iGEM2016 – Microbiology – BMB – SDU

Project type: Plastic **Project title:** From bacteria to a 3D printed product **Sub project:** 1. extraction 2. make PHB filaments 3. 3D printing with PHB	**Creation date:** 2016.10.19 **Written by:** Jakob Rønning **Performed by:** Joel Mario Vej-Nielsen & Jakob Rønning

1. SOPs in use.

SOP0031_v1 – TB media
SOP0001_v1 - ON culure of *E. coli*
SOP0044_v1 – Hypochlorite PHB recovery
Manual for Filastruder
http://www.hyrel3d.com/

2. Purpose.

To create a model(jawstump) for an implant with PHB.

3. Overview.

Day	SOPs	Experiments
1	SOP0031	TB media
2	SOP0001	ON culture
2	SOP0044	Extracting with hypochlorite
3	Manual for filastruder	Made PHB filament with ready for 3D printing.
4	HYREL SYSTEM 30M	3D print an implant with PHB.

4. Materials required.

Materials in use

Name	Components (Concentrations)	Manufacturer / Cat. #	Room	Safety considerations
Appropriate medium ex. LB	1% Tryptone 1% NaCl 0.5% Yeast extract	Oxoid Sigma-Aldrich Merck	Media lab or V18-405-0	
Appropriate antibiotic if needed	5 ml graduated pipettes	Fisher Scientific / CCI 4487	Micro storage	
Cuvettes	Contact lab-manager	BMB storage		
Blue pipette tips	Contact lab-manager	Micro storage		
Green pipette tips	Contact lab-manager	Micro storage		
Plate Bag	Contact lab-manager			
Distilled water				
Tryptone		Sigma	Chemical room	
Yeast extract		Sigma	Chemical room	
Glycerol			Chemical room	
1L media bottle			Micro storage	
10 x TB phosphate	2.31 g KH_2PO_4 and 12.54 g K_2HPO_4 in 90 ml H2O, adjust to 100 ml with H2O.		Chemical room	
Sodium hypochlorite	6-14%	sigma	Micro storage	
Ethanol	70 %			
Filastruder				
Hyrel System 30M				

5. Other

Hyrel System 30M was handled by Martin Bonde

6. Experiment history.

Date (YY.MM.DD)	SOPs	Alterations to SOPs and remarks to experiments
16.10.12	SOP0031_v1	Creating 25 L of TB media.
16.10.12	SOP0001_v1	Adds K2018050 to the 5mL ON culture, next day the ON cultures were added to 2L flask to incubate for 72h
16.10.16	SOP0043	Extracts the 25 L of TB media with hypochlorite.
16.10.17	Manuel for filastruder	After the PHB had dried. The dried mass was added to the filastruder. We made 3 meters of filament of PHB that almost had a constant diameter.
16.10.18	HYREL SYSTEM 30M	The 3D print were done in several attempts because the filaments of PHB were not constant in diameter. In the last try the machine managed to make a nice model of the implant (jawstump).

7. Sample specification.

Sample name	Sample content	From	Used for / Saved where

8. Remarks on setup.

9. Results and conclusions.

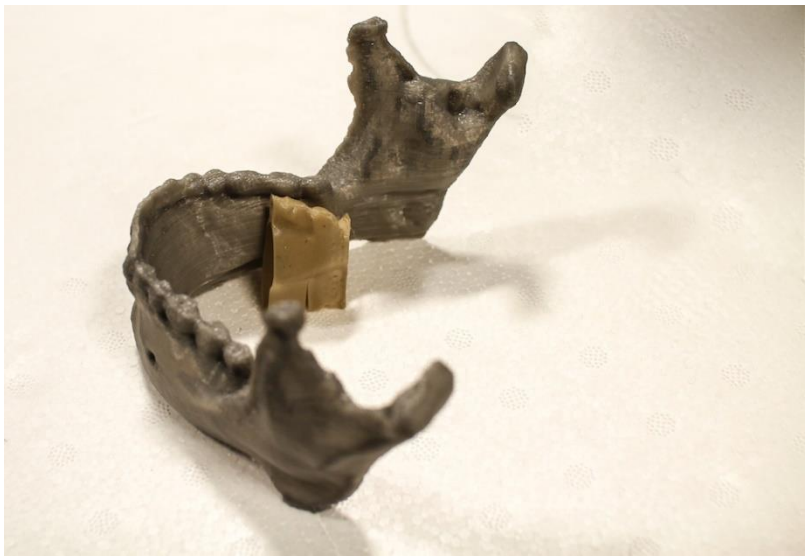

Figure 1: This is a Jaw printed in PLA and a jawstump made of PHB

Figure 2: This is the jawstump made of PHB.

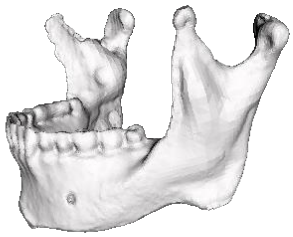

Figure 3: 3D scanning of a jaw.

Figure 4: 3D scanning of a jawstump.

10. Appendixes