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“Living droplets: Biology on a
drastically miniaturized scale”

16 April 2013, 11:00 (*s.t.*)

Venue: 2nd Floor Seminar Room
Institute of Molecular Biology (IMB)
Johannes Gutenberg University Campus Mainz

All are welcome to attend

Abstract:

Living droplets: Biology on a drastically miniaturized scale

Droplet-based microfluidic systems allow the analysis and manipulation of cells at very high throughput (up to 10^6 samples per hour), optionally even on the single-cell level. In these systems aqueous droplets within an immiscible oil phase serve as miniaturised reaction vessels. The small assay volumes (pico- to nanoliters) facilitate the obtainment of high concentrations of nucleic acids (mRNA, DNA) or proteins (e.g. secreted antibodies) from individually encapsulated cells, paving the way for single cell assays. As a first application we demonstrate functional single-cell hybridoma screening: Individual cells are encapsulated into droplets and assayed directly for the release of antibodies inhibiting drug targets. The technology facilitates screening more than 20 cells per second and is even applicable to primary plasma cells, as it does not rely on cell immortalization. Further applications of the technology include vaccine development and genotype/phenotype studies of human cancer cells.