Automated High-Throughput Imaging and Analysis of Patient-Derived Pancreatic Cancer Organoids Using Gri3D® microwell plates and SYNENTEC's automation system

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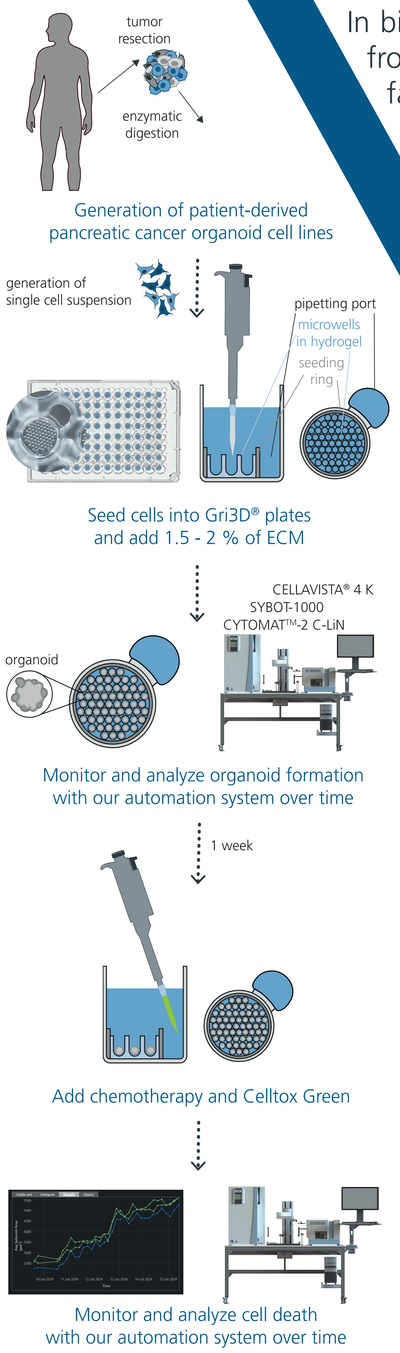
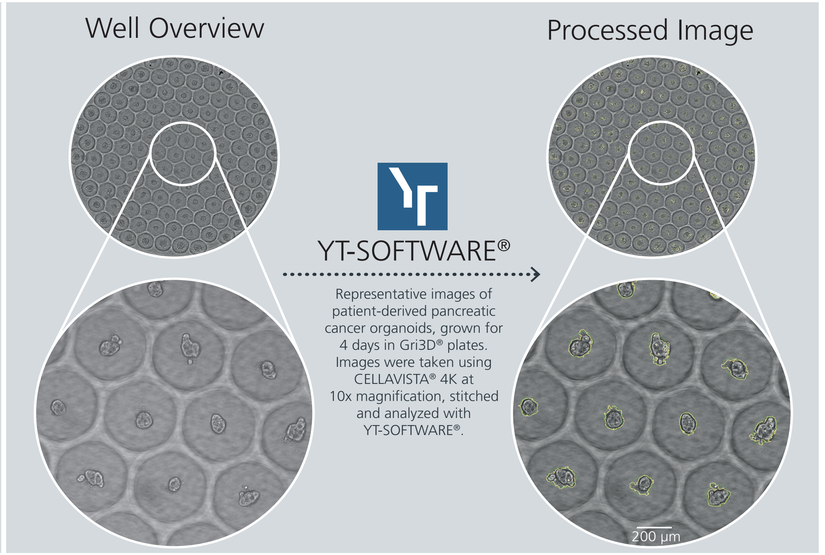
Method



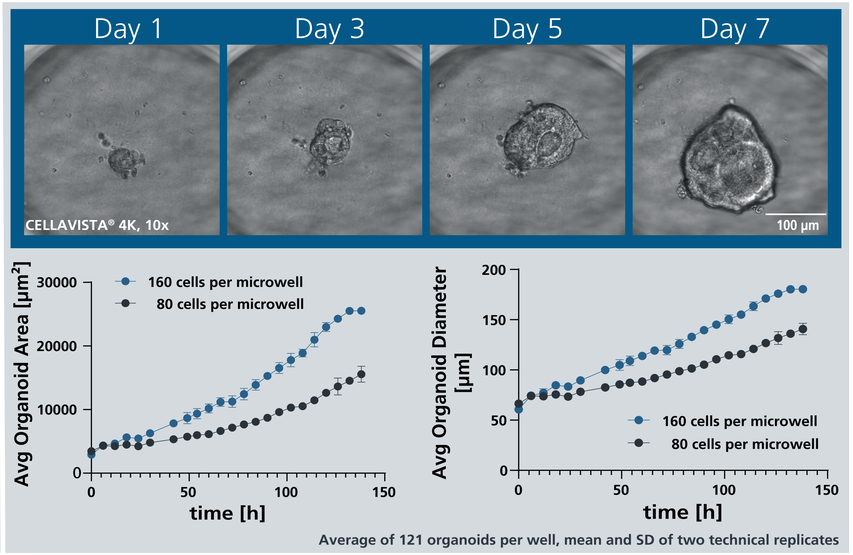
Introduction

In biomedical research, better disease models are urgently needed. One relevant alternative to traditional 2D cell cultures are organoids – 3D structures from stem cells or primary tissue recapitulating key features of organ physiology. However, classical organoid culture in solid extracellular matrix (ECM) faces challenges like size variability, random positioning, multiple focal planes, extensive user training, and low throughput, limiting scalability in high-throughput screening. Alternatively, organoids can grow in suspension with 1.5 - 2 % ECM in Gri3D® hydrogel microwell plates (SUN bioscience), which are designed to enable screening of organoids in automated settings. This study evaluated organoid cell growth and drug responses by automated imaging combining Gri3D® and our automation system (SYBOT-1000, CYTOMAT™ 2 C-LiN, CELLAVISTA® 4K).

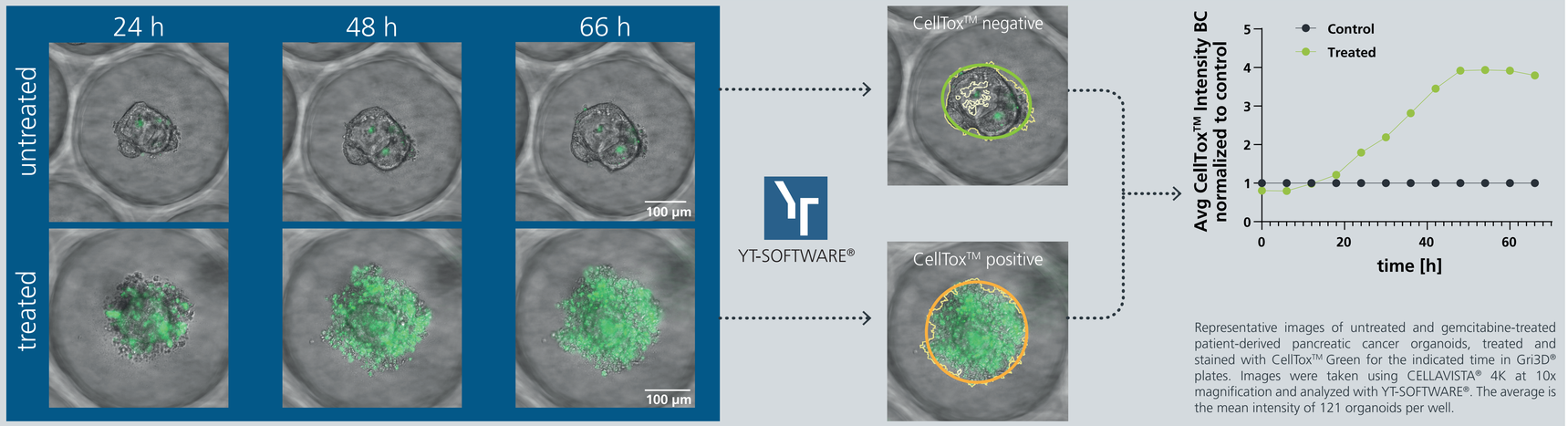
Image Analysis



Growth Monitoring



Cytotoxicity Assay



Conclusion

- Reduce costs and improve handling and reproducibility by using little ECM
- Monitor and analyze organoid formation and cytotoxicity over time
- Image and analyze >100 organoids in a well within one focal plane

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