

Label-Free, Real-Time Live Cell Assays for 3D Organoids Embedded in Matrigel®

K. Barnes^{1*}, M. Oliver, T. Jackson and T. Dale

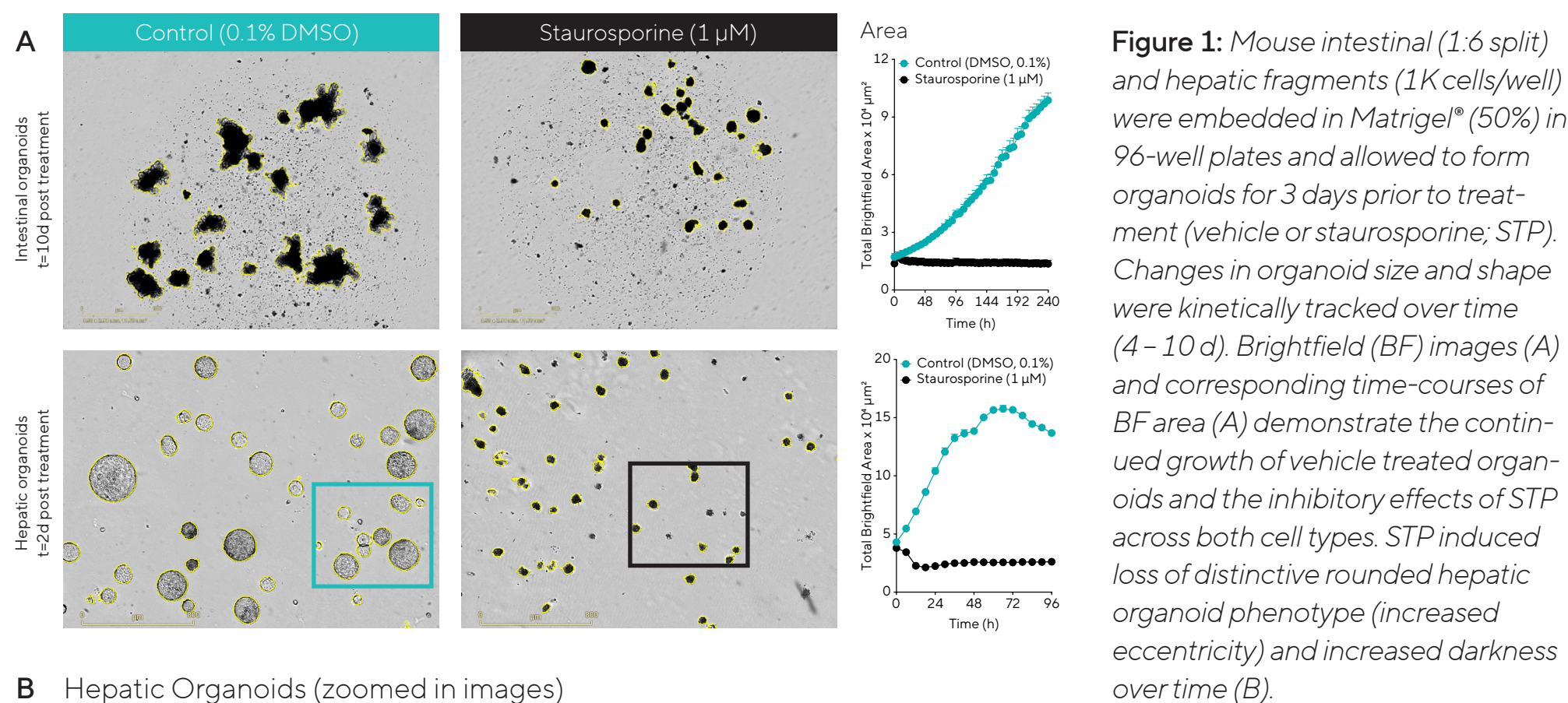
¹ Sartorius, Royston, Hertfordshire, UK

* Corresponding author: kalpana.barnes@sartorius.com

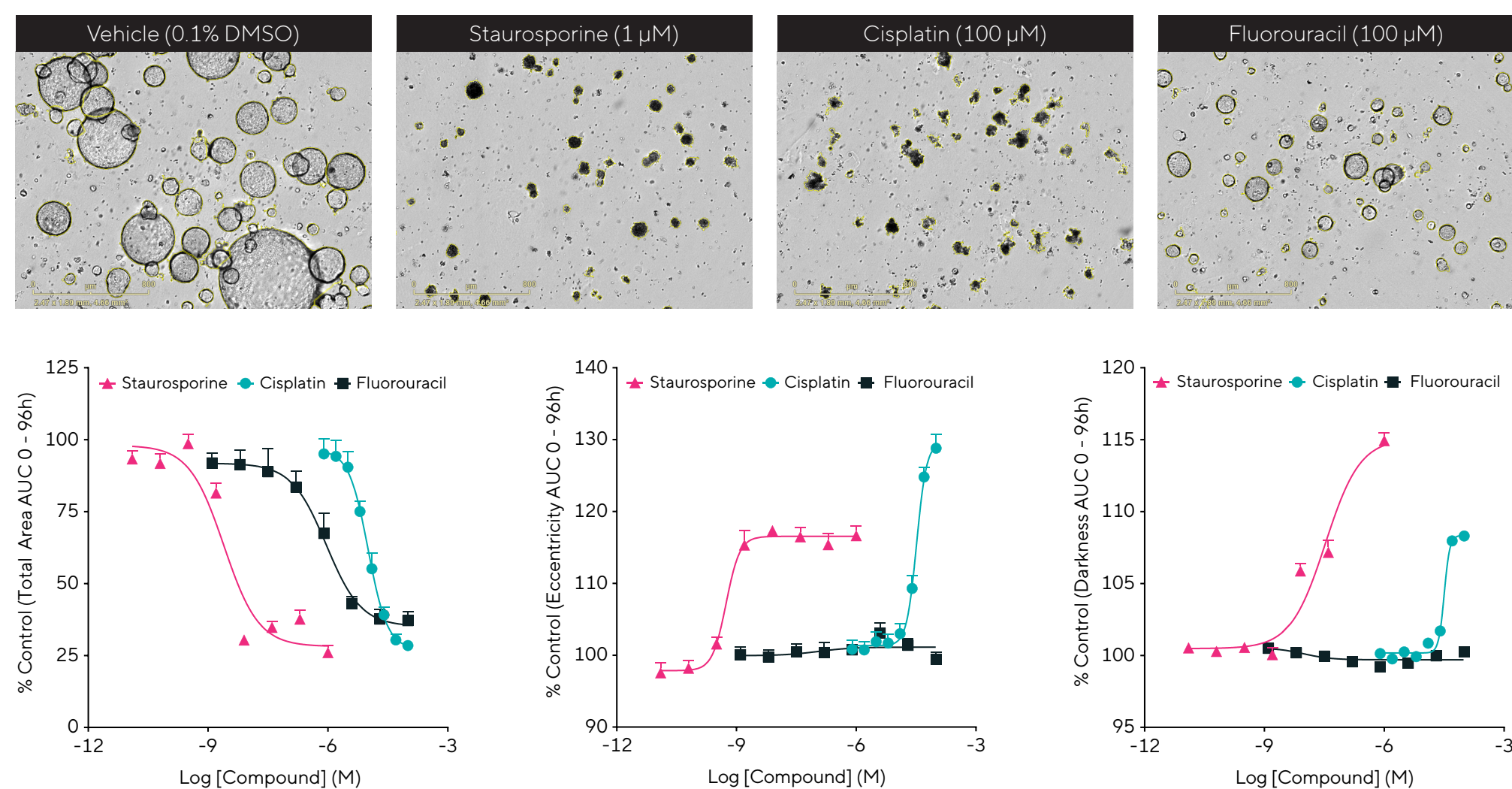
Summary and Impact

As organoids exhibit structural, morphogenetic, and functional properties that recapitulate *in vivo* pathophysiology, they are increasingly being used *in vitro*. To successfully use these models across a variety of research disciplines and applications, technology pipelines to image & quantify these complex structures are key. Here, we demonstrate simple, robust workflows for monitoring and quantifying organoid growth, death and morphology. Incucyte®s Organoid Analysis Software Module enables the ability to kinetically visualize and quantify distinct organoid morphologies embedded in Matrigel®. These validation data demonstrate the ability to characterize the differentiation and maturation of organoid cultures in 24-well plates and assess treatment effects on organoid growth in 96-well microplates. Integrated, label-free size and morphology metrics enabled real-time elucidation of intracellular pathway modulation. These data exemplify the amenability of this approach for real-time compound profiling and mechanism of action studies.

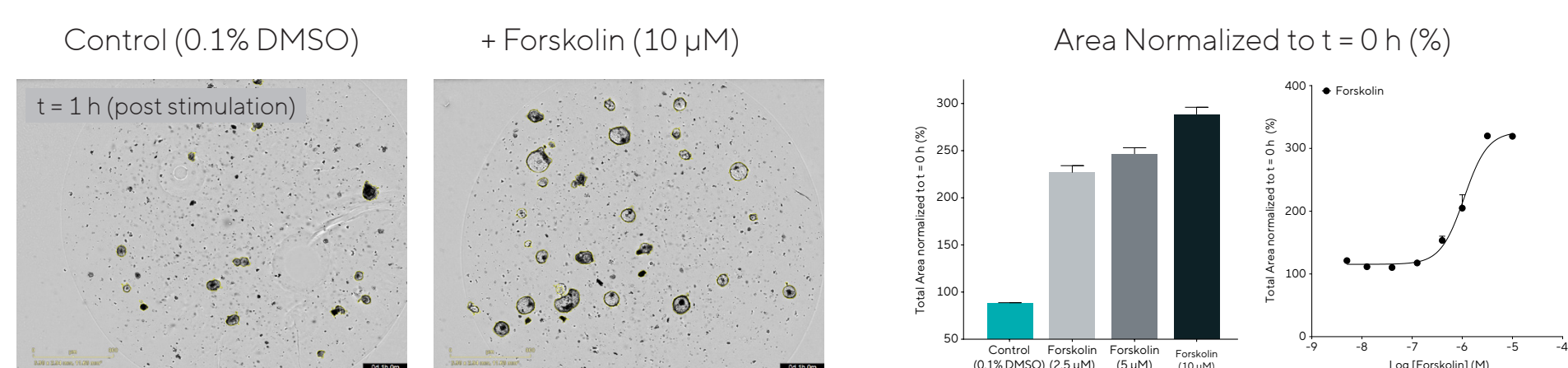
Label Free Quantification of Organoid Growth and Death



Probing Mechanisms of Action Using Morphology Metrics



Organoid Enlargement in Response to Forskolin Stimulation



Incucyte® System for Live-Cell Analysis: Methodology

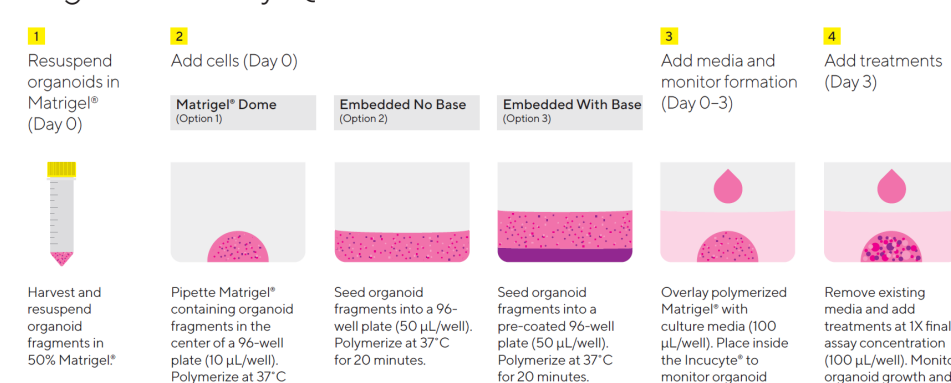
Incucyte® Live-Cell Analysis System
A fully automated phase contrast and multi-color fluorescence system that resides within a standard cell incubator for optimal cell viability. Designed to scan plates and flasks repeatedly over time.

Incucyte® Software
Fast, flexible and powerful control hub for continuous live-cell analysis comprising image acquisition, processing and data visualization.

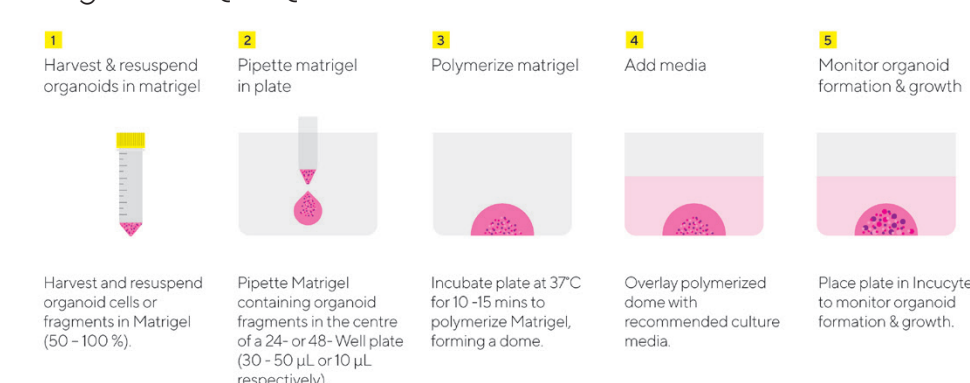
Sartorius Reagents and Consumables
A suite of reagents, kits and protocols for cell health and function screening.

Assay Workflows

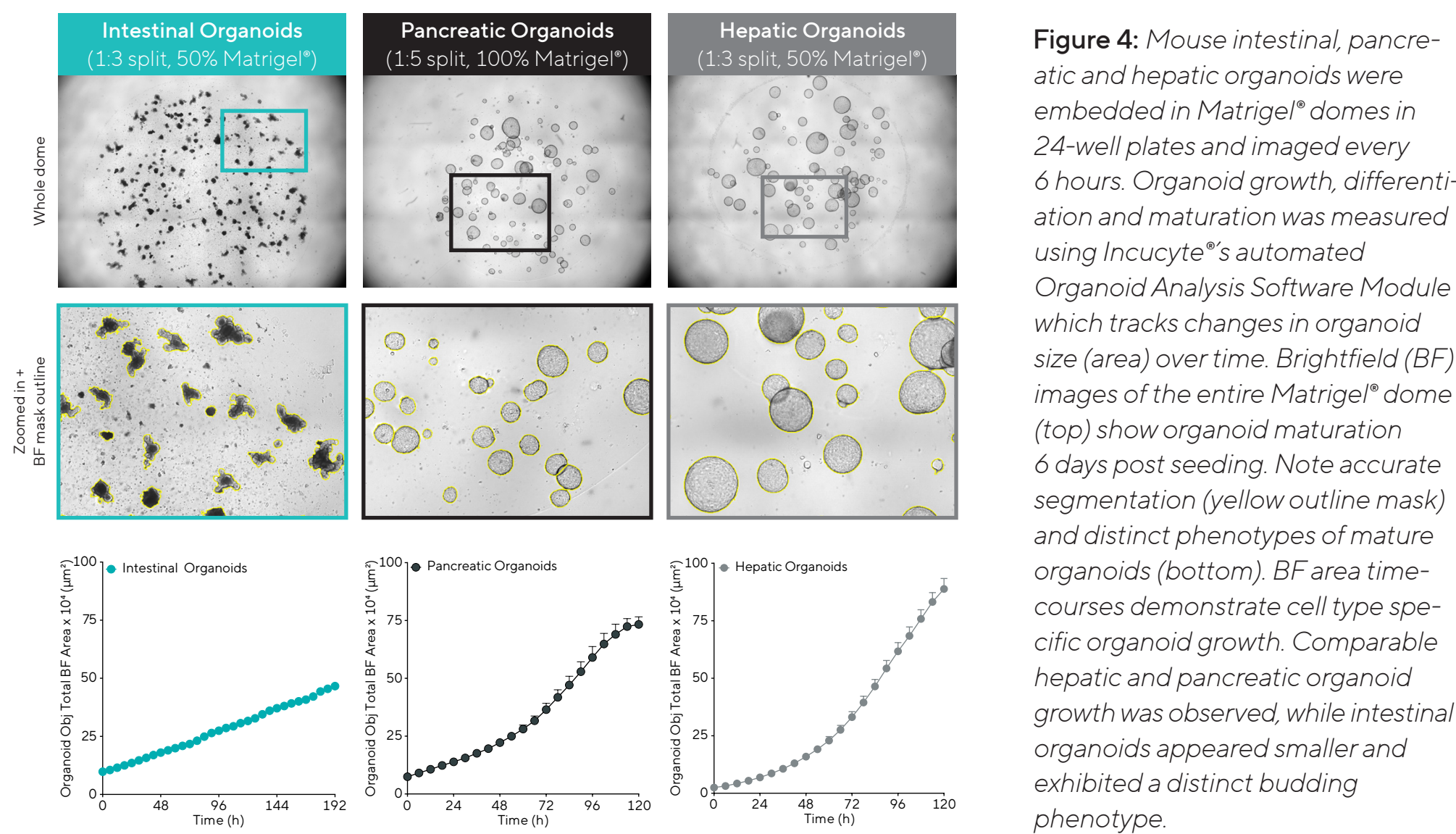
Organoid Assay Quick Guide



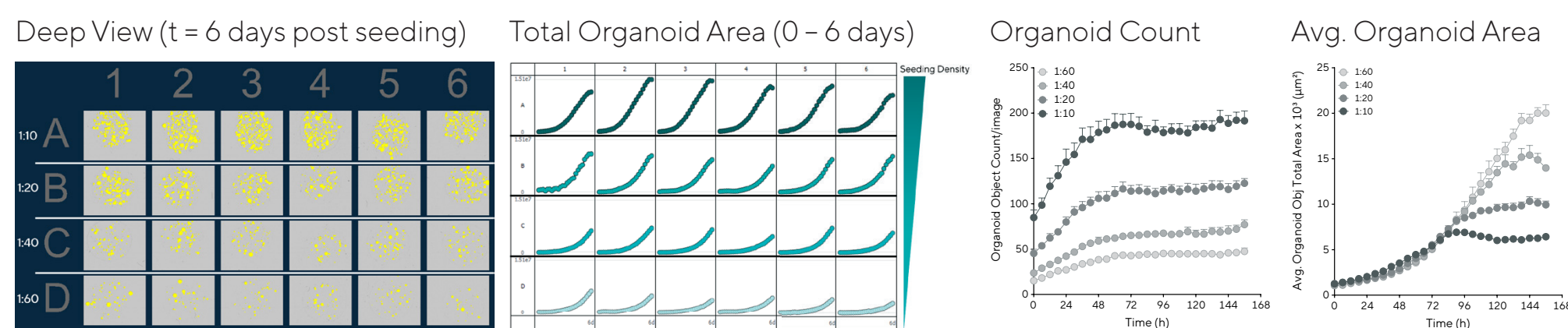
Organoid QC Quick Guide



Monitoring and Quantifying Organoids in Matrigel® Domes



Real-Time Visualisation & Quantification of Culture Conditions



Growth & Differentiation Efficiency Across Multiple Passages

