

Materials List for:

In Situ Characterization of *Shewanella oneidensis* MR1 Biofilms by SALVI and ToF-SIMS

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Materials

Name	Company	Catalog Number	Comments
ToF-SIMS	IONTOF	TOF.SIMS 5	Resolution:>10,000 m/Δm for mass resolution;>4,000 m/Δm for high spatial resolution
System for Analysis at the Liquid Vacuum Interface (SALVI)	Pacific Northwest National Laboratory	N/A	SALVI is a unique, self-contained, portable analytical tool that, for the first time, enables vacuum based scientific instruments such as time-of-flight secondary ion mass spectrometry (ToF-SIMS) to analyze liquid surfaces in their natural state at the molecular level.
-80°C Freezer	New Brunswick Scientific	N/A	U410 Premium Energy Efficient Ultra-Low Temperature Freezer
4°C Refrigerator	BioCold Scientific	N/A	COLDBOX1
Orbital Shaker	New Brunswick Scientific	N/A	Innova 4900 Multi-Tier Environmental Shaker, set at 30 degrees Celsius for serum bottle and flask culturing, set at 150rpm.
Syringe Pump	Cole-Parmer	EW-74905-02	Cole-Parmer Syringe Pump, Infusion Only, Touchscreen Control 74905-02, used for injecting liquid into the tubing system and SALVI at a constant flowrate.
Incubator	Barnstead International	LT1465X3	Lab-Line incubator, set at 30 degrees Celsius for plate culturing.
Autoclave	Getinge	533LS	Used to sterilize PEEK fittings, tubing systems, serum vials, and medium. Model 533LS Vacuum Steam Sterilizer
Spectrophotometer	Thermo Fisher Scientific	4001-000	GENESYS 20 spectrophotometer for OD600 readings of cuvettes for growth curves.
Biological Safety Cabinet	Thermo Fisher Scientific	1385	1300 Series AZ Biological Safety Cabinet
Fluorescence Microscope	Nikon	N/A	Nikon OPTIPHOT-2 fluorescence microscope with camera and super high pressure mercury lamp power supply.
pH Meter	Mettler Toledo	51302803	Used to test the pH of the “nanowires” medium after finished and before autoclaving.
PEEK Union	Valco	ZU1TPK	For connecting the inlet and outlet of SALVI, the syringe to the tubing system, and the inlet of the SALVI

			to the drip chamber of the tubing system.
5 Axes Sample Stage	IONTOF	N/A	Stage is self-made for mounting SALVI in ToF-SIMS.
Barnstead Nanopure Water Purification System	Thermo Fisher Scientific	D11921	ROpure LP Reverse Osmosis filtration module (D2716)
Pipette	Thermo Fisher Scientific	21-377-821	Range: 100 to 1,000 μ L.
Pipette Tip	Neptune	2112.96.BS	1,000 μ L pipette tips
Razor Blade Handle	Stanley	N/A	Stanley Bostitch Razor Blade Scraper with 5 Single-Edge Blades, used for cutting PTFE tubing
Syringe	BD	309659	1 mL
Syringe	BD	309657	3 mL
Syringe	BD	309646	5 mL; Used for making the drip chamber
Syringe	BD	309604	10 mL
Syringe	BD	302830	20 mL
Disposable Pipette	Thermo Fisher Scientific	13-678-11	25 mL Fisherbrand™ Sterile Polystyrene Disposable Serological Pipets with Magnifier Stripe, for filling serum bottles.
Electric Pipette Filler	Pipet-aid	P-57260	Vacuum pressure electric serological pipette filler
Serum Bottle	Sigma	33109-U	Holds approximately 69 mL of liquid for culture growth, optimum for use of 20mL culture per bottle.
Anaerobic Culture Tube	VWR	89167-178	Anaerobic Tubes, 18 x 150 mm, Supplied with 20 mm Blue Butyl Rubber Stopper and Aluminum Seal.
Rubber Stopper	Sigma	27235-U	Silicone stopper, used for sealing serum bottles and for creating the tubing system/drip chamber.
Aluminum Crimp Seal (without septum)	Sigma	27227-U	Aluminum seal for top of serum bottle for use with serum bottle crimper.
Serum Bottle Aluminum Seal Crimper	Wheaton	224307	30 mm crimper with standard seal.
PTFE Tubing	Supelco	58697-U	1.58 mm OD x 0.5 mm ID 50 ft. PTFE Teflon tubing, used for creating the tubing system.
Disposable Cuvettes	GMBH	759085D	1.5 MI for use with spectrophotometer.
Needle	BD	303015	22G; used for serum bottle injection.
Needle	BD	305120	23G; used for punching-through rubber stopper to create drip tubing system.
Shewanella oneidensis MR-1 with GFP	N/A	N/A	Matthysse AG, Stretton S, Dandie C, McClure NC, & Goodman AE (1996) Construction of GFP vectors for use in Gram-negative bacteria other than Escherichia coli. FEMS Microbiol Lett 145(1):87-94.
Ethanol	Thermo Fisher Scientific	S25310A	95% Denatured

TSA	BD	212305	Tryptic soy agar for culturing the model organism (<i>S. oneidensis</i>) used in this protocol
PIPES Buffer	Sigma	P-1851	Used for "nanowires" medium {Hill, E.A. 2007}
Sodium Hydroxide	Sigma	S-5881	Used for "nanowires" medium {Hill, E.A. 2007}
Ammonium Chloride	Sigma	A-5666	Used for "nanowires" medium {Hill, E.A. 2007}
Potassium Chloride	Sigma	P-4504	Used for "nanowires" medium {Hill, E.A. 2007}
Sodium Phosphate Monobasic	Sigma	S-9638	Used for "nanowires" medium {Hill, E.A. 2007}
Sodium Chloride	Thermo Fisher Scientific	S271-3	Used for "nanowires" medium, and used to make mineral solution used for "nanowires" medium {Hill, E.A. 2007}
Sodium lactate	Sigma	L-1375	60%(w/w) syrup @ 98% pure, d=1.3 g/mL, 7M, used for "nanowires" medium {Hill, E.A. 2007}
Sodium Bicarbonate	Sigma	S-5761	Used to make ferric NTA solution, used for "nanowires" medium {Hill, E.A. 2007}
Nitrilotriacetic Acid Trisodium Salt	Sigma	N-0253	Used to make ferric NTA solution, used for "nanowires" medium {Hill, E.A. 2007}
Iron (III) Chloride	Sigma	451649	Used to make ferric NTA solution, used for "nanowires" medium {Hill, E.A. 2007}
Magnesium Sulfate	Sigma	208094	Used to make minerals solution, used for "nanowires" medium {Hill, E.A. 2007}
Manganese (II) Sulfate Monohydrate	Sigma	M-7634	Used to make minerals solution, used for "nanowires" medium {Hill, E.A. 2007}
Iron(II) Sulfate Heptahydrate	Sigma	215422	Used to make minerals solution, used for "nanowires" medium {Hill, E.A. 2007}
Calcium Chloride Dihydrate	Sigma	223506	Used to make minerals solution, used for "nanowires" medium {Hill, E.A. 2007}
Cobalt(II) Chloride	Sigma	60818	Used to make minerals solution, used for "nanowires" medium {Hill, E.A. 2007}
Zinc Chloride	Sigma	229997	Used to make minerals solution, used for "nanowires" medium {Hill, E.A. 2007}
Copper(II) Sulfate Pentahydrate	Sigma	C-8027	Used to make minerals solution, used for "nanowires" medium {Hill, E.A. 2007}
Aluminum Potassium Sulfate Dodecahydrate	Sigma	237086	Used to make minerals solution, used for "nanowires" medium {Hill, E.A. 2007}
Boric Acid	Sigma	B-6768	Used to make minerals solution, used for "nanowires" medium {Hill, E.A. 2007}

Sodium Molybdate Dihydrate	Sigma	331058	Used to make minerals solution, used for "nanowires" medium {Hill, E.A. 2007}
Nickel(II) Chloride	Sigma	339350	Used to make minerals solution, used for "nanowires" medium {Hill, E.A. 2007}
Sodium Tungstate Dihydrate	Sigma	14304	Used to make minerals solution, used for "nanowires" medium {Hill, E.A. 2007}
D-Biotin	Sigma	47868	Used to make vitamin solution, used for "nanowires" medium {Hill, E.A. 2007}
Folic Acid	Sigma	F-7876	Used to make vitamin solution, used for "nanowires" medium {Hill, E.A. 2007}
Pyridoxine Hydrochloride	Sigma	P-9755	Used to make vitamin solution, used for "nanowires" medium {Hill, E.A. 2007}
Riboflavin (B2)	Sigma	47861	Used to make vitamin solution, used for "nanowires" medium {Hill, E.A. 2007}
Thiamine Hydrochloride	Sigma	T-4625	Used to make vitamin solution, used for "nanowires" medium {Hill, E.A. 2007}
Nicotinic Acid	Sigma	N4126	Used to make vitamin solution, used for "nanowires" medium {Hill, E.A. 2007}
D-Pantothenic Acid Hemicalcium Salt	Sigma	21210	Used to make vitamin solution, used for "nanowires" medium {Hill, E.A. 2007}
Vitamin B12	Sigma	V-2876	Used to make vitamin solution, used for "nanowires" medium {Hill, E.A. 2007}
4-Aminobenzoic Acid	Sigma	A-9878	Used to make vitamin solution, used for "nanowires" medium {Hill, E.A. 2007}
Thioctic Acid	Sigma	T-1395	Used to make vitamin solution, used for "nanowires" medium {Hill, E.A. 2007}