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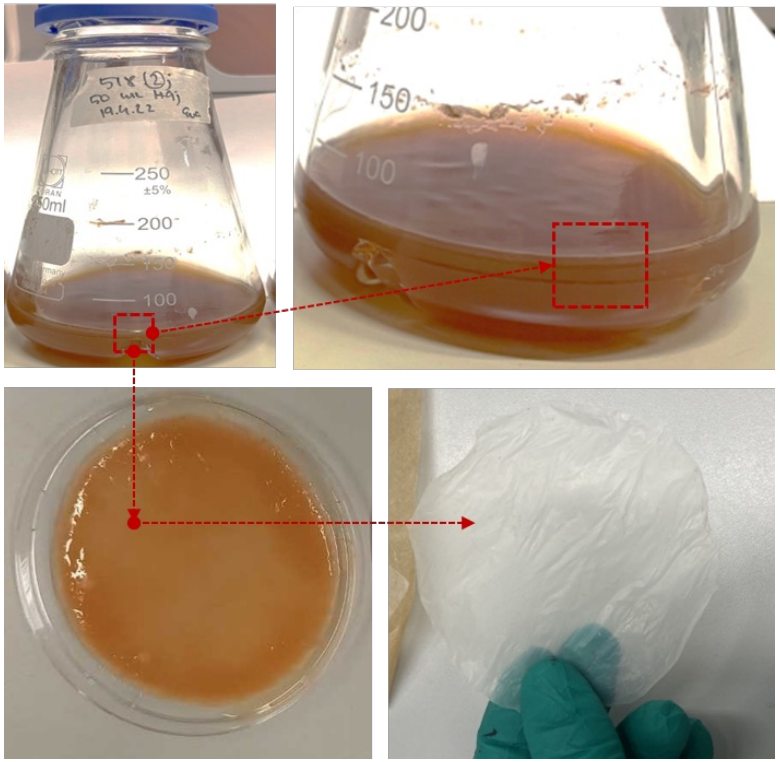
PATENT NAME: FUTUREcell

„Food-waste bacterial culture medium for cellulose production“



INVENTORS (TEAM):

Assis. Prof. Dr. Selestina Gorgieva

- Material scientist, holding expertise in processing and characterisation of bio-based membranes and 3D porous matrices.
- Visiting researcher at **University College of Dublin** and **University in Turin**.

Prof. Dr. Janja Trček

- Microbiologist, specialized in taxonomy, physiology, and applied genetics of acetic acid bacteria.
- With many years of experience working abroad (**ETH Zurich, LMU Munich**) in fields of applied microbiology.

PROBLEM/OPPORTUNITY:

- Culture media is **costly.** It creates cost because of extra production time, extra materials and energy.
  - *The price of the bacterial cellulose depends on the price of the culture medium making 30% of the bacterial cellulose price.*
- Existing culture media are **not produced by green** and sustainable processes.
- They are **not suitable for circular economy**.
- Bacterial cellulose production is not currently available in Slovenia.

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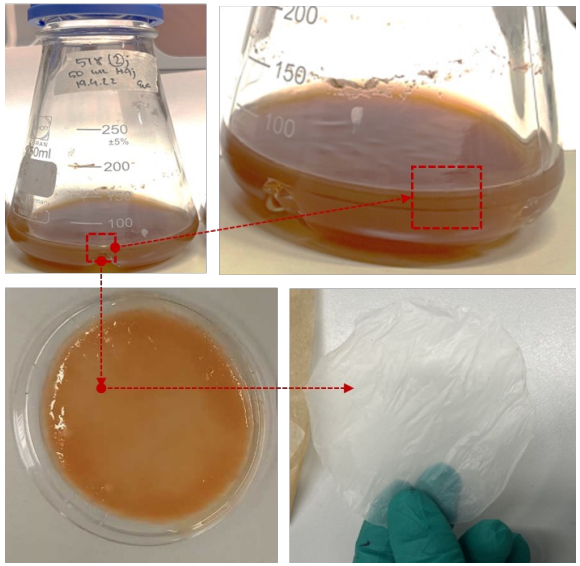
YOUR SOLUTION:

- **We developed cost efficient green technology for preparing food waste-originated bacterial culture medium that is applicable in cellulose production.**
  - *We reduced the cost of cellulose production by reducing the expenses for culture medium.*
  - *Our technology utilizes mechanical and physic-chemical processing of food waste into a medium for bacterial growth and cellulose production.*
  - *Culture medium: naturally complex, no need for purification, absence of inhibitory components for bacterial growth and cellulose production.*



TECHNOLOGY

READINESS LEVEL (TRL 5)

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VALUE PROPOSITION:

15 % cheaper

- use of food waste as a raw material is reducing the cost of culture medium and price of produced bacterial cellulose

Sustainable

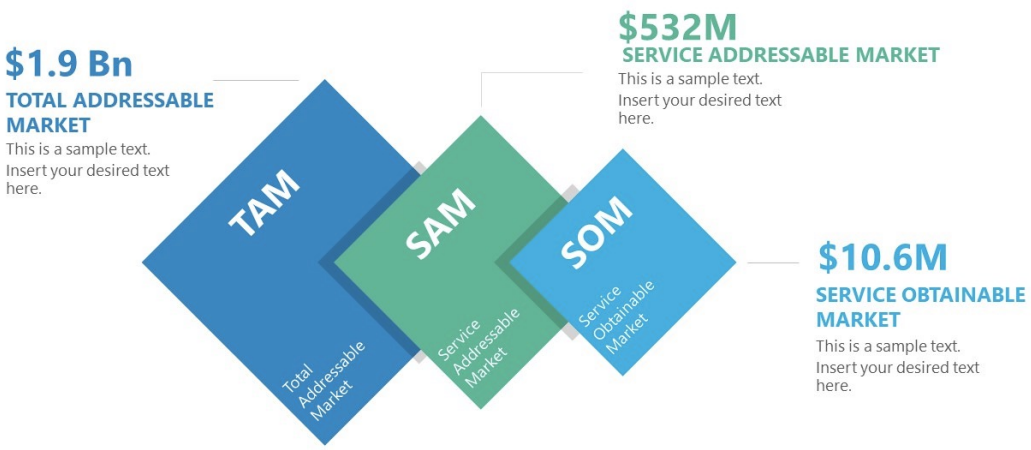
- food waste is not exhaustible raw material and is readily available every autumn season

Simple production procedure

- use of not demanding equipment for mechanical and physic-chemical processing

TARGETED CUSTOMER/USER SEGMENT:

- Segmented target customers – Priority 1: **Companies which are producing bacterial cellulose for biomedical applications**
- Segmented target customers – Priority 2: **Companies which are producing bacterial culture media.**



MARKET SIZE/GROWTH:

Nanocellulose Market: Revenue in USD million, by Product Type, Global, 2016-2024

Product Type	2016	2017	2018	2019 (est.)	2024 (f)	% CAGR (2019-2024)
Nanofibrillated Cellulose (NFC)	179.80	214.86	256.25	303.70	609.48	**14.95%**
Nanocrystalline Cellulose (NCC)	91.60	107.65	127.01	150.11	322.42	**16.52%**
Bacterial Cellulose (BC)	33.93	42.86	56.63	77.19	379.52	**37.51%**
Microfibrillated Cellulose (MFC)	28.16	33.20	39.89	48.67	134.37	**22.52%**
Other Product Types	5.77	6.84	8.12	9.66	24.35	**20.30%**
Total	**339.25**	**405.40**	**487.90**	**589.34**	**1470.13**	**20.06%**

Nanocellulose Market: Revenue in USD million, by End User, Global, 2016-2024

End User	2016	2017	2018	2019 (est.)	2024 (f)	% CAGR (2019-2024)
Paper Processing	84.81	98.53	115.11	134.93	292.56	**16.74%**
Paints and Coatings	30.53	35.76	42.07	49.68	113.80	**18.03%**
Oil and Gas	16.96	20.21	24.22	29.18	75.93	**21.08%**
Food and Beverage	23.75	28.49	34.43	41.94	111.74	**21.65%**
Composites	108.56	132.63	163.27	200.97	521.70	**21.02%**
Pharmaceuticals and Cosmetics	40.71	49.38	60.54	74.83	210.23	**22.95%**
Other End Users	33.93	40.41	48.26	57.81	144.16	**20.05%**
Total	**339.25**	**405.40**	**487.90**	**589.34**	1470.13	**20.06%**

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COMPETITORS:

Our invention

Culture Medium	Sigma	Graso Biotech	Celotech	Invention
Cost-effective	NO	NO	NO	YES
Sustainability	NO	NO	NO	YES
Green Technology	NO	NO	NO	YES

Our invention

Bacterial Cellulose	Nerd Skin Care	Bowil	Celluforce	Invention
Cost-effective	NO	NO	NO	YES
Sustainability	NO	NO	NO	YES
Green Technology	NO	NO	NO	YES

DEVELOPMENT NEEDS/ROAD MAP:

Technology is validated in lab
April 2022

Pilot-scale production
September 2022 -

Technology validation in production
September 2022 - November 2022

Product Launch
2023

COMMERCIALIZATION MODEL

- Patent Licensing
  - *Exclusive/non-exclusive*
- Co-development to increase TRL

PATENT SCORE:

VALIDATE Phase	
MARKET	79
TECHNOLOGY	61
TEAM	59
PATENT SCORE	199
PATENT SCORE %	81%

PATENT SCORE			
Investment Level	EXPLORE Phase	VALIDATE Phase	LAUNCH Phase
High Potential	>150	>180	>220
Medium Potential	120-150	150-180	180-220
Low Potential	<120	<150	<180

PATENT SCORE %			
Investment Level	EXPLORE Phase	VALIDATE Phase	LAUNCH Phase
High Potential	>%60	>%70	>%85
Medium Potential	%45-60	%60-70	%70-85
Low Potential	<%45	<%60	<%70

High Potential for Licensing