

Materials List for:

Detecting Estrogenic Ligands in Personal Care Products using a Yeast Estrogen Screen Optimized for the Undergraduate Teaching Laboratory

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Materials

Name	Company	Catalog Number	Comments
Equipment			
Vortex Mixer (for single or multiple tubes)	Fisher Scientific (www.fishersci.com)	02-215-365	Any mixer will suffice.
Bucket centrifuge	Fisher Scientific (www.fishersci.com)	75-063-839	Any bucket centrifuge will suffice if it is capable of centrifuging conical tubes at 4000 rpm.
Bunsen burner	Fisher Scientific (www.fishersci.com)	17-012-823	Any Bunsen burner will suffice, or an alcohol burner (Fisher Scientific 04-245-1) can be used instead.
Incubator	Fisher Scientific (www.fishersci.com)	50125590H	Any incubator will suffice if it is capable of maintaining 30 °C.
Microplate reader	BioTek (www.biotek.com)	EPOCH2	A different brand of plate reader will suffice if it can measure absorbance at wavelengths of 405, 574, and 610 nm.
Gen5 microplate reader and imager software	BioTek (www.biotek.com)	GEN5	Software required depends on make and model of plate reader; GEN5 software is intended for use with BioTek plate reader.
Refrigerator	Fisher Scientific (www.fishersci.com)	05LREEFSA	Any refrigerator will suffice if it is capable of maintaining 4 °C.
Pipettor or PipetAid compatible with 1 - 10 mL serological pipets	Fisher Scientific (www.fishersci.com)	13-681-15E	Any pipettors will suffice if they are compatible with 1 & 10 mL serological pipets.
P10 micropipettor	Fisher Scientific (www.fishersci.com)	F144562G	Any micropipettor will suffice if it is capable of dispensing 5 µl.
P200 micropipettor	Fisher Scientific (www.fishersci.com)	F144565G	Any micropipettor will suffice if it is capable of dispensing up to 200 µl.
P300 multichannel pipettor	Fisher Scientific (www.fishersci.com)	FBE1200300	Any multichannel pipettor will suffice if it is capable of dispensing 50 - 205 µl.
Repeating pipettor	Fisher Scientific (www.fishersci.com)	F164001G	Must be able to deliver 100 - 320 µl; this pipettor is optional because a multichannel pipettor can be used instead.
Name	Company	Catalog Number	Comments
Supplies			

Sterile 15 mL conical tubes with caps	Fisher Scientific (www.fishersci.com)	05-539-801	
Glass scintillation vials	Fisher Scientific (www.fishersci.com)	03-337-4	
Polystyrene 96-well, flat-bottom microplates with lid (nonsterile)	Fisher Scientific (www.fishersci.com)	12565501	
Polypropylene 96-well, flat-bottom microplates without lid	Cole-Parmer (www.coleparmer.com)	EW-01728-81	
100 mL glass beakers	Fisher Scientific (www.fishersci.com)	02-539H	Any glass beakers will suffice if they are autoclavable.
250 mL glass Erlenmeyer flasks	Fisher Scientific (www.fishersci.com)	FB500250	Any glass Erlenmeyer flasks will suffice if they are autoclavable.
Sterile, adhesive, porous film	VWR (www.vwr.com)	60941-086	
Metal forceps	Fisher Scientific (www.fishersci.com)	12-000-157	Any metal forceps will suffice.
Reagent reservoir	Fisher Scientific (www.fishersci.com)	07-200-127	
Filtration units (0.2 µm)	Fisher Scientific (www.fishersci.com)	09-761-52	
Squirt bottle (for ethanol)	Fisher Scientific (www.fishersci.com)	02-897-10	Any laboratory squirt bottles will suffice.
Autoclavable storage bottles	Fisher Scientific (www.fishersci.com)	06-414-1D	Any autoclavable glass storage bottles will suffice.
10 mL glass serological pipets (sterile)	Fisher Scientific (www.fishersci.com)	13-678-27F	Any glass serological pipets will suffice.
1 mL glass serological pipets (sterile)	Fisher Scientific (www.fishersci.com)	13-678-27C	Any glass serological pipets will suffice.
P10 micropipettor tips	USA Scientific (www.usascientific.com)	1120-3810	Any tips will suffice if they are compatible with the micropipettor above.
P200 micropipettor tips	USA Scientific (www.usascientific.com)	1120-8810	Any tips will suffice if they are compatible with the micropipettor above.
P300 micropipettor tips	USA Scientific (www.usascientific.com)	1120-9810	Any tips will suffice if they are compatible with the micropipettor above.
Syringe tips for repeating pipettor	Fisher Scientific (www.fishersci.com)	F164150G	Only required if a repeating pipettor is used.
Sterile petri dishes	Fisher Scientific (www.fishersci.com)	FB0875712	Any sterile petri dishes will suffice.
Parafilm	Fisher Scientific (www.fishersci.com)	S37440	
Name	Company	Catalog Number	Comments
Yeast			
<i>Saccharomyces cerevisiae</i> strains that lack the TRP1 gene product (e.g., W303a)	American Type Culture Company (ATCC) (www.ATCC.org)	MYA-151	Recombinant yeast are also available upon request from the authors.
Receptor/reporter plasmid for ERα	Addgene (www.addgene.org)	pRR-ERalpha-5Z (Plasmid #23061)	
Receptor/reporter plasmid for ERβ	Addgene (www.addgene.org)	pRR-ERbeta-5Z (Plasmid #23062)	
Name	Company	Catalog Number	Comments
Chemicals			
Difco agar	BD (www.bd.com)	214530	
Dithiothreitol	Sigma (www.sigmaldrich.com)	D0632	CAUTION: Dithiothreitol is an acute skin and eye irritant. Use

			appropriate personal protection equipment (gloves, fume hood, dust mask) to avoid skin and eye contact, inhalation and ingestion.
Ortho-nitrophenyl-β-D-galactopyranoside	Sigma (www.sigmaaldrich.com)	N1127	
Chlorophenol red-β-D-galactopyranoside	Sigma (www.sigmaaldrich.com)	10884308001	
Yeast nitrogen base	Sigma (www.sigmaaldrich.com)	Y0626	
Glucose	Sigma (www.sigmaaldrich.com)	G8270	
Galactose	Sigma (www.sigmaaldrich.com)	G5388	
Adenine sulfate	Sigma (www.sigmaaldrich.com)	A9126	
Uracil	Sigma (www.sigmaaldrich.com)	U0750	
Leucine	Sigma (www.sigmaaldrich.com)	L8000	
Histidine	Sigma (www.sigmaaldrich.com)	H8000	
17 β-Estradiol	Sigma (www.sigmaaldrich.com) MP Biomedicals	E8875-250 mg 0219456401 - 1 mg	CAUTION: Estradiol is a suspected carcinogen and reproductive toxicant. It is harmful if inhaled, swallowed, or absorbed through skin. Estradiol may cause harm to breast-fed children and fetuses. Estradiol is very toxic to aquatic life. Use appropriate personal protection (gloves, fume hood, dust mask) and avoid exposure during pregnancy and lactation. Estradiol should be disposed of as hazardous waste and not released to the environment.
100% ethanol	Pharmco-Aaper (www.pharmcoaaper.com)	111000200	
Sodium phosphate monobasic monohydrate	Sigma (www.sigmaaldrich.com)	S9638	
Sodium phosphate dibasic (anhydrous)	Sigma (www.sigmaaldrich.com)	S0876	
Magnesium chloride	Sigma (www.sigmaaldrich.com)	M8266	
Potassium chloride	Sigma (www.sigmaaldrich.com)	P9333	
Sarkosyl (N-lauroylsarcosine sodium salt)	Sigma (www.sigmaaldrich.com)	L5125	
Sodium carbonate	Sigma (www.sigmaaldrich.com)	S7795	
Name	Company	Catalog Number	Comments
Software			
Excel spreadsheet software	Microsoft		Excel is convenient spreadsheet software for managing data outputs and generating .csv files for R analysis.
Java software (required for Appendix 1 application)	Oracle Corporation		To calculate LacZ values using the application in Appendix 1, first download free Java software (https://www.java.com/en/download/), then open the LacZ application in Appendix 1. LacZ results created by the application can be copied by pressing "control (ctrl) + c" on PC keyboards, or "command + c" on Mac keyboards.

<p>JMP statistical software version 13.0.0</p>	<p>SAS Institute</p>		<p>Appendix 2 includes directions on using JMP to fit LacZ data to a four-parameter logistic regression curve. The curve is used to interpolate test sample estradiol equivalents (EEQs), relative to the estradiol standard curve.</p>
<p>R statistical computing and graphics software</p>	<p>R Foundation</p>		<p>Free R software can be downloaded from https://www.r-project.org/. Directions and code for using R to fit LacZ data to a four-parameter logistic regression curve are given in Appendix 2.</p>