

Materials List for:

# Surface Enhanced Raman Spectroscopy Detection of Biomolecules Using EBL Fabricated Nanostructured Substrates

Robert F. Peters<sup>1,2</sup>, Luis Gutierrez-Rivera<sup>1,2</sup>, Steven K. Dew<sup>1,2</sup>, Maria Stepanova<sup>1,2</sup>

<sup>1</sup>Department of Electrical and Computer Engineering, University of Alberta












<sup>2</sup>National Institute for Nanotechnology, National Research Council of Canada

Correspondence to: Maria Stepanova at [ms1@ualberta.ca](mailto:ms1@ualberta.ca)









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## Materials

Name	Company	Catalog Number	Comments
11-Mercaptoundecanoic acid (MUA)	 Sigma Aldrich	450561 ALDRICH	Used for surface functionalization in Design 1
Conductive polymer	 Mitsubishi Rayon	aquaSAVE-57xs	A 70 nm thick layer is used as anti-charging coating for EBL exposures
D-glucose	Collaborator Lab.		Ligand in Design 2
Dopamine	Collaborator Lab.		Ligand in Design 3
Dopamine binding aptamer (DBA)	 Integrated DNA Technologies Inc.	5'- /Thiol Modifier C6 S-S/ AAAAAAAAAA GTCTCTGTGT GCGCCAGAGA AACTG GGGC AGATATGGGC CAGCACAGAA TGAGGCC-3'	Biopolymer in Design 3
Fused silica wafers	 Mark Optics		
Glucose binding protein (GBP)	 Collaborator Lab.	PDB ID 2HPH	Biopolymer in Design 2
High vacuum grease	 Dow Corning		Used to seal water-proof chamber
Hydrogen Peroxide 30%, H <sub>2</sub> O <sub>2</sub>	J.T. Baker		Used for piranha solution
N-ethyl-N'-(3-(dimethylamino) propyl) carbodiimide (EDC)	 Sigma Aldrich	03450 FLUKA	Used for immobilization of biopolymer in Design 1
N-Hydroxysuccinimide (NHS)	 Sigma Aldrich	130672 ALDRICH	Used for immobilization of biopolymer in Design 1
Potassium phosphate buffer	Collaborator Lab.		Buffer used in Raman sampling
Phosphate buffered saline (PBS)	Collaborator Lab.		Solvent in Design 3
Polymethylmethacrylate (PMMA) 950 A2	 MicroChem		A 90 nm thick layer is used as EBL positive tone resist
Recombinant protein A	 Protein Mods Inc	PDB ID 1BDD	Biopolymer in Design 1
Sulfuric acid 96%, H <sub>2</sub> SO <sub>4</sub>	J.T. Baker		Used for piranha solution
Tris(hydroxymethyl)aminomethane (TRIS) and ethylenediaminetetraacetic acid (EDTA) buffer	 Sigma Aldrich	T9285 SIGMA	Buffer in Design 3

## Equipment

Name	Company	Catalog Number	Comments
Dicing saw	Diamond Touch Technology Inc. (17301 W Colfax Ave # 152, Golden, CO)		Used to cut FS wafer
Electron beam evaporator	 Kurt J. Lesker		Used for Au and Ag evaporation
Electron beam evaporator	 Johnsen Ultravac (JUV)	JuV E-gun	Used for Ni evaporation
Microscope cover slips (25 mm)	 Fisher Scientific	12-545-102	Used in water-proof chamber
Microscope slides (3×1 in.)	 Fisher Scientific		Used in water-proof chamber
Raith 150 <sup>TWO</sup> EBL exposure system	 Raith Inc.	Raith 150 <sup>TWO</sup> system	Used for EBL exposures
Raman microscope	 Thermo Scientific	Nicolet Almega XR	Used for Raman spectroscopy
Sonicator system	 Branson		Used for liftoff and solutions mixing
Spinner	 Brewer Spinner and Hotplate	Cee 200X and Cee 1300X	Used to spin-coat PMMA and conductive polymer