emulate

Protocol for Emulate Organ-Chips:

Bright-Field & Phase-Contrast Imaging

March 28, 2019

EP123 v1.0

Goals:	Key Steps:	Other Required Materials:
Image cells in Emulate Organ-Chips	• Assessment of cell morphology via bright-field microscopy • If better visualization of cellular structure is required, use a phase-contrast condenser	• Bright-field microscope • Phase-contrast condenser

1. Method

1. Place Pod™ module, with Organ-Chip attached, under the microscope condenser. Start with the 10x objective.
2. Focus on the membrane, which is distinguished by hexagonally-packed pores (see representative image in Fig. 1), then move the Pod until the objective is clearly under the chip channels.
3. Adjust fine focus, moving slightly upwards to locate cells of interest in the top channel of the chip. Typically, it is easier to identify cells in the top channel when looking at the co-culture region of the chip. In order to visualize the cells in the bottom channel, the clearest region is usually in the inlet or outlet of the bottom channel. (See representative image in Fig. 2.)
4. Once the appropriate region and cell type has been identified, adjust the magnification as desired, then refocus using the fine-focus adjustment.
5. Inspect the entire length of the channel at the desired magnification to assess morphology of the cells and uniformity of cell quality throughout the chip. This is essential to produce good data.
6. For cells in the top channel, acquire images at three different areas of the channel (inlet, middle, and outlet). The middle can be localized by the presence of vacuum channel lines that are perpendicular to the main channel of the chip.
7. For cells in the bottom channel, inspect cell morphology and acquire images at the inlet and outlet areas if imaging in the co-culture area is impeded by the cells of the top channel.
8. Assess morphology at any time during the culture process and track any changes in cellular morphology over time.

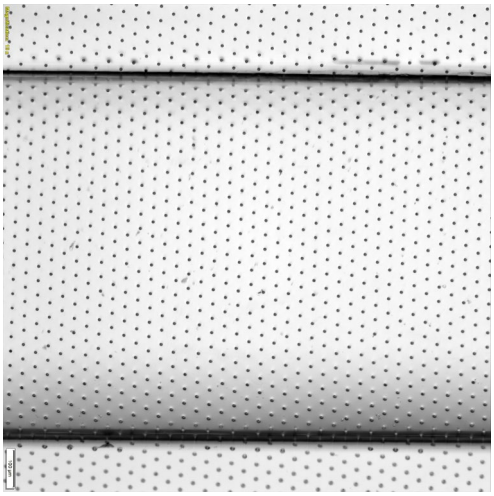

Figure 1: Membrane pores visualized at 10x magnification; Chip-S1™ channel sidewalls are clearly visible.

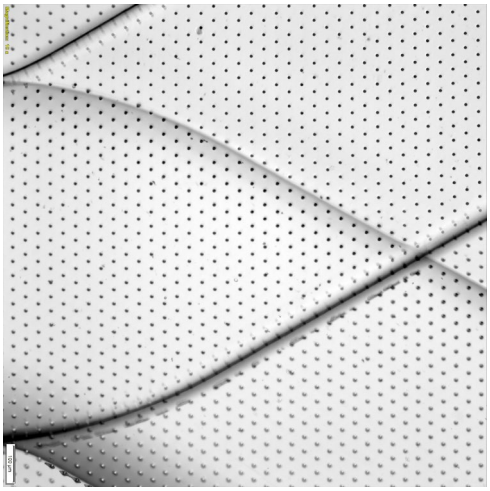

Figure 2: Intersection of top and bottom channels visualized at 10x magnification.