

Towards cell based high throughput screenings in 3D environment using HydrogelMicroarray

Position:

PhD student

Field of research: Biochemistry, Cell biology, high throughput screenings of live cells

Starting date: as soon as possible

Duration of the project: 3 years

Contact person:

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Description of the project:

HydrogelMicroarray is a novel platform for screening of live cells in 3D environment developed in the group of Dr. Pavel Levkin „Functional and stimuli-responsive polymer surfaces“ (<http://www.levkingroup.com>). The array consists of a panel of hydrophilic spots of different sizes divided by hydrophobic borders. Due to the high wettability contrast between superhydrophilic and superhydrophobic surfaces cell suspension applied onto such surface will spontaneously form an array of separated droplets containing live cells (*Adv. Mat.*, 2013, 25, 1234-1247). Preprinting of curing agent prior to spreading of cells will allow immediate formation of array consisting of separated hydrogel micro pads with live cells trapped inside. HydrogelMicroarray serves as a perfect 3D screening platform since cells can be exposed to different substances (plasmid DNA, siRNA, drugs) being in completely isolated hydrogel micro pads. Culturing cells in 3D format was long accepted to more closely mimic the *in vivo* environment. High throughput screening of cells in 3D can be therefore a better screening model where change of cell phenotype will more accurately represent cell behavior *in vivo*. The initial goal of this project is to optimize the fabrication of HydrogelMicroarray as well as culturing conditions for various cell lines. Different low to high throughput cell based screenings will be performed using HydrogelMicroarray. The successful candidate should hold a major in biology or biochemistry and have a basic experience in working with animal cell culture. Experience in working with 3D systems is an advantage. Excellent oral and written skills in English are essential. If you have any questions regarding the project please contact Dr. Pavel Levkin (pavel.levkin@kit.edu)