

Materials List for:

High-resolution Patterned Biofilm Deposition Using pDawn-Ag43

Xiaofan Jin¹, Ingmar H. Riedel-Kruse¹

¹Department of Bioengineering, Stanford University

Correspondence to: Ingmar H. Riedel-Kruse at ingmar@stanford.edu

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Materials

Name	Company	Catalog Number	Comments
DH5alpha/pDawn-Ag43	Addgene	107742	DH5alpha cloning strain hosting pDawn-Ag43 plasmid - plasmid needs to be moved to E. coli strain of interest prior to use
MG1655 E. coli	Coli Genetic Stock Center - Yale University	CGSC #6300	MG1655 was used as E. coli strain of interest in this paper's representative results
RFP expression plasmid	iGEM biobricks	J04450-pSB4K5bb	Many options exist to obtain fluorescent bacteria - if using plasmid, ensure backbone does not conflict with colE1 ori of pDawn-Ag43
Plasmid miniprep kit	Qiagen	27104	
LB broth powder	Affymetrix	75852	Add 20 g/L to water, autoclave, add 50 µg/mL spectinomycin to get sterile LB+spec
LB agar powder	Affymetrix	75851	Add 35 g/L to water, autoclave, add 50 µg/mL spectinomycin, pour into petri dishes to get sterile LB+spec plates
Petri dishes	Fisherbrand	431760	
Spectinomycin hydrochloride pentahydrate	abcam	ab141968	Make 1000x stock 50mg/mL in water, filter sterilize and dilute into media as needed
Glycerol	Sigma-Aldrich	G5516	Mix at 1:1 ratio with water, sterilize by autoclave or filter to obtain 50% glycerol
M63 media salts 5X solution	Bio-world	705729	Add cas-amino acids, glucose and MgSO ₄ , bring to 1X salts concentration by adding sterile water
Casamino acids	Amresco	J851	Make 20% stock in water, filter sterilize and add to M63 as supplement (final concentration 0.1%)
D-glucose	Sigma-Aldrich	G8270	Make 20% stock in water, filter sterilize and add to M63 as supplement (final concentration 0.2%)
Magnesium sulfate	Sigma-Aldrich	M7506	Make 1 M stock in water, autoclave and add to M63 as supplement (final concentration 1 mM)
Crystal violet	Acros organics	212120250	Dilute to 0.1% in water prior to use
Self-hardening mounting media (Shandon immumount)	Thermo Scientific	9990402	Use to preserve samples over long term for fluorescence imaging

Phosphate buffered saline (PBS) solution	Gibco	10010023	Can also use PBS prepared from powder / tablets
6 well plate	Fisherbrand	351146	Used as biofilm culture dish for representative results
PDMS kit	Dow	SYLGARD 184	Can be used to make enclosed microchamber cavities using soft lithography
1 mL syringe	BD syringe	309659	For use with liquid handling with enclosed microchambers
Blunt tip needle	CML supply	901-23-050	Attaches to 1 mL syringe
Lab tape	Fisherbrand	15-901	Use to attach culture chamber to incubator ceiling
Bacterial incubator	Sheldon Manufacturing	SMI6	Ensure interior height of incubator is tall enough to focus projector at the ceiling
Portable projector	Ivation	IV-PJ-PRO-4-1	Many portable projector models exist, pDawn-Ag43 has been tested with multiple models including LED/laser based, with blue light channel ranging from 450-460nm central wavelength
Optical breadboard base	ThorLabs	MSB6	Base for optical setup to hold projector - many other setups possible, just need to hold projector firmly at bottom of incubator, pointing upwards
Optical post	ThorLabs	TR8	2 posts needed - one to be set up vertically extending out of breadboard base, one horizontally attached via right-angle clamp
Optical post right-angle clamp	ThorLabs	RA90	Connects vertical and horizontal posts
Mounting base	ThorLabs	BA1S	Connects optical breadboard base and vertical post
1/4"-20 screw	ThorLabs	SH25S050	Attaches vertical post to mounting base, mounting base to breadboard base
1/4"-20 set-screw	ThorLabs	SS25E63D	Connects horizontal post to projector via tripod screw-hole
Optical power meter	Newport	840	Use with power meter detector to measure projector illumination intensity - many power meter models exist, using one that has extendable detector will facilitate measurement
Optical power meter detector	Newport	818-UV	Connects to power meter (above) - UV detector not strictly necessary as blue light is within visible range
Adjustable ND filter	K&F Concept	SKU0689	Adjustable (by rotating) neutral density filter - place above projector aperture
Presentation-projector software	Microsoft	Powerpoint	Any software that allows drawing / presentation will suffice
CAD software	Autodesk	AutoCAD	Used for designing photomasks, many mask printing services are compatible with AutoCAD files
Film photomask	Fineline Imaging	n/a	Many photomask printer services exist for high resolution

		(>30000DPI) film photomask printing
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