

Materials List for:

Use of a Battery of Chemical and Ecotoxicological Methods for the Assessment of the Efficacy of Wastewater Treatment Processes to Remove Estrogenic Potency

Nicola Beresford¹, Alice Baynes¹, Rakesh Kanda¹, Matthew R. Mills², Karla Arias-Salazar², Terrence J. Collins², Susan Jobling¹

¹Institute of Environment Health and Societies, Brunel University London

²Department of Chemistry, Carnegie Mellon University

Correspondence to: Rakesh Kanda at Rakesh.Kanda@brunel.ac.uk

URL: <https://www.jove.com/video/54243>

DOI: [doi:10.3791/54243](https://doi.org/10.3791/54243)

Materials

Name	Company	Catalog Number	Comments
Wellwash Versa plate washer	Thermo Scientific	5165010	
Plate reader	Molecular Devices	SpectraMax 340PC	
Incubator	Memmert	INB 400	37 °C incubation required for carp assay
Fisherbrand whirlimixer	Fisher Scientific	13214789	
Icemaker	Scotsman	AF80	
12-Channel F1 digital multichannel pipette	Thermo Scientific Finnpipette	4661070	
ELISA kits	Biosense Laboratories	V01018401-096 (Fathead minnow) V01003402-096 (Carp)	
Microfuge tubes, 0.5 ml	Alpha labs	LW2372	
Microfuge tubes, 1.5 ml	Alpha labs	LW2375	
Sulphuric acid, 95-98%	Sigma-Aldrich	258105	
Histology			
Tissue processor	Leica Biosystems	TP1020	
Wax dispenser	Thermo Scientific Raymond Lamb	E66HC	
Metal embedding mold	Leica Biosystems	Various	
Hot plate	Thermo Scientific Shandon	3120063	
Cold plate (EG1150 C)	Leica Biosystems	14038838037	
Heated forceps (EG F)	Leica Biosystems	14038835824	
Microtome	Leica Biosystems	RM2235	
Paraffin section floatation bath	Electrothermal	MH8517	
Slide drying bench	Electrothermal	MH6616	
Stainmate automated stainer	Thermo Scientific Shandon	E103/S10L	
Cassettes, Histosette II, biopsy	Simport	M493	
Paraffin wax	Thermo Scientific Raymond Lamb	W1	
Histo-Clear II	National Diagnostics	HS-202	
IMS (ethanol mix), IDA99	Tennants	ID440	
Polysine adhesion slides	Thermo Scientific Gerhard Menzel	J2800AMNZ	
Cover slips, 22x50 mm	VWR	631-0137	
Histomount	National Diagnostics	HS-103	
Haematoxylin Harris GURR	VWR	351945S	
Eosin, 1%, aqueous	Pyramid Inovation	S20007-E	

Fisherbrand slide boxes	Fisher Scientific	11701486	
Microtome blades, MB35	Thermo Scientific Shandon	3050835	
Bouin's solution	Sigma Aldrich	HT10132-1L	
Yeast screen			
Flow cabinet	Labcaire Systems Ltd	SC12R	
Cooled incubator	LMS Cooled Incubator	303	
Incubator	Memmert	INB 400	
Shaker	Grant	PSU-10i	
Fisherbrand whirlimixer	Fisher Scientific	13214789	
Plate shaker	Heidolph Titramax 100	544-11200-00	
12-Channel F1 digital multichannel pipette	Thermo Scientific Finnpiquette	4661070	
12-channel pipette, electronic	Sartorius	735441	
96-well flat-bottom microplates	MP Biomedicals Thermo Scientific Nunc Sarstedt	76-232-05 260860 82.1581.001	We have found that these multiwell plates all produce low backgrounds
HPLC grade water	Rathburn	RH1020	
Absolute ethanol	Hayman Kimia	F200238	
Potassium phosphate monobasic anhydrous	Sigma-Aldrich	P-5655	
Ammonium sulphate	Sigma-Aldrich	A-2939	
Potassium hydroxide, pellets	Sigma-Aldrich	P-1767	
Magnesium sulfate, anhydrous	Sigma-Aldrich	M-2643	
Iron(III) sulfate	Sigma-Aldrich	307718	
L-Leucine	Sigma-Aldrich	L-8912	
L-Histidine	Sigma-Aldrich	H-6034	
Adenine	Sigma-Aldrich	A-2786	
L-Arginine, hydrochloride	Sigma-Aldrich	A-6969	
L-Methionine	Sigma-Aldrich	M-5308	
L-Tyrosine	Sigma-Aldrich	T-8566	
L-Isoleucine	Sigma-Aldrich	I-7403	
L-Lysine, hydrochloride	Sigma-Aldrich	L-8662	
L-Phenylalanine	Sigma-Aldrich	P-5482	
L-Glutamic acid	Sigma-Aldrich	G-8415	
L-Valine	Sigma-Aldrich	V-0513	
L-Serine	Sigma-Aldrich	S-4311	
Thiamine, hydrochloride	Sigma-Aldrich	T-1270	
Pyridoxine	Sigma-Aldrich	P-5669	
D-Pantothenic acid, hemicalcium salt	Sigma-Aldrich	P-5155	
Inositol	Sigma-Aldrich	I-5125	
D-Biotin	Sigma-Aldrich	B-4639	
D-(+)-Glucose anhydrous; mixed anomers	Sigma-Aldrich	G-7021	
L-Aspartic acid	Sigma-Aldrich	A-4534	
L-Threonine	Sigma-Aldrich	T-8441	
Copper(II) sulfate, anhydrous	Sigma-Aldrich	C-1297	

Chlorophenolred-β-D galactopyranoside (CPRG)	Sigma-Aldrich	10884308001	
Glycerol	Sigma-Aldrich	G-2025	
17 β-Estradiol	Sigma-Aldrich	E-8875	
Steroids			
Acetone	Rathburn		
Acetonitrile	Rathburn		
Ammonia solution	Rathburn		
Ethylacetate	Rathburn		
Copper(II) nitrate	Sigma-Aldrich		
Acetone	Rathburn		
Dichloromethane	Rathburn		
2,4,16,16-d ₄ -17β-estradiol	CDN Isotopes		
2,4,16,16-d ₄ -estrone	CDN Isotopes		
2,4,16,16-d ₄ -17α-ethynyl oestradiol	CDN Isotopes		
17β-estradiol	Sigma-Aldrich		
Estrone	Sigma-Aldrich		
17α-ethynyl oestradiol	Sigma-Aldrich		
Hexane	Rathburn		
Hydrochloric acid	Sigma-Aldrich		
Methanol	Sigma-Aldrich		
Sodium hydrogen carbonate	Sigma-Aldrich		
Sodium hydroxide	Sigma-Aldrich		
Styrene divinyl benzene cartridge (Isolute ENV+) solid phase extraction cartridge (200 mg/6 ml)	Biotage		
Isolute aminopropyl solid phase extraction cartridge (500 mg/6 ml)	Biotage		
Fish study			
orange-white silicon manifold tubing 0.63 bore pk 6	Watson Marlow	982.0063.000	
straight connectors for 0.5/0.8 bore pk 20	Watson Marlow	999.2008.000	
pumsil silicon tubing 0.8 bore 15 m	Watson Marlow	913.A008.016	
200 series multi-channel peristaltic pump	Watson Marlow	205CA	
Silicone tubing x 15 m (dosing tanks)	VWR	SFM1-3250	
silicone tubing x 15 m (large for inflow/outflow)	VWR	SFM1-5450	
2.5 L glass winchester pk 4	Fisher Scientific	BTF-505-050B	
magnetic stir bar 51 x 8 mm pk 10	Fisher Scientific	FB55595	
Ethyl 3-aminobenzoate methanesulfonate (MS222)	Sigma Aldrich	E10521-10G	
17α-Ethynylestradiol	Sigma Aldrich	E4876-100MG	
Absolute ethanol	Hayman Kimia	F200238	
SPE			
1/8 inch PTFE tubes 'straws' colour coded pk 4	Sigma Aldrich	57276	

disposable liners for manifold	Sigma Aldrich	57059	
filtration tubes without frits 6 ml pk 30	Sigma Aldrich	57242	
reservoir adaptors pk 12	Sigma Aldrich	57020-U	
stainless steel weight for manifold pk 4	Sigma Aldrich	57278	
male Luer plug for manifold pk 12	Sigma Aldrich	504351	
SPE Vacuum Manifold	Sigma Aldrich	57265	
stop cocks for extraction manifold (supelco) pk 12	Waters	WAT054806	
Sep-Pak Plus C18 cartridge box 50	Waters	WAT020515	
Methanol HPLC grade 2.5 L	Fisher Scientific	M/4056/17	
7 ml glass vials with lids (58 x 17 mm) pk 399	Fisher Scientific	TUL-520-031K	
Absolute ethanol	Hayman Kimia	F200238	
vacuum pump, e.g., VP Series Vacuum Pump	Camlab	1136915	