on the analysis of a single biomarker that delivers information on the presence of a disease. This is usually not sufficient to provide an overall picture of a disease and to ensure appropriate treatment. In addition, for clinical diagnostics it is desirable to analyze several different substances – such as biomarkers, hormones, and drugs – simultaneously from a single sample. Dincer's dissertation investigates possibilities for developing smaller biosensor systems with enhanced sensitivity. On the basis of simulations, design studies, and experiments, he succeeded in developing novel design rules for biosensors. This simple concept enables the cost-efficient and compact development of a biosensor platform for the rapid, sensitive, and simultaneous analysis of up to eight different substances. The system was applied successfully in studies of various

antibiotics in human blood plasma. The entire analysis, from the collection of the sample to the result, was completed in just ten minutes.

The successful development of this biosensor platform has also paved the way for further projects and partnerships, including two projects funded by the German Research Foundation on the simultaneous analysis of microRNAs for point-of-care testing of various tumors. microRNAs are tiny nucleic acids that play an important role in gene regulation. The dissertation was supervised by Prof. Dr. **Gerald Urban** from the Department of Microsystems Engineering and Prof. Dr. **Wilfried Weber** from BIOSS Centre for Biological Signalling Studies of the University of Freiburg.

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