

Automated microinjection of cell-polymer suspensions in 3D ECM scaffolds for high-throughput quantitative cancer invasion screens

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Cell spheroids (CS) embedded in 3D extracellular matrix (ECM) serve as in vitro mimics for multicellular structures in vivo. We describe a method where cell-polymer suspensions are microinjected as droplets into collagen gels and CS formation occurs within hours for a broad range of cell types. We have automated this method to produce CS arrays in fixed patterns with defined x-y-z spatial coordinates in 96 well plates and applied automated imaging and image analysis algorithms. Low intra- and inter-well variation of initial CS size and CS expansion indicates excellent reproducibility. Distinct cell migration patterns can be visualized and manipulated.

Biography

Jan de Sonnevile done Bachelors in Electrical Engineering, Delft University of Technology (TUDelft), Master in NanoScience (Applied Physics), given as joint program by TUDelft and Leiden University, the Netherlands (2006). PhD on the development of four novel research methods for Cell Biology, thesis title: "Reinventing microinjection, new microfluidic methods for cell biology" (2011). Founded Life Science Methods BV to sell Automated Microinjection Systems for high throughput screening using cell spheroids and zebrafish embryos (2011).

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