HIGH-THROUGHPUT LIGHT SHEET-BASED FLUORESCENCE MICROSCOPY (HT-LSFM) FOR THE PHENOTYPING OF 3D HUMAN PANCREATIC ORGANOIDS

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Adult stem cell organoid technology is revolutionizing regenerative medicine and the *in vitro* modeling of diseases [1]. Light sheet fluorescence microscopy (LSFM) is the key imaging technology for the characterization and quality control of the large and highly scattering organoids. The next-generation LSFM High-Throughput Light Sheet Microscope (HT-LSFM) will allow us to perform quantitative analysis on hundreds of living organoids in their native three-dimensional environment. No special mounting techniques (such as embedding in agarose) are required, greatly simplifying the handling. The organoids are cultured in the HT-LSFM multi-well plates compatible with standard manual and automated laboratory procedures. I show the design of the HT-LSFM as well as the features of the HT-LSFM multi-well plates. Finally, I illustrate the application of the HT-LSFM for the characterization and quality control of pancreatic and liver organoids in the groundbreaking cell-therapy project LSFM4LIFE (www.lsfm4life.eu) for the therapy of type 1 diabetes.

References

[1] Koo BK, Huch, M. Organoids:a new in vitro model system for biomedical science and disease modelling and promising source for cell-based transplantation. Dev Biol. 2016 doi: 10.1016/j.ydbio.2016.10.017