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**Collective cell behavior on basement membranes floating in space**
SARAH ELLISON, TAPOMOY BHATTACHARJEE, CAMERON MORLEY, W. SAWYER, THOMAS ANGELINI, University of Florida — The basement membrane is an essential part of the polarity of endothelial and epithelial tissues. In tissue culture and organ-on-chip devices, monolayer polarity can be established by coating flat surfaces with extracellular matrix proteins and tuning the trans-substrate permeability. In epithelial 3D culture, spheroids spontaneously establish inside-out polarity, morphing into hollow shell-like structures called acini, generating their own basement membrane on the inner radius of the shell. However, 3D culture approaches generally lack the high degree of control provided by the 2D culture plate or organ-on-chip devices, making it difficult to create more faithful *in vitro* tissue models with complex surface curvature and morphology. Here we present a method for 3D printing complex basement membranes covered in cells. We 3D print collagen-I and Matrigel into a 3D growth medium made from jammed microgels. This soft, yielding material allows extracellular matrix to be formed as complex surfaces and shapes, floating in space. We then distribute MCF10A epithelial cells across the polymerized surface. We envision employing this strategy to study 3D collective cell behavior in numerous model tissue layers, beyond this simple epithelial model.

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