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## Green Approach for one-pot Synthesis of Silver Nanorod using Cellulose Nanocrystal and their Cytotoxicity and Antibacterial assessment

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### Highlights

- Fast and green synthesis of Ag nanorods in powder form through by novel approach.
- Using of cellulose nanocrystals as a mediator for synthesis of Ag nanorods.
- Investigating their antibacterial activity toward prokaryotic cells.
- Assessment the cytotoxicity of Ag nanorods towards eukaryotic cells.

### Abstract

Herein, this research addresses an innovative approach for one-pot synthesis of highly stabilized silver nanorods in powder form at concentration as high as feasible to be proposed in large-scale production via cellulose nanocrystals (CNC). For the first time, CNC without any surface modification in the presence of alkali is acting as both reducing and stabilizing agent for assembling of Ag nanorods. Extraction of CNC from cotton is carried out as per to acid hydrolysis technique. Thorough assessments of Ag nanorods formation, structural and morphological

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