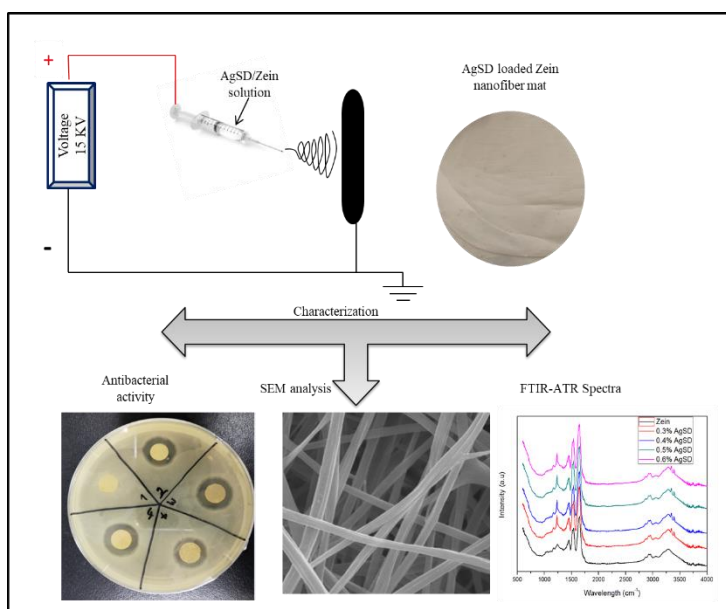


## Silver sulfadiazine loaded Zein nanofiber mats as novel wound dressing

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### Abstract

In this report a novel antibacterial wound dressing was prepared and then characterized for required testing. We loaded Silver sulfadiazine (AgSD) for the first time on electrospinning. AgSD was added in zein (0.3%, 0.4%, 0.5%, and 0.6% by weight) and was electrospun to fabricate nanofiber mats for wound dressing. Nanofiber mats were characterized by Fourier transform infrared spectroscopy (FTIR) to check if there was any chemical reaction between AgSD and zein. Morphological properties were analyzed by Scanning Electron Microscope (SEM), which showed uniform nanofibers without any bead formation. Diameter of nanofibers was gradually decreased with increasing amount of AgSD, which can be associated with strong physical bonding between zein and AgSD. Thermal properties of nanofiber mats were analyzed by Thermogravimetric Analyzer (TGA). X-Ray Diffraction (XRD) further declared crystalline structure of nanofiber mats, and X-Ray Photo spectroscopy (XPS) was performed to confirm Ag and S contents in prepared wound dressing. In order to investigate antibacterial properties, disc diffusion method was carried out. *Bacillus* and *E-Coli* bacteria strains were used as gram-positive and gram-negative respectively. The antibacterial effectiveness of AgSD released from zein nanofibers was determined from the zone inhibition of the bacteria. The antibacterial activity of zein nanofibers loaded by drug observed with both strains of bacteria in comparison to control. Excellent antibacterial efficacy was attributed to sample with 0.6% AgSD. Excellent release properties were also associated with sample with 0.6% AgSD in zein nanofibers. Keeping in view above mentioned characteristics, prepared nanofiber mats would be effective for the application of wound dressing.



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