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Centre de recherche en biomédecine de Strasbourg
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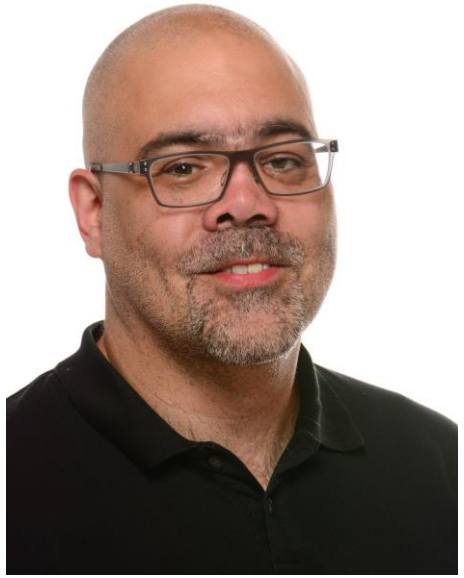
Monday, 17 January 2022, 2pm at the CRBS

CRBS Auditorium
1 Rue Eugène Boeckel
67000 Strasbourg

MAX PLANCK GESELLSCHAFT



Prof. Dr. Jochen Guck

Jochen Guck

Director of the Max Planck Institute for the Science of Light

"Physical phenotyping at rates of 1,000 cells/sec"

While most current biological research focuses on molecular, biochemical aspects of cell processes, we are interested in the physical properties of cells, their importance for biological function, and ultimately transfer of insights to medical application. One major roadblock has been a paucity of appropriate tools for the convenient quantification of such properties. Recently, we have introduced real-time deformability cytometry (RT-DC) to address this need. RT-DC permits the continuous physical single-cell characterization of large populations (> 100.000 cells) with analysis rates of 1,000 cells/s — approaching that of conventional fluorescence-based flow cytometers. Using RT-DC we can sensitively detect physiological and pathological changes in cell function by image-based parameters such as size, shape, deformability, and any other information contained in an image. For example, we have recently demonstrated its utility for detecting blood mechanical changes in the context of Covid19. Combined with machine learning, conventional fluorescence detection and sorting, this technology constitutes a novel discovery machine specifically well suited to identify and characterize cell populations and states invisible to marker-based techniques. Physical phenotyping adds a new functional, marker-free and unbiased dimension to flow cytometry with diverse applications in biology, biotechnology and medicine.