Drug-eluding microarrays for cell-based screening of chemical-induced apoptosis

Cheong Hoon Kwon[a,b], Ian Wheeldon[a,b,c], Nezamoddin N. Kachouie[a,b], Seung Hwan Lee[a,b], Hojae Bae[a,b], Shilpa Sant[a,b,c], Junji Fukuda[d], Jeong Won Kang[e,*] and Ali Khademhosseini[a,b,c,*]

[a] Center for Biomedical Engineering, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston, MA 02115

[b] Harvard-MIT Division of Health Sciences and Technology, Massachusetts Institute of Technology, Cambridge, MA 02139

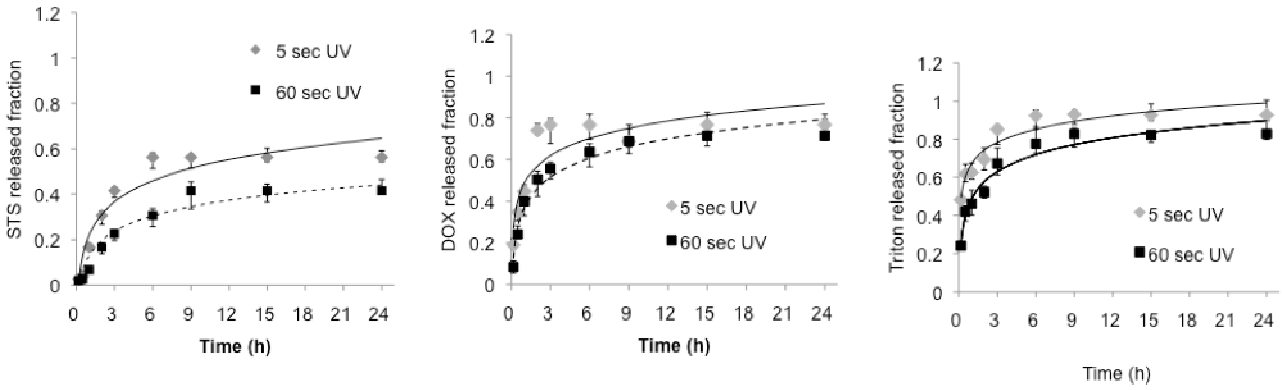
[c] Wyss Institute for Biologically Inspired Engineering, Harvard University, Boston, MA, 02115

[d] Graduate School of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Japan 305-8573

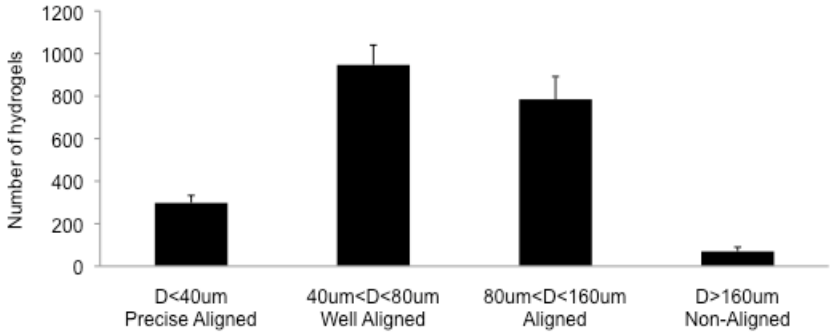
[e] Department of Chemical and Biological Engineering, Korea University, 5-Ga Anam-Dong, Sungbuk-Ku,Seoul, South Korea 136-701

* Corresponding authors: Ali Khademhosseini, alik@rics.bwh.harvard.edu, Jeong Won Kang, jwkang@korea.ac.kr

Supporting Information

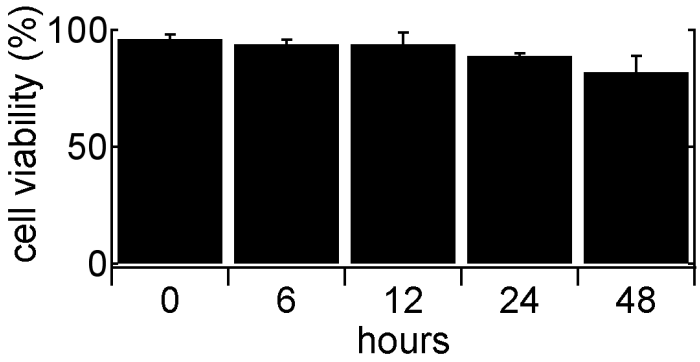


SFigure 1. Chemical release from PEGDA hydrogels. Release profile of 10 μM STS (A), 10 μM DOX, and 0.1 % Triton X-100 (C), over a 24 hour period with 5 and 60 seconds of UV exposure. The release of each compound was measured from 1μL gels placed in 100 μL of PBS solution. Chemical release was monitor by UV-Vis spectrometry at 495 nm for doxorubicin, 292 nm for staurosporine, and 280 nm for Triton X-100.



SFigure 2. Device alignment accuracy. The number of hydrogels with a distance between the center point of the hydrogel and the center of the aligned microwell that is less than 40 μm, between 40 and 80 μm, between 80 and 160 μm, and greater than 160 μm. Hydrogels and microwells are considered

misaligned if the distance between the center of each is greater than 160 μm. The average alignment accuracy is 96.7% (n = 3).



SFigure 3. HEPG2 viability in sealed microwell cultures.

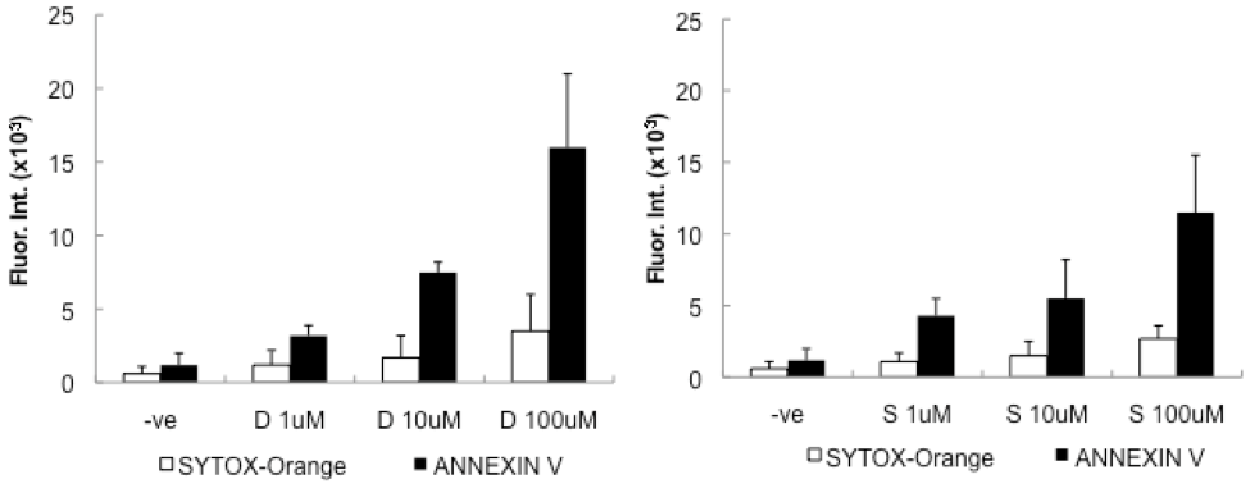
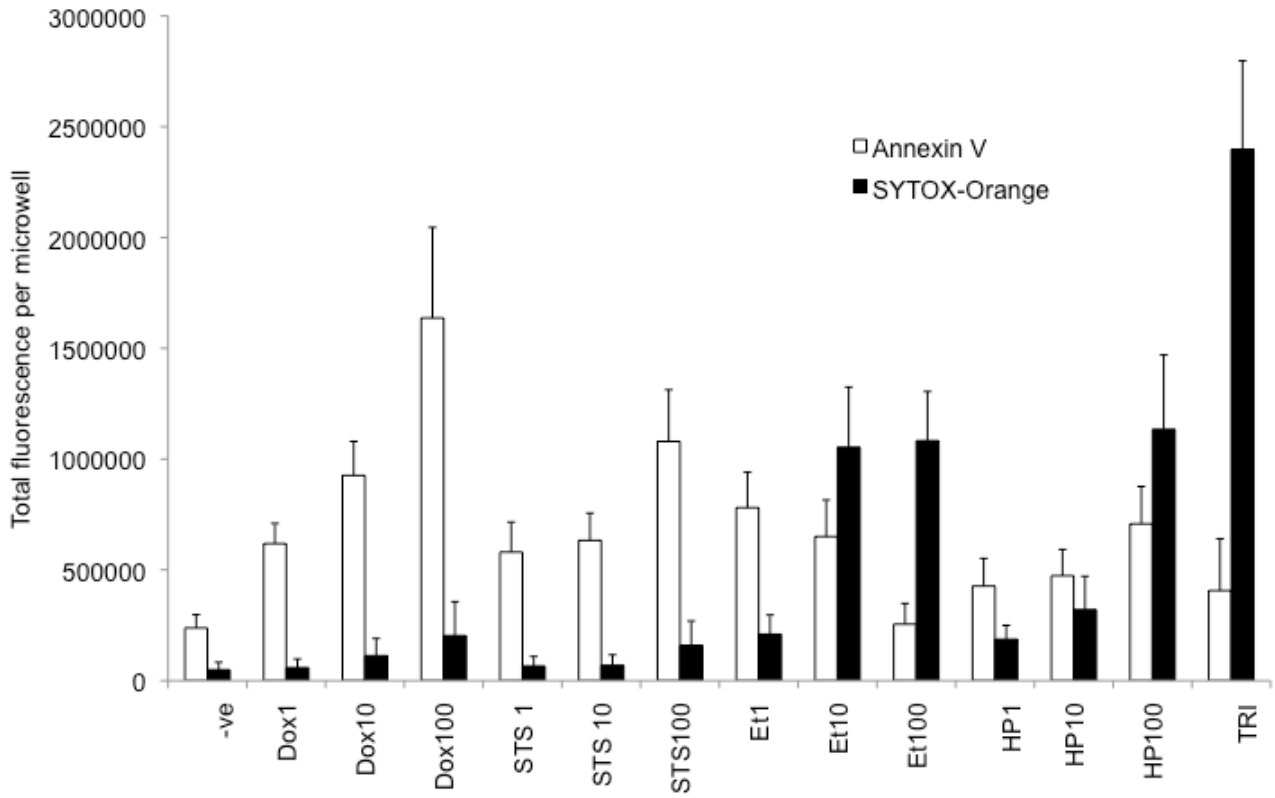


Figure 4. DOX and STS apoptotic assays in 96-well plate format. The fluorescence intensity of annexin V-APC and SYTOX Orange of MCF-7 cells exposed to 0, 1, 10 and 100 μM of DOX and STS for 12 hours.



SFigure 5. Annexin V-APC and STOX Orange fluorescent intensity for DOX, STS, ethanol, and hydrogen peroxide.