

Technology offer

Modification of bacterial cellulose with micro-structured gelatin coating

Field of use

Medicine, stomatology,
pharmacy

Current state of technology

TRL7

Patent status

Patent pending

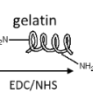
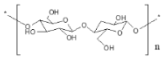
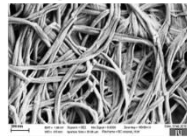
Developed by

Selestina Gorgieva
Alenka Ojsteršek

Contact details

University of Maribor
Knowledge and technology
transfer office
Telefon: +386 2 23 55 298
E-mail: tto@um.si

SEM image: bacterial cellulose



SEM image: bacterial cellulose - gelatin

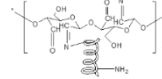
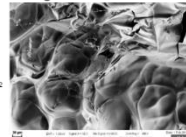


Photo: bacterial cellulose - gelatin membrane



Background

Bacterial cellulose is nanofibrillar material with high purity, flexibility, strength and biocompatibility. As such is attractive material for application in medicine. Yet, it missing the cell-interactive moieties, and as such is relatively non bioactive. This limits its wider applicability in advanced medical products.

Description of the invention

The researchers develop simple procedure for modification of bacterial cellulose with micro structured gelatin coating. New technology includes preparation of microstructured gelatin coating onto bacterial cellulose membrane. It is post-synthetic modification of bacterial cellulose. Procedure involves: i) pouring the gelatin-water solution containing carbodiimide cross-linkers (EDC/NHS) onto the bacterial cellulose, ii) immediate freezing onto freezing plate, iii) slow thawing (within fridge, 8°C), and iii) final washing. Resulting membranes (photo) are highly flexible, and both layers are tightly integrated.

Main advantages

Bilayer composite, composed of highly integrated, non porous bacterial cellulose and highly porous gelatin is applicable for guided tissue regeneration. In this application, the non porous part restrict proliferation on one cell type, while the porous part allow proliferation of another cells type. Additionally, the porous part is made of collagen derivative- gelatin, which is natural environment for most of human cells. Membrane is not cytotoxic, do not effect on cells membrane integrity, improve the viability and provide barrier function in contact with fibroblast cells (in vitro).