

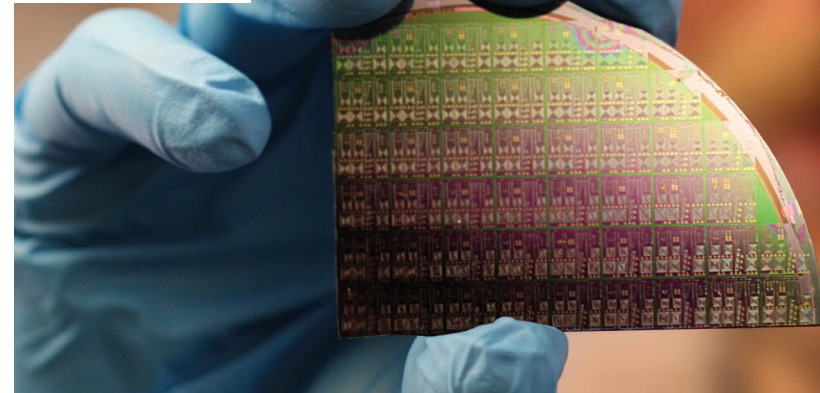


## Micro and nanosystems at KTH Royal Institute of Technology

KTH Royal Institute of Technology is Sweden's largest technical university, with 12 000 undergraduate students, over 2 000 research students, and 3 700 employees. KTH education and research covers a broad spectrum – from natural sciences to all branches of engineering.

The department of Micro and Nanosystems (MST) employs 43 senior and graduate researchers with a research focus on Micro- and Nanoelectromechanical Systems (MEMS/NEMS). MST has five general fields of research: optical systems, telecom and remote-sensing THz technology, bio-micro-nanofluidics, 3D-MEMS integration and medical technology. Professor Frank Niklaus leads the work on Graphene MEMS, based on wafer-scale graphene-transfer technology. Assistant professor Kristinn B. Gylfason leads the work on waveguide integrated graphene-based photodetectors.

More information can be found at [www.kth.se/mst](http://www.kth.se/mst).



## Instant identification of disease

Blood samples contain vital information about a person's health. Conventional blood tests require laboratory equipment, which is not available in developing countries without specialized healthcare systems. In case of an epidemic outbreak, this lack results in a critical delay between sample collection and test result. There is a critical need for fast, low-cost biosensing in low-volume blood samples that gives immediate results.

Our sensing platform is based on silicon photonics with graphene photodetectors which identify the “molecular fingerprint” in the infrared spectrum of disease indicators in a single drop of blood from a prick in the fingertip.

Graphene provides the ability of low-cost, high-volume integration with established silicon photonics platforms - a unique combination competing technologies lack. The direct electrical readout enables the exchange of information over existing telecommunication infrastructure and supports the early identification of epidemic outbreaks and the coordination of humanitarian aid.

### Contact

**Arne Quellmalz,**  
Ph.D. student, KTH Royal Institute of Technology, [arne.quellmalz@eecs.kth.se](mailto:arne.quellmalz@eecs.kth.se)

**Kristinn B. Gylfason,**  
Asst. Prof, KTH Royal Institute of Technology, [kristinn.gylfason@eecs.kth.se](mailto:kristinn.gylfason@eecs.kth.se)

**Frank Niklaus**  
Prof, KTH Royal Institute of Technology, [frank.niklaus@eecs.kth.se](mailto:frank.niklaus@eecs.kth.se)

**Mikael Östling**  
Prof. and Deputy President, KTH Royal Institute of Technology, [mostling@kth.se](mailto:mostling@kth.se)

