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Metrology for Measurement and Monitoring of Immunity

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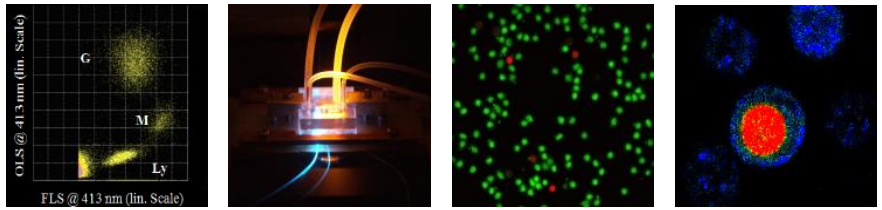
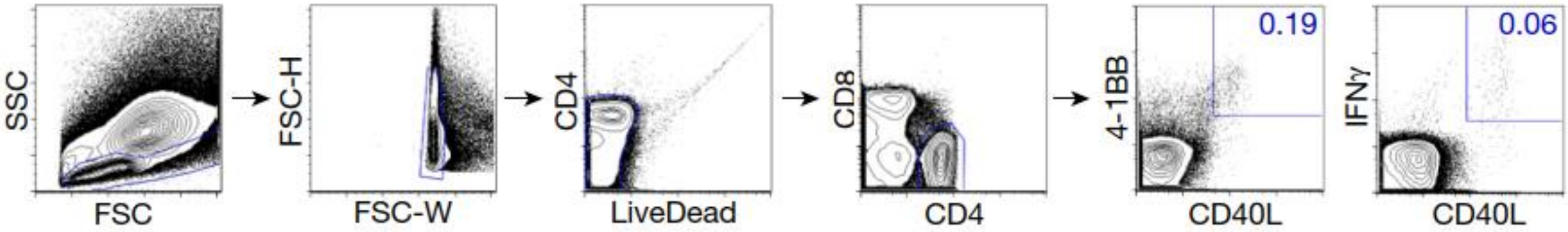


Cellular Phenotyping and Immunity

- Sensitive multiplex panel for target cells needed
  - ❖ Quantification of low expression levels (e.g. T cell activation)
  - ❖ Multi parameter analysis
- Complex Assay using in vitro stimulation necessary

Needs:

- Protocol for assay development and validation, incl. standardization, EQA
  - Antibody selection/validation
  - Guide to select fluorochromes and instrument settings
  - Absolute quantification



Braun *et al.* 2020 Nature 10.1038/s41586-020-2598-9

Measuring Antibody Binding Capacity

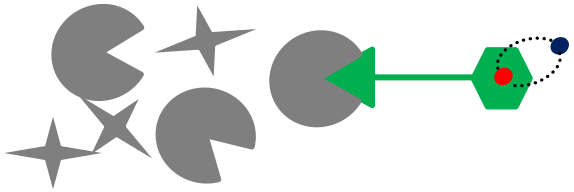
- Multicolor detection and characterisation of specific cell states and/or responses

- **A**ntibody **B**inding **C**apacity, protein expression level
  - quantification and localisation of antigenes, e.g.
    - **HIV:** changes in CD38 expression, indicator for progression
    - **CLL:** CD3/CD4 on T-cells, CD20/CD22 on B-cells
  - Also relevant for bead assays etc.

- Correlation with ID-MS → traceability

Calibration Free Antibody Quantification

- **absolute quantification by Xe NMR spectroscopy**



  - xenon exchange with biosensor detected by NMR

  - hyperpolarization boosts detection sensitivity → NMR competitive to optical assay
  - instrumentation independent results → high comparability
  - no biological reference material needed

- **applications**
  - orthogonal quantitative approach
  - traceability due to traceable xenon solubility
  - quantification when RM not available/quantification of RM