



Applications of focal molography in diagnostics, bioprocessing and drug discovery

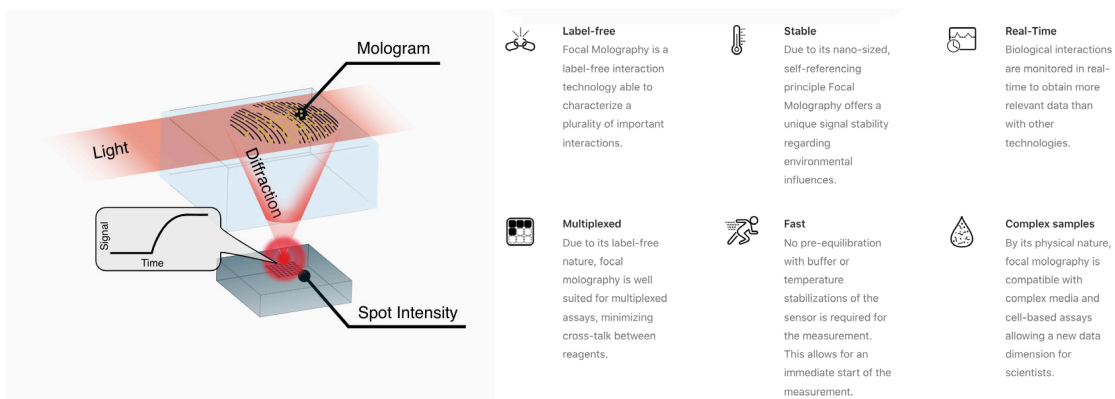
A.Frutiger¹, V.Gatterdam¹, A.M.Reichmuth², Y.Blickenstorfer², Christof Fattinger³, Janos Vörös²

¹Lino Biotech AG, Gloriosastrasse 35, 8092 Zürich, Switzerland

²Laboratory of Biosensors and Bioelectronics, Institute of Biomedical Engineering, University and ETH Zürich, 8092 Zürich, Switzerland

³Roche Pharma Research and Early Development, Roche Innovation Center Basel, 4070 Basel, Switzerland

Focal molography is a new label-free detection method, which allows the real-time investigation of complex molecular interactions in the presence of a complex biological environment without any stabilization or equilibration¹⁻³. Thereby, opening up new perspectives and possibilities in drug discovery, bioprocessing or diagnostics and related disciplines. In particular, we have shown an interesting approach to diagnostics based on real-time immunosignaturing⁴. This approach utilizes an array of molographic sensors to discriminate between different health conditions in a real-time direct binding assay format. We demonstrated the proof of principle with plasma profiling of different hemagglutinin-like peptides to discriminate different blood donors. In addition, we demonstrate other non-diagnostic applications of focal molography including the determination of binding parameters in complex samples³, the characterization of membrane proteins in living cells⁵ as well as the real-time observation of cytosolic proteins in living cells⁶. As the figure summarizes the features of focal molography make it an ideal technology for future miniaturized point of care devices.



The principle of focal molography and features of the technology : Molecules bind to a special pattern that has the shape of a diffractive lens. The molecules that bind to this pattern diffract light into a focal spot that can be monitored and yields a real-time binding curve. Any molecules that bind to the surface randomly are invisible. The same holds true for temperature drift and buffer changes that occur on longer length scales. Focal molography is therefore the only label-free biosensor that can measure directly in complex samples, does not require stabilization, can be multiplexed and miniaturized. These features make it an ideal technology platform for future POC diagnostic devices.

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