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Synthesis And Characterization of Naturally Derived Sio₂ and Cao for 45S5 Bioactive Glass as An Application in Wound Healing

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he management of skin damage is assumed an unmet clinical need, and no entirely satisfactory solution to this problem exists to date. Bioactive glass (BG) has long been studied in mineralized tissue regeneration, but its potential applications in soft tissue repair, particularly wound healing, have recently shown great promise. Ordinary bio glass like the silicate-based BG 45S5 has been implicated in the stages of wound healing. Herein we prepare the naturally derived biomaterials by using beach sand as a source of high purity silica and eggshell biowaste as a source of calcium to prepare 45S5 BG using the sol-gel method. X-ray diffraction, field emission scanning electron microscopy, Fourier transform infrared spectroscopy, and Raman spectroscopy was used to determine crystal structure, particle morphology, and the presence of chemical functional groups in the synthesized

materials. The biomimetic mineralization of the scaffolds is carried out using stimulated body fluid that mimics the inorganic composition of human blood plasma, and the hydroxyapatite nucleation on the scaffold is confirmed. The highly vascularized chicken chorioallantois membrane (CAM), which surrounds the embryo, can be used to visually examine the angiogenic effect of therapeutics applied to the ex-ovo chicken embryo. These findings indicated that bioactive glass derived from natural sources could improve biological properties for wound healing applications.

Speaker Biography

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