Multicontrast Microscopy Technique to Dynamically Fingerprint Live-cell Focal Contacts during Exposure and Replacement of a Cytotoxic Medium

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ABSTRACT

Multicontrast microscopy techniques were used to comprehensively and dynamically map the cellular contact area adhering to a substrate. The natural fringe patterns observed with interference reflection contrast microscopy were used to map the dynamic fingerprint of a porcine pulmonary artery endothelial cell's ventral surface and to examine the focal and/or close contacts to the substrate when exposed to a toxic agent Cytochalasin D. In addition, differential interference contrast microscopy sequentially imaged the overall cellular morphological responses to the agent. It was observed that focal contacts, which are tightly attached to the substrate, are strongly resistant to even high doses of the cytotoxic agent and that they also form the basis of cellular recovery after replacement of the cytotoxic medium with fresh medium.