Supporting Information

Dehydrated Aqueous Two-Phase System Micro-domains Retain Shape upon Rehydration to Allow Patterned Reagent Delivery to Cells

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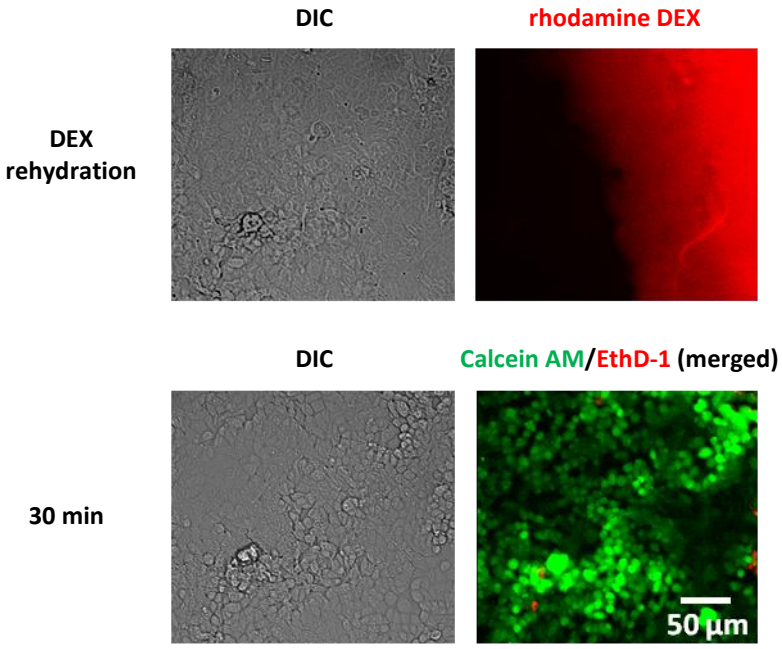
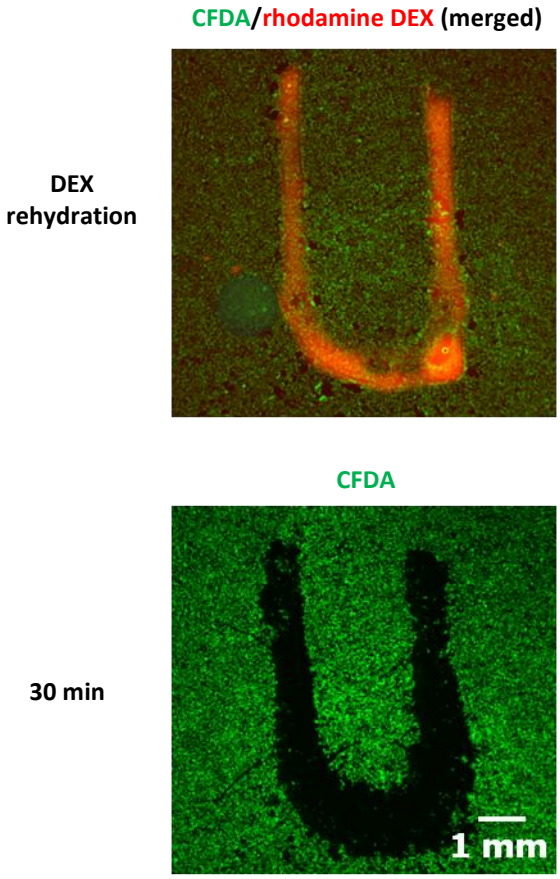
Supporting Information 1 (Movie): Dehydration of DEX T500 (16%$_{w/v}$) in a 600×1800 µm micro-reservoir oblong on one extremity and rectangular on the other one. The general view was recorded with a Handycam HDR-CX200 Sony and the magnified view with a Keyence Digital microscope VHX 600 equipped with a ×100 lens VHZ100R.

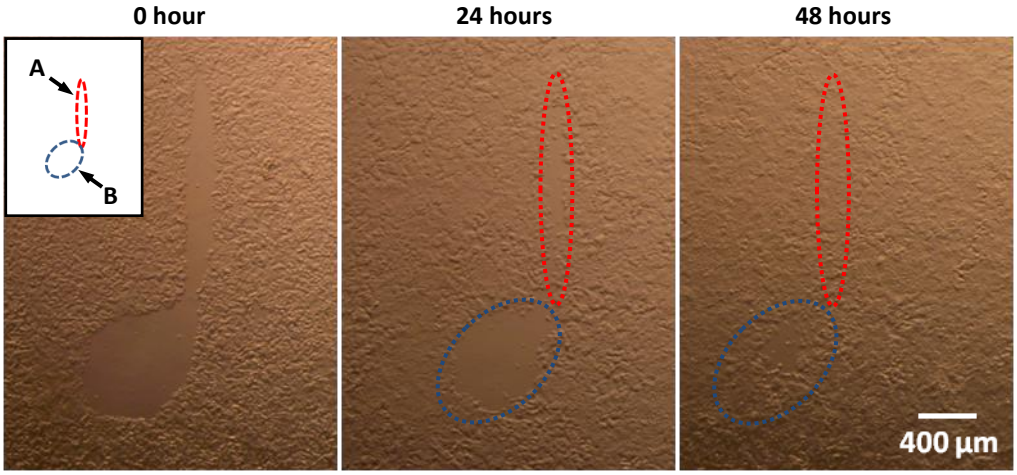
Supporting Information 2 (Movie): Rehydration of a 600×1800 µm DEX T500 (16%$_{w/v}$) patch on a MCF-7 monolayer via PEG 35000 (16%$_{w/v}$). The general view was recorded with a Handycam HDR-CX200 Sony and the magnified view with a Keyence Digital microscope VHX 600 equipped with a ×100 lens VHZ100R.



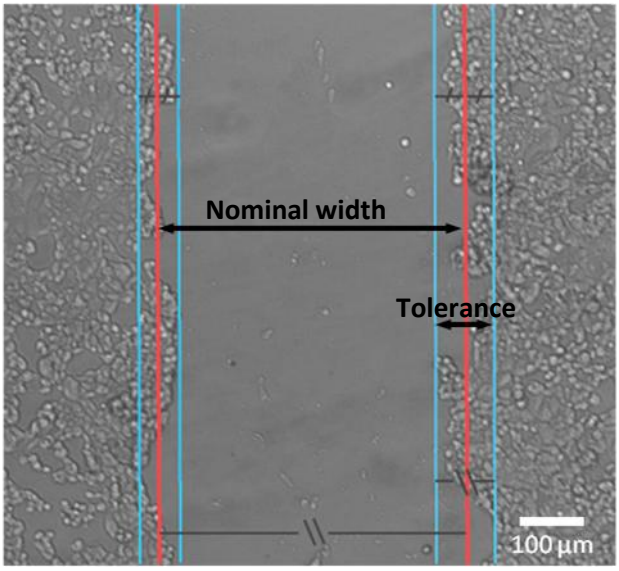
Supporting Information 3: Viability of MCF-7 exposed to a rehydrating DEX patch. A triangular shaped patch of DEX 16%$_{w/v}$ containing rhodamine-DEX was deposited on a confluent monolayer of MCF7 and rehydrated into its original shape through a buffer solution containing PEG 16%$_{w/v}$. DIC (top left) and red fluorescence (top right) pictures show the position of the rehydrated patch on the MCF-7 cells monolayer. After removal of the ATPS, the MCF-7 cells were stained with Calcein AM (green) and EthD-1 (red) to label live and dead cells, respectively. DIC (bottom left) and fluorescent images (bottom right) were taken 30 min after the DEX patch removal and showed no substantial viability decrease among cells subjected to patch placement and submersion in the rehydrating patch.



Supporting Information 4: Wound patterning on MCF7 using Trypsin loaded DEX patch. A "**U**" shaped patch of DEX 16%$_{w/v}$ containing Trypsin was deposited on a confluent monolayer of CFDA loaded cells and rehydrated into its original shape through a buffer solution containing PEG 16%$_{w/v}$ (Left). Localized wash out of the ATPS with buffer solution left a patterned U wound (Right).



Supporting Information 5: Wound patterning using trypsin loaded sulfate DEX patch. A reagent loaded patch featuring two geometries (ellipse A and B showed in the inset and outlined on the pictures in red and blue respectively) with the same perimeters but with two different areas (B twice greater than A) allows assay of the effects of geometrical wound attributes on the wound healing process. Recording of the healing process after 24 and 48 hours showed faster healing for the wound A, with a measured wound healing at 48 hours of 95.3% and 87.6% for A and B, respectively. The narrow geometries thus allow sensitive detection of wound healing where inhibitors reduce wound closure speed significantly while the wider spacing geometries allow easier comparison of wound closure where the healing speed is higher.



Supporting Information 6: Schematic of the wound characterization. The edges of the wound were first contoured by parallel lines (blue lines). For each edge, the contour lines defined the tolerance or the ability to produce a linear edge. Second, the median line from both parallel lines of an edge contour was drawn (red lines).The nominal width of the wound was evaluated by the distance between those two parallel median lines.