ADVANCED FUNCTIONAL MATERIALS

Supporting Information

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Rapid Self-Assembly of Macroscale Tissue Constructs at Biphasic Aqueous Interfaces

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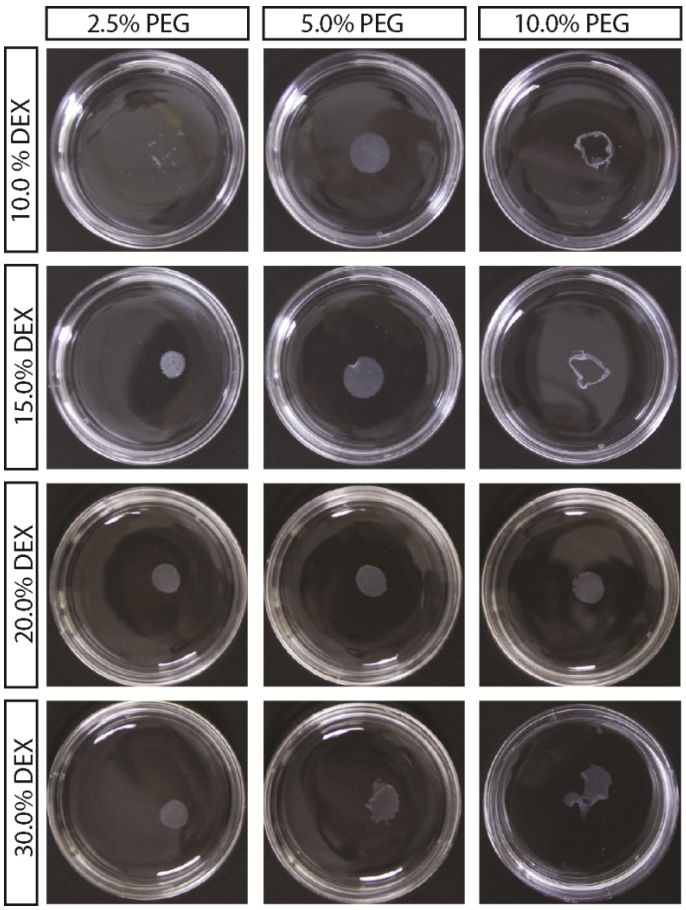

Figure S1. Optimization of ATPS polymer concentrations. If the concentrations of PEG and DEX (as % wt.) are too high or too low, non-optimal interfacial forces can result in constructs with irregular morphologies. Constructs are shown in 35 mm dishes.

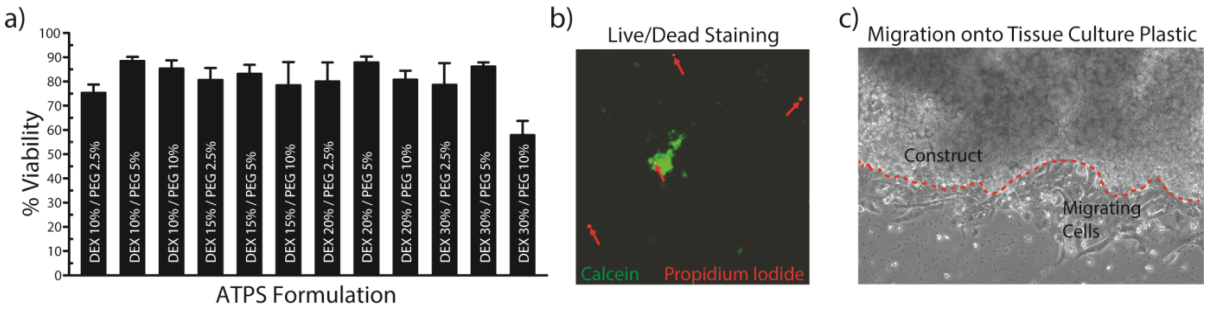

Figure S2. Viability of cell constructs formed at the ATPS interface. a) The percentages of viable cells from the constructs were measured by live/dead staining for calcein (green) and propidium iodide (PI, red), using phase contrast images for reference. Images were quantified by a blinded examiner. The percentages of live cells were calculated according to %Viability= 100 X (Total Cells - PI^+ Cells)/Total Cells. Bars represent standard error of the mean. b) A representative image of calcein/PI-stained cells from a MCF10A construct dissociated using trypsin and gentle pipette tip trituration. The dissociation protocol may have contributed to a small reduction in overall cell viability. PI-positive cells are indicated by red arrows. c) Cell constructs readily attached to tissue culture plastic. Viable cells were observed to migrate outwards from the construct edges after 1-2 days.

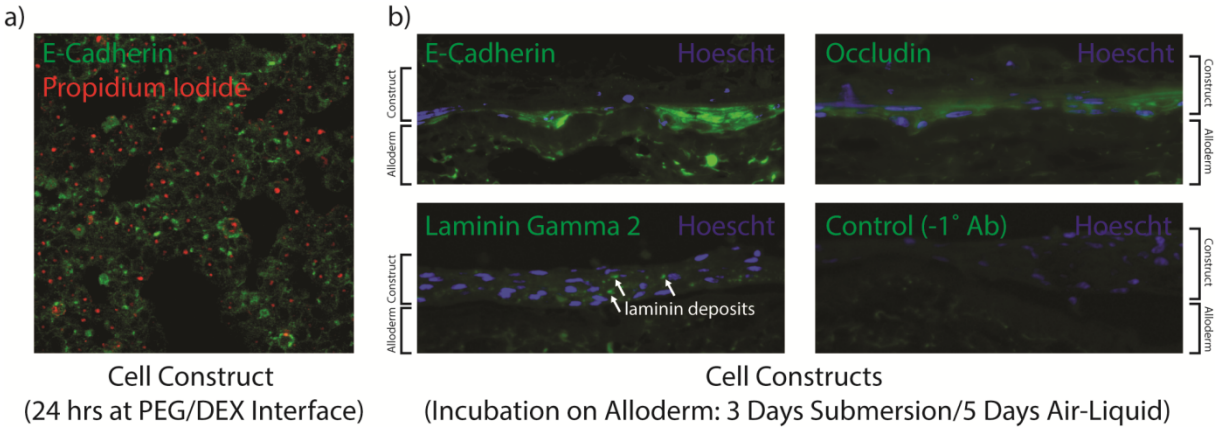

Figure S3. Formation of cell-cell junctions after construct formation. a) Confocal fluorescence imaging (top-view optical sections) of MCF10 cell constructs immunolabeled for E-cadherin (green) revealed the formation of adherens junctions between cells after 24 hours of incubation at the PEG/DEX interface. PI (red) was used as a nuclear counterstain post-fixation. b) Primary human keratinocyte constructs integrated with Alloderm (3 days submersion culture followed by 5 days at an air-liquid interface) expressed E-cadherin, along with occludin (tight junctions) and laminin gamma 2 (basement membrane), as observed by immunofluorescence staining (side view epifluorescence images of tissue sections). The following antibodies were used: mouse anti-CDH1/E-cadherin (Sigma), rabbit anti-occludin (Sigma), rabbit anti-laminin gamma 2 (Thermo-Fisher), Alexa-488 goat anti-mouse (Life Technologies), Alexa-488 goat anti-rabbit (Life Technologies) and Alexa-594 goat anti-rabbit (Life Technologies). Samples incubated with only the secondary antibody (-1° Ab) were used as controls.