

## Accepted Manuscript

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Authors: Moumita Khamrai, Sovan Lal Banerjee, Patit P. Kundu



PII: S0144-8617(17)30731-2  
DOI: <http://dx.doi.org/doi:10.1016/j.carbpol.2017.06.094>  
Reference: CARP 12482

To appear in:

Received date: 3-3-2017  
Revised date: 5-6-2017  
Accepted date: 22-6-2017

Please cite this article as: Khamrai, Moumita., Banerjee, Sovan Lal., & Kundu, Patit P., Modified bacterial cellulose based self-healable polyelectrolyte film for wound dressing application. *Carbohydrate Polymers* <http://dx.doi.org/10.1016/j.carbpol.2017.06.094>

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## Modified bacterial cellulose based self-healable polyelectrolyte film for wound dressing application

Moumita Khamrai<sup>a</sup>, Sovan Lal Banerjee<sup>a</sup>, Patit P. Kundu<sup>a,b\*</sup>

<sup>a</sup>Advanced Polymer Laboratory, Department of Polymer Science & Technology,  
92 A. P. C. Road, University of Calcutta, Kolkata-700009

<sup>b</sup>Department of Chemical Engineering, Indian Institute of Technology (IIT)  
Roorkee, Uttarakhand, India.

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### Highlights:

- Synthesis of bacterial cellulose using *Glucanoacetobacter xylinus* (MTCC7795).
- Anionic modification of bacterial cellulose using poly(acrylic acid).
- Synthesis of ionically interlocked polyelectrolyte film.
- Evaluation of curcumin loading efficiency of the polyelectrolyte film.
- Evaluation of wound healing capability of the drug loaded film.

### Abstract:

In this investigation, we prepare a self-healable polyelectrolyte film via crosslinking the cationically charged chitosan (Cts) with anionically modified bacterial cellulose (BC), which is a green source of nano-filler. This polyelectrolyte film is able to show dynamic self-healing activity at physiological pH condition via adapting ionic interaction, a state of non-covalent bond. BC was prepared using *Glucanoacetobacter xylinus* (MTCC7795) bacteria and after that its surface was modified with anionic poly(acrylic acid) using “grafting from” technique. It was observed that the notch (single and multiple) created over the composite film was disappeared by showing vibrant diffusion and ionic interlocking in contact with buffer solution having physiological pH. The XTT assay revealed that the composite film is non-toxic in nature and it was witnessed that the

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