

# Graphene field-effect transistors

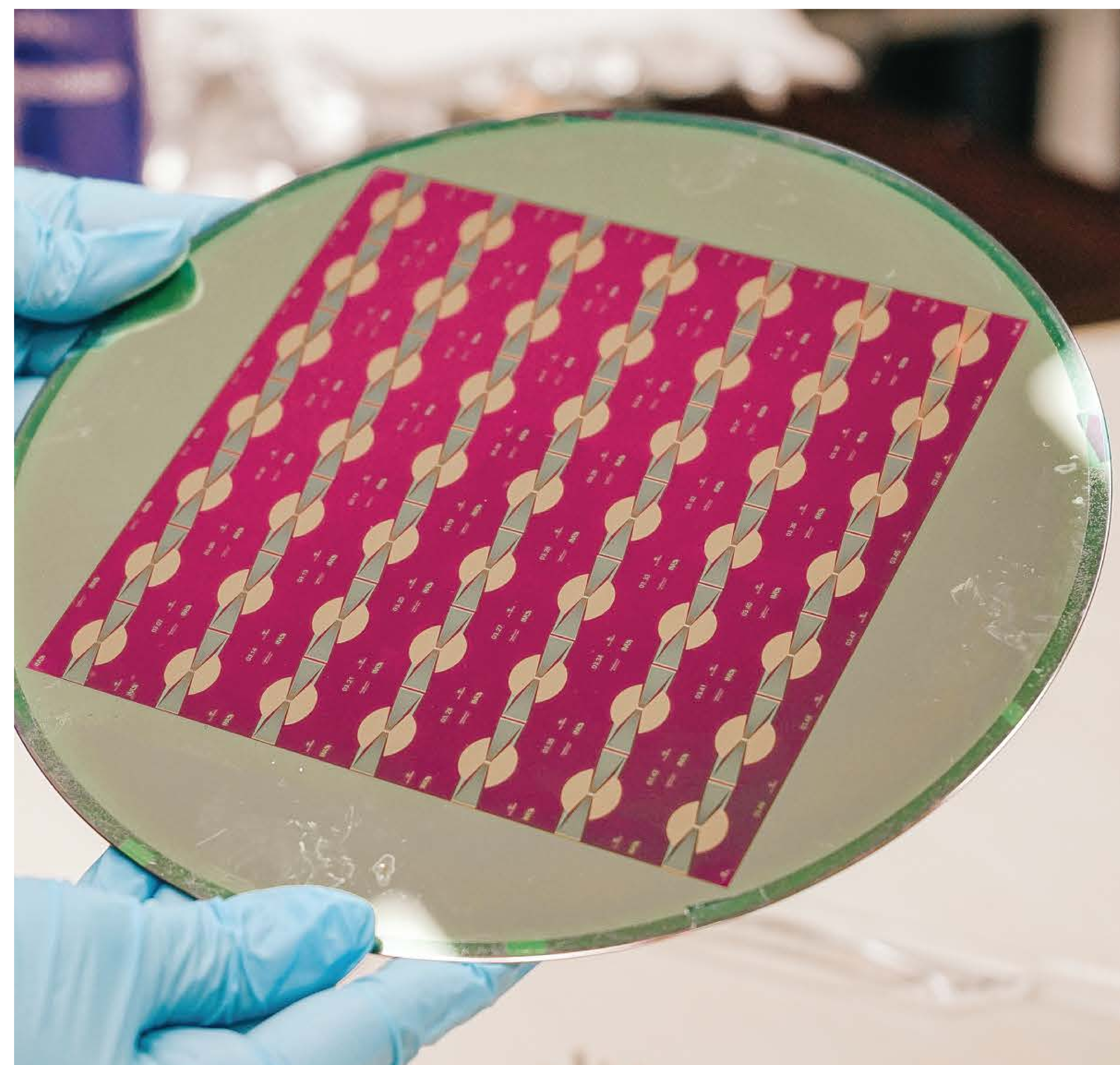
INL develops graphene FETs as a platform for a range of health applications. We are capable of producing these biosensors at wafer-scale in a process that can be scaled up.

Field-effect transistors (FETs) made of bi-dimensional materials - and in particular graphene, can operate as biosensors to detect different targets such as DNA, proteins and other small molecules, within biological fluids or artificial buffers.

The sensor readout is solely electronic and does not require any fluorescent label. When these charged biomolecules are present within the sample, there is an alteration in the electrostatic field at the transistor's surface, and the transistor is able to measure the current change. Remarkably, the electronic readout is simple and relies only on DC signals.

Due to the high sensitivity of graphene, these FETs can detect very small amounts of biomolecules, such that transistors can be used for early diagnosis of a variety of conditions, such as infectious diseases and certain types of cancer. Field-effect transistors can also distinguish single differences in DNA sequences (single nucleotide polymorphisms or SNPs) and therefore can detect individual mutations in individuals.

INL develops graphene FETs as a platform for a range of health applications. We are capable of producing these biosensors at wafer-scale in a process that can be scaled up to industrial volumes.

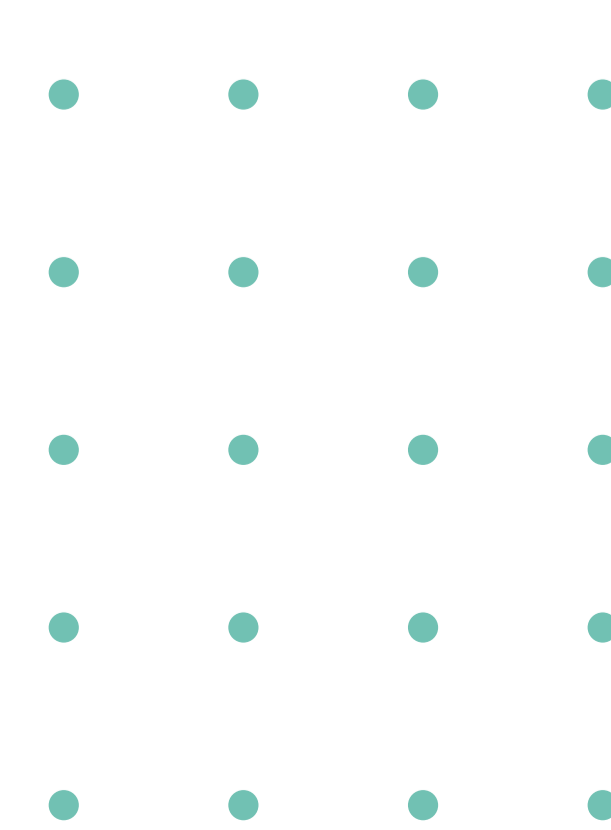


## + Suggested applications

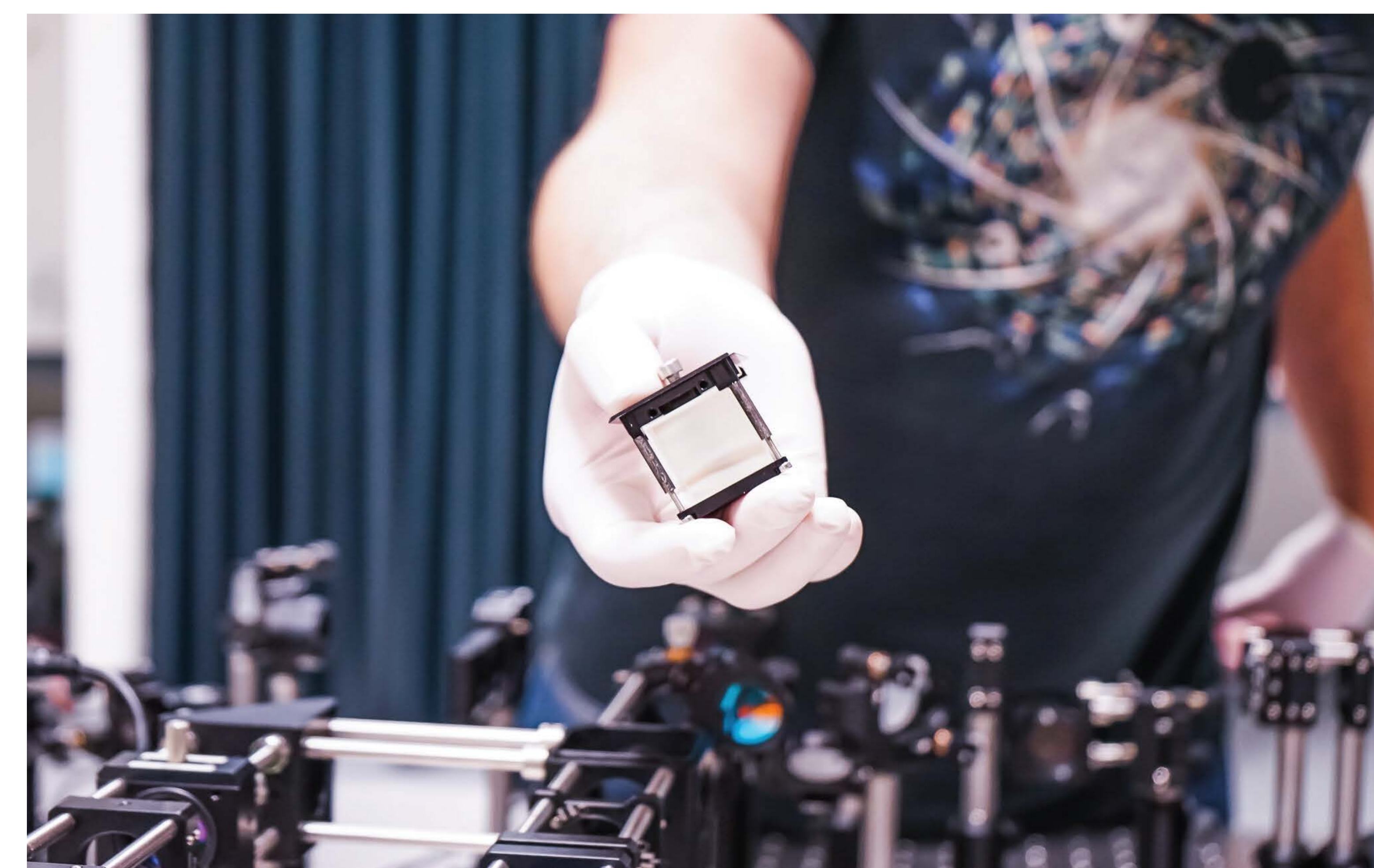
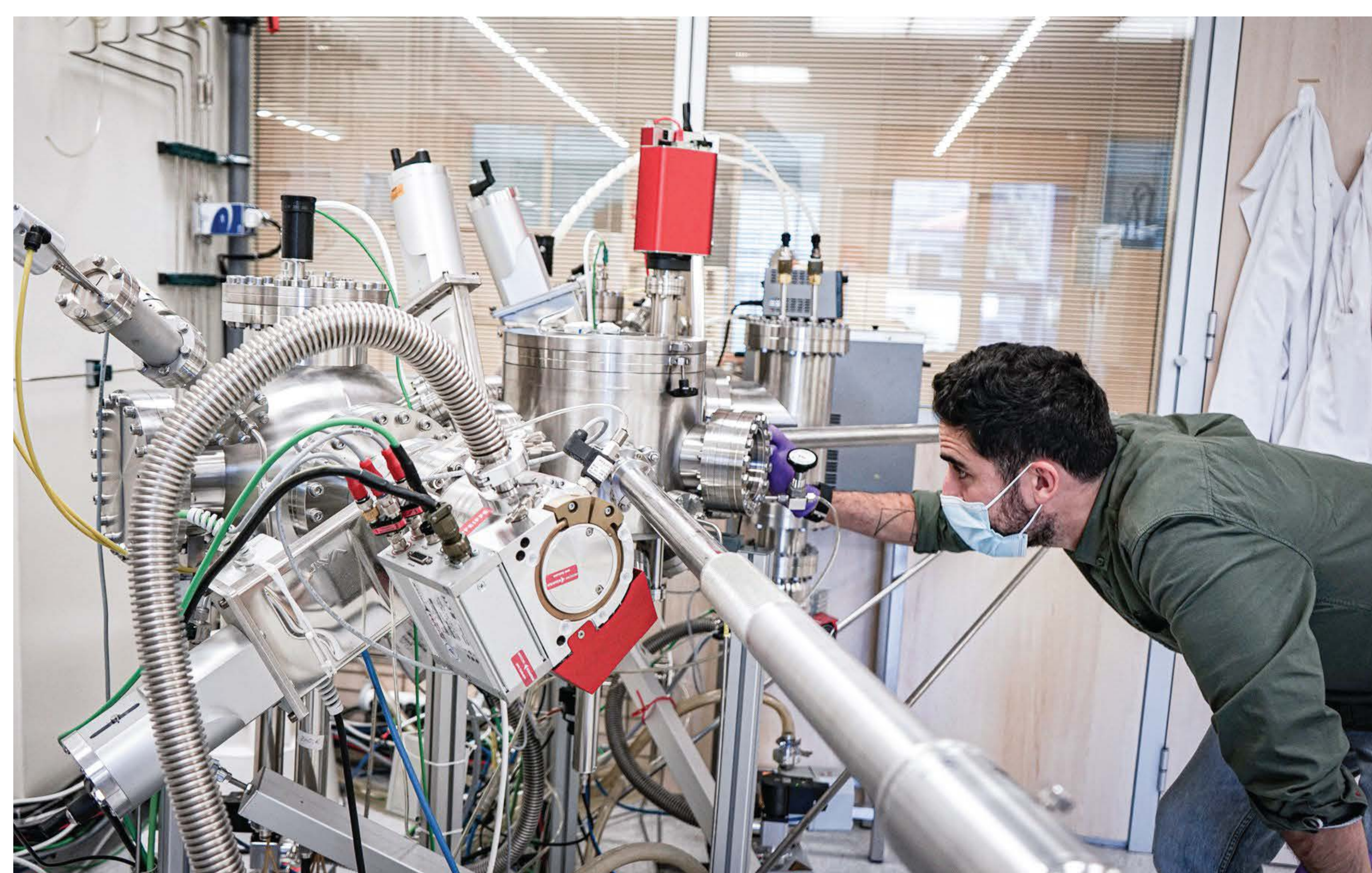
Diagnosis of infectious diseases  
 Diagnosis of genetic conditions  
 Personalised medicine

## + Features

Low level of detection (attomolar range)  
 No or minimal sample preparation (dilution in buffer)  
 Label-free, fully electronic reading  
 Multiplexed detection







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