

Computer Numerical Control Micromilling of a Microfluidic Acrylic Device with a Staggered Restriction for Magnetic Nanoparticle-based Immunoassays

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Citation

Hernández-Ortiz, J.A., Guevara-Pantoja, P.E., Andrade-Medina, M., Carrillo-Tripp, M., Caballero-Robledo, G.A. Computer Numerical Control Micromilling of a Microfluidic Acrylic Device with a Staggered Restriction for Magnetic Nanoparticle-based Immunoassays. *J. Vis. Exp.* (184), e63899, doi:10.3791/63899 (2022).

Date Published

June 23, 2022

DOI

10.3791/63899

URL

jove.com/video/63899

Materials

Name	Company	Catalog Number	Comments
0.008 Endmill	KYOCERA SGS	2204	2FL 0.008x1/8x0.12x1-1/12
0.032 Endmill	KYOCERA SGS	2228	2FL 0.032x1/8x0.48x1-1/12
Carbonyl-iron microparticles	Sigma-Aldrich	44890	7 µm
Chloroform	Fermont	6201	Health Hazard: Moderate Flammability: None Reactivity: None Contact Hazard: Moderate
CMOS camera Moment	Teledyne Photometrics		Sensor Technology: CMOS Quantum Efficiency: 73% Pixel Size: 4.5 µm x 4.5 µm Supported Interfaces: USB 3.2 Gen 2
Dr Engrave Software	Roland DGA Corporation		Engraving software to design and create the engraving path on the surface
Extraction hood	Unknown	Unknown	
Flexible Plastic Tubing	Tygon	AAD04103	ID = 0.020, OD = 0.060
Fluorescence microscope	ZEISS	Axio Vert.A1	
High Precision Dispense Needle	Loctite	98612	
Homemade piezoelectric controller application	LabView		See reference 12 for more details.
Loctite 495 instant adhesive	Henkel	49503	Apply with micropipette tip or dispensing needle
MagJET Separation Rack	thermoscientific		12 x 1.5 mL
Mechanic press	Home-made		
Milling Machine	Roland	MDX-50	
Piezoelectric platform	Home-made		See reference 12

Polymethylmethacrylate - Sheet - PMMA, Acrylic	Goodfellow	ME303018/1	Thickness: 1.3 mm, Transparency: Clear/Transparent
PVCamTest software	Teledyne Photometrics	Version 3.10.107	Image acquisition software
Stereo microscope	Nikon	SMZ 7457	
SuperMag Carboxyl Beads	Ocean NanoTech	KSC0100	100 nm
Syringe pump	kd Scientific	KDS200	Can hold up to two syringes
Ultrasonic bath	Branson	2800	
VPanel software	Windows OS	Version 1.0.3.0	Software for controlling the micromilling machine