

Microfluidic platform for high-throughput drug screening on patient-derived organoids 3D cultures

Gabriele DUBINI - *Polytechnic University of Milan*

Organoids are in vitro-cultured self-assembling three-dimensional (3D) structures derived from stem cells able to recapitulate the structure and functions of the organs of origin. They represent useful in vitro models for studying development processes, regenerative medicine, pharmacological research, and disease modelling. Patient-derived organoids (PDOs) represent an easy-to-use and more realistic alternative to 2D and xenograft models and hold promise for developing personalized medicine.

This talk presents a platform to culture organoids for drug screening purposes. This platform is designed to host and recover 288 independent Matrigel® drops, containing patient-derived organoids, in a 384 multiwell plate format.

Validation of the platform has been performed by exploiting a biobank of genomically and clinically annotated organoids, generated from surgical resections of colon cancer metastasized to the liver. Extensive testing has confirmed organoid growth and proliferation in the platform with respect to their counterpart cultured in standard conditions. The platform allows reducing the reagent amounts and the experimental time to obtain clinically relevant information on drug sensitivity.

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