Institute of Molecular Biology

# IMB TechTalk

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## “Using Single Molecule Arrays (Simoa): Technology and Applications”

## 24 November 2015, 11:00 (*s.t.*)

**Venue:** IMB Seminar Room 2nd floor

Institute of Molecular Biology (IMB)

Johannes Gutenberg University Campus Mainz

All are welcome to attend

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## Abstract:

### Using Single Molecule Arrays (Simoa): Technology and Applications

Quanterix Corporation has developed a digital platform to detect individual protein molecules in single molecule arrays. The Simoa technology first isolates individual immunocomplexes on paramagnetic beads using standard ELISA reagents. The main difference between Simoa and conventional immunoassays lies in the ability to trap single molecules in femtoliter-sized wells, allowing for a "digital" readout of each individual bead to determine if it is bound to the target analyte. Simoa assays may be run in singleplex or multiplex modes. Simoa assays are performed on the Simoa HD-1 fully automated system using a microfluidic disc containing 24 arrays, each with 216,000 individual wells.

In contrast to conventional ELISA assay reactions, the signal generation volume in a Simoa assay is 2 billion times smaller, allowing for a single target molecule in a sealed microwell to quickly generate enough fluorophores to be measured using conventional fluorescence imaging—as opposed to millions of molecules needed for accurate measurement. By measuring individual proteins at concentrations 1,000 times lower than the best immunoassays available today, researchers are able to detect, measure and validate new and existing biomarkers at concentrations previously unattainable and much earlier in the disease progression.

Quanterix is currently focused on Simoa assays for critical disease areas including oncology, neurology, infectious disease and immunology. Examples from these key areas will be reviewed during the seminar.