



Preparation and Characterization of Collagen /Alginate Biocomposite Functionalized with Graphene Oxide for Wound Healing Applications

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Abstract : The present work aims at fabricating a novel scaffold consisting of Collagen/Alginate/Graphene oxide as a biomaterial to be used in wound healing. Collagen was extracted from Chrome Leather Wastes (CLW) and is used in wound dressings because of its properties like biodegradability, biocompatibility, nontoxicity, ability to absorb large amounts of exudates, etc. Alginate, a naturally occurring biopolymer is used in addition to collagen because of its excellent biocompatible, biodegradable, cell affinity, gelling, non-antigenic, chelating ability, immobilization of specific ligands, physical and chemical cross-linking properties. Graphene oxide, synthesized by modified method is used to prepare the biocomposite for its high mechanical strength. The surface morphology was studied using SEM showed sponge-like appearance indicating the presence of collagen, alginate, and graphene oxide. FTIR and FTRAMAN were employed to characterize the scaffold. TGA proved that the scaffold was stable at high temperature. Other physicochemical characterizations like antibacterial activity and water absorption capacity were carried out to study the effect of graphene oxide in combination with collagen and alginate. Since, collagen and alginate are used as separate biomaterials for wound dressing showed good results, a combination of both incorporated with GO was checked for results and it showed a great improvement in all the properties.

Keywords : Wound healing, collagen, alginate, graphene oxide, biocomposite, TGA.