

Materials List for:

Rapid Subtractive Patterning of Live Cell Layers with a Microfluidic Probe

Aditya Kashyap¹, Julien F. Cors¹, Robert D. Lovchik¹, Govind V. Kaigala¹

¹IBM Research - Zurich

Correspondence to: Govind V. Kaigala at gov@zurich.ibm.com

URL: <https://www.jove.com/video/54447>

DOI: [doi:10.3791/54447](https://doi.org/10.3791/54447)

Materials

Name	Company	Catalog Number	Comments
Materials			
Microfluidic Probe (MFP)			Silicon/glass hybrid probe head with channels patterned in silicon. Fabrication done in-house at IBM Research - Zürich
Lab Tek II Chamber slides with 2 chambers	ThermoFisher scientific, USA	154461	2 Chamber chamber slides for cell culture with each chamber providing an area of 4 cm ² and capable of holding up to 3 ml of media volume
Chemicals and cell lines			
Sodium Hydroxide, Tris-Cl, Ethylenediaminetetraaceticacid, Rhodamine B	SigmaAldrich chemicals, USA	S5881, 252859, E9884, R6626	Chemicals used for processing and shielding liquids
Proteinase K	Qiagen, Germany	19131	protease to digest denatured proteins
Deconex 16 Plus	Bohrer Chemie, Switzerland		Universal cleaning agent for laboratory consumables. Used for non stringent cleaning.
DNA away	ThermoFisher scientific, USA	7010	Surface decontaminant that denatures DNA and DNAases.
DMEM, high glucose, GLUTAMAX supplement	ThermoFisher scientific, USA	10566-016	Culturing medium for epithelial cells.
CellTracker Green CMFDA dye	ThermoFisher scientific, USA	C7025	Membrane permeant live cell labeling dye. Dye active for 72 hours.
CellTracker Orange CMRA dye	ThermoFisher scientific, USA	C34551	
β-actin genomic primers for qPCR	Integrated DNA technologies, USA		Custom oligos used for DNA quality validation and qPCR.
MCF7 breast carcinoma cells	ATCC, USA	ATCC HTB-22	Cell lines used to produce co-cultures.
MDA-MB-231 breast carcinoma cells	ATCC, USA	ATCC HTB-26	
Equipment and fluidic connections			
Motorized high precision stages	Custom machined components. Linear axis motors from LANG GmbH, Germany	Customized linear axis stages from LT series	3 × LT for 3 axes. LSTEP controller used for interfacing stages and PC through RS 232 port.
Syringes	Hamilton, Switzerland	1700 TLLX series	Interchangeable with syringes provided by other manufacturers with a 250-500 µl range.
Nemesys low pressure syringe pumps	cetoni GmbH, Germany		Component of pumping station.

Circular M1-connector	Dolomite microfluidics, United Kingdom	3000051	Interface between vias in MFP head and tubing
Tilt/rotation stage Goniometer	OptoSigma, USA	KKD-25C	Goniometer to adjust coplanarity of MFP apex
DS Fi2 HD color camera (CCD)	Nikon, Switzerland		Controlled using DS-U3 controller unit
Software			
Win - Commander	LANG GmbH, Germany		Stage control software.
Qmix Elements	cetoni GmbH, Germany		Pump control software.
NIS Elements	Nikon, Switzerland		Basic research module for image acquisition and analysis.