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Wetting of silicone oil onto a cell-seeded substrate YONGJIE LU, YAU KEI CHAN, YOUCHUANG CHAO, HO CHEUNG SHUM, The Univ of Hong Kong — Wetting behavior of solid substrates in three-phase systems containing two immiscible liquids are widely studied. There exist many three-phase systems in biological environments, such as droplet-based microfluidics or tamponade of silicone oil for eye surgery. However, few studies focus on wetting behavior of biological surfaces with cells. Here we investigate wetting of silicone oil onto cell-seeded PMMA sheet immersed in water. Using a simple parallel-plate cell, we show the effect of cell density, viscosity of silicone oil, morphology of silicone oil drops and interfacial tension on the wetting phenomenon. The dynamics of wetting is also observed by squeezing silicone oil drop using two parallel plates. Experimental results are explained based on disjoining pressure which is dependent on the interaction of biological surfaces and liquid used. These findings are useful for explaining emulsification of silicone oil in ophthalmological applications.

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