Electronic Supplementary Material (ESI) for Lab on a Chip.

Table S1. Materials, part numbers, and cost analysis on the construction of one bioreactor-integrated fluorescence mini-microscope. Price updated June 5th, 2015.

Material	Source and Product Number	Number of Pieces	Unit Cost ($)	Total Cost ($)
Webcam	Logitech C-160	1	5.990	5.990
3 mm PMMA sheet	McMaster Carr 8560K239	1/5	8.630	1.726
4/40 RH Slot Mach Screw	Allied Bolt RSMSZ4401	4	0.046	0.185
4/40 Hex Machine Nut	Allied Bolt HMSNZ440	16	0.034	0.547
White LED	Deals extreme SKU 1105	1	0.143	0.143
Green LED	Deals extreme SKU 9076	1	0.154	0.154
Blue LED	Deals extreme SKU 9077	1	0.143	0.143
Blue LED	Deals extreme SKU 9077	1	0.143	0.143
			Total Cost ($)	**9.03**

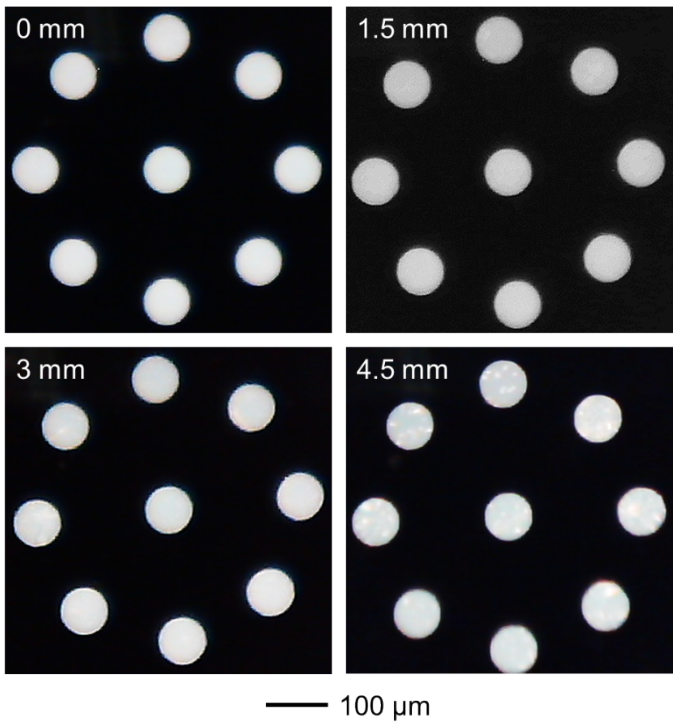


Figure S1. Mini-microscopic images of the same pattern obtained at working distances of 0, 1.5, 3, and 4.5 mm, respectively. The maximum working distance of the mini-microscope with an 8X magnification was 4.5 mm.

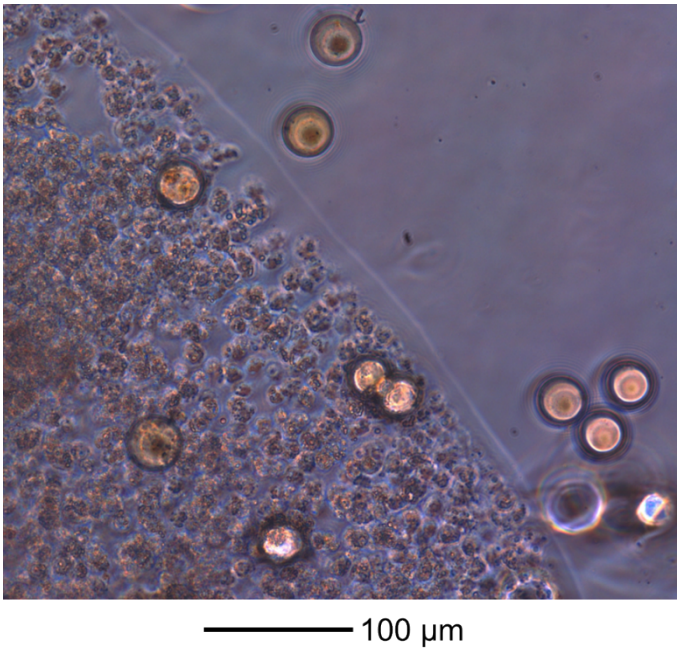


Figure S2. Microscopic images showing the setup of the oxygen detection with two layers of GelMA with inner layer encapsulating beads and HepG2 cells together and outer layer encapsulating beads only.

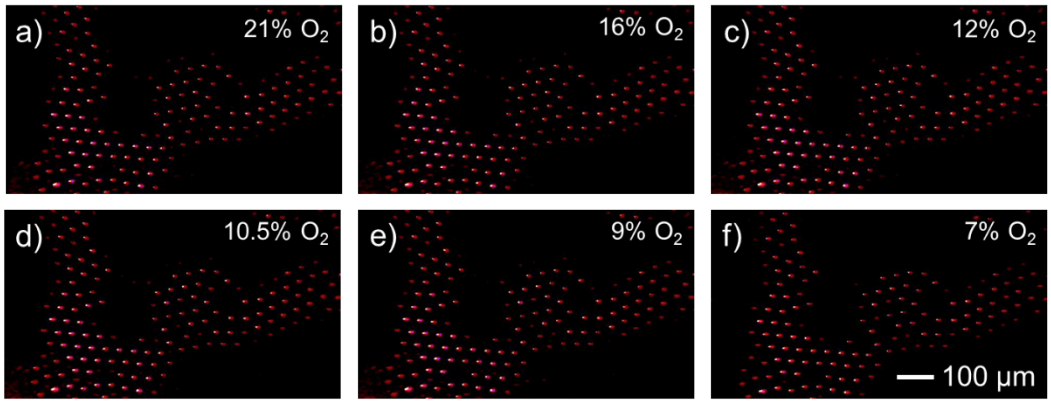
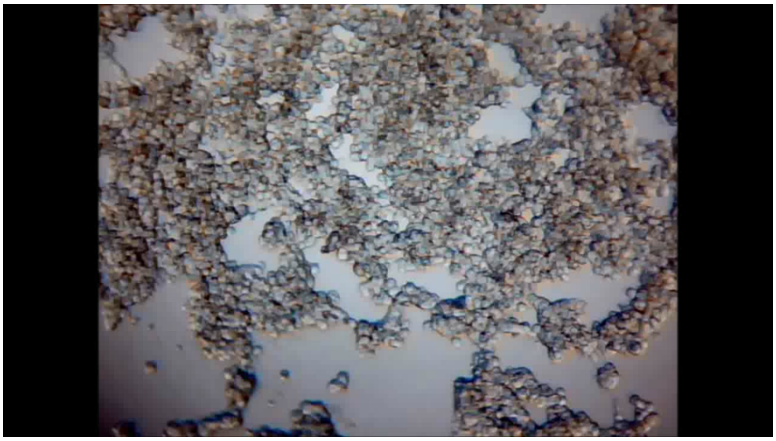
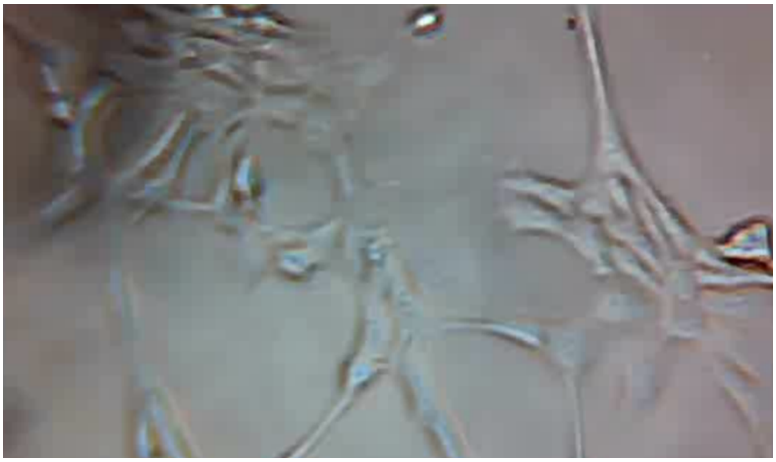


Figure S3. Fluorescence images obtained from the mini-microscope showing beads at different oxygen concentrations. The Nile Blue channel was used for imaging.



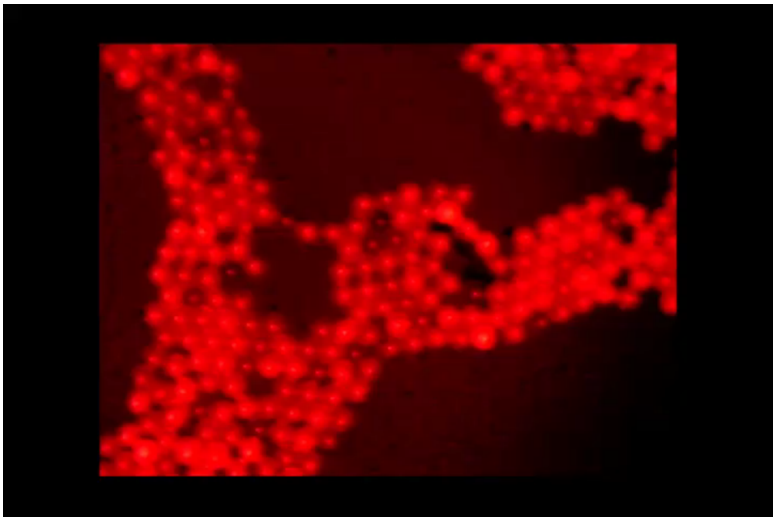
Movie S1. Movie showing the migration of HepG2 cells cultured at the bottom of the bioreactor over a course of 24 h. The magnification was 8X and the video was replayed at a speed of 4000X.



Movie S2. Movie showing the migration of NIH/3T3 fibroblasts cultured at the bottom of a bioreactor over a course of 2.5 h. The magnification was 8X and the video was replayed at a speed of 2000X.

Movie S3. Movie showing the beating of cardiomyocytes cultured on CNT-GelMA substrate placed at the bottom of the bioreactor. The magnification was 8X and the movie was replayed in real time.

Movie S4. Movie showing the change in fluorescence intensity from the ruthenium-PDMS microbeads over 21-0% O_2 levels captured by the mini-microscope. The magnification was 8X and the video was replayed at a speed of 0.125X.



Movie S5. Movie showing the change in fluorescence intensity from the ruthenium-PDMS microbeads over 0-21% O_2 levels captured by the mini-microscope. The magnification was 8X and the video was replayed at a speed of 0.125X.