REAL SAMPLES, REAL DATA:
FULL KINETIC CHARACTERIZATION OF ANTIBODIES IN BIOFLUIDS

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A NEW LEVEL OF PERFORMANCE AND FLEXIBILITY IN DRUG DISCOVERY

By bringing together modern label-free technology, application development know-how and sophisticated software, Creoptix offers a unique optical biosensor tool for binding kinetics. Engineered around our proprietary Grating-Coupled Interferometry (GCI)[1] technology, the Creoptix WAVEsystem delivers high-quality kinetic data across a broader range of samples than traditional SPR equipment.

Assess drug performance in undiluted biofluids for reliable kinetic profiling in conditions closer to real life

Quantify binding affinities (K_d) from low pM to high µM with confident kinetic analysis

Identify the most effective antibody pairs and the optimal assay configuration

GRATING-COUPLED INTERFEROMETRY (GCI)

More information about GCI

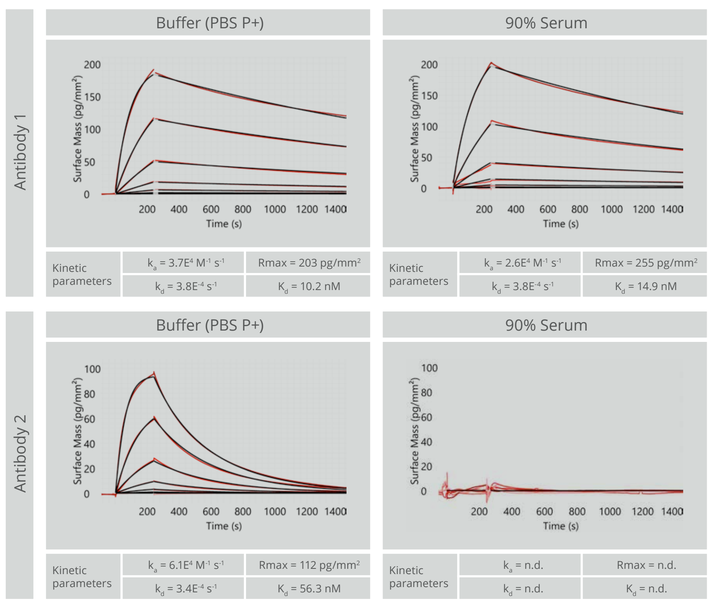
GCI is a surface-based, label-free biosensing technique. When target molecules (e.g. proteins) are attached to the sensor surface, binding of analytes leads to an increase in mass and hence to a change in the refractive index within the evanescent field near the surface. In GCI, refractive index changes on a sensor surface are measured as time-dependent phase-shift signals. The long light-to-sample interaction length of the waveguide provides intrinsically high signal-to-noise levels for improved sensitivity.

The Creoptix® WAVEsystem combines GCI with innovative no-clog microfluidics, allowing the study of interactions even between very small ligands and large complexes. The system uses a robust microfluidic sensor, the WAVEchip®, where (membrane) proteins,[2] antibodies, VLPs, peptides or other molecules can be immobilized using various chemistries.

ANTIBODY PROFILING IN BIOFLUIDS

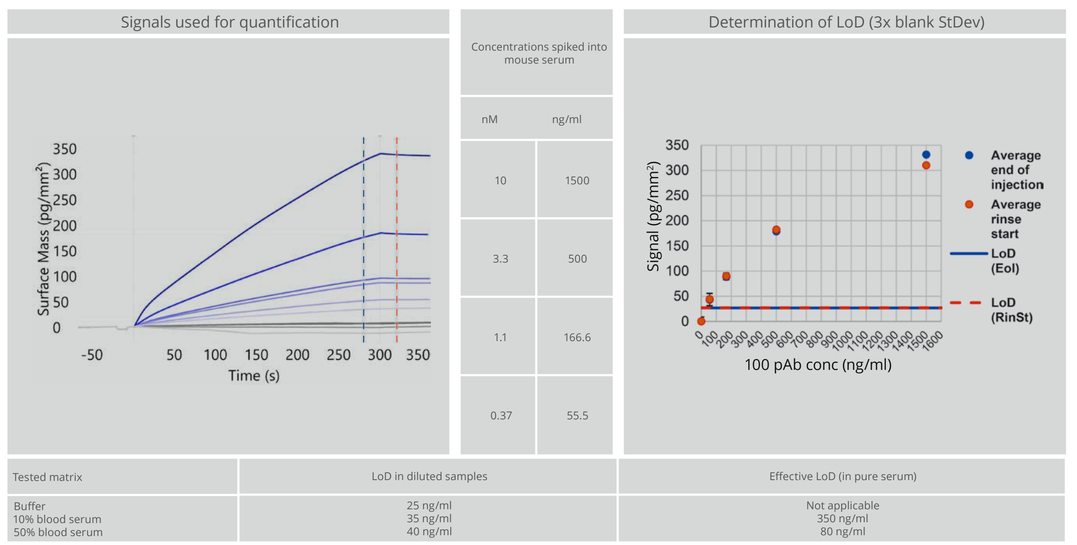
The robust sensor and microfluidics of the WAVEsystem allows the kinetic characterization of molecular interations in almost pure serum or plasma. Binding proteins developed for diagnostic applications can therefore be directly profiled in great detail within the respective crude matrix.

Here, a full kinetic interaction analysis acquired in the course of an antibody profiling study is shown. Two different antibodies were immobilized on a 4PCP WAVEchip via amine coupling. The respective antigen was injected in either buffer (PBS P+) or 90% human serum in a dilution series of eight (8) concentrations ranging from 137 pM to 300 nM at 95 µl/min for 240s followed by 1200s dissociation. Raw data were double referenced and globally fit with a 1:1 binding model. For antibody 2 no binding was observed in serum.



ANTI-DRUG ANTIBODY QUANTIFICATION FROM BLOOD SERUM

Here we show that the Creoptix® WAVEsystem can help you gain an accurate indication of antibody concentration and identify early immune response by detecting very low levels of antibody (80ng/ml in serum) directly from blood serum.

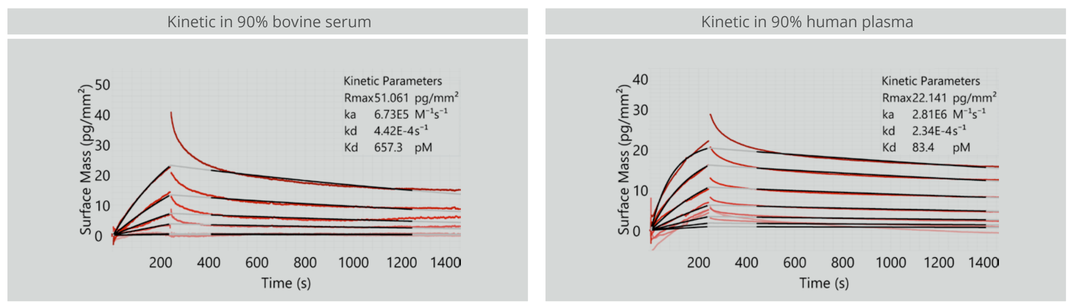


As shown here, in combination with robust microfluidics GCI allows for the detection of significantly lower antibody titers (lower limit of detection, LoD) by enabling direct quantification in almost pure blood serum.

FULL KINETICS IN SERUM AND PLASMA

Avoid the risk of antibody-based assay development failure with our no-clog microfluidics technology by profiling the performance and stability of individual antibodies in a range of physiologically relevant media, including biofluids such as serum and plasma.

Monoclonal antibodies (mAbs) were immobilized via amine coupling on a 4PCH chip. The protein analyte was spiked in 90% serum or 90% plasma as indicated, and injected in six concentrations (4 nM - 31 pM). Raw data were double referenced and globally fit with a 1:1 binding model.



GCI IS FEATURED IN

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2 Hohmann et al., "The SERK3 elongated allele defines a role for BIR ectodomains in brassinosteroid signalling.", Nature Plants, 4:345–351 (2018)
3 Brough et al., "Application of Off-Rate Screening in the Identification of Novel Pan-Isoform Inhibitors of Pyruvate Dehydrogenase Kinase", J. Med. Chem., 60 (6), pp 2271-2286 (2017)
4 Brough et al., "4,5-Diarylisoxazole Hsp90 Chaperone Inhibitors: Potential Therapeutic Agents for the Treatment of Cancer", J. Med. Chem., 51 (2), pp 196–218 (2008)

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