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Modulation of Conductivity of Alginate Hydrogels Containing Reduced Graphene Oxide through the Addition of Proteins

Ahmed Raslan

Universidad Del País Vasco, Spain

Modifying hydrogels in order to enhance their conductivity is an exciting field with applications in cardio and neuro-regenerative medicine. Therefore, we have designed hybrid alginate hydrogels containing uncoated and protein-coated reduced graphene oxide (rGO). We specifically studied the adsorption of three different proteins, BSA, elastin, and collagen, and the outcomes when these protein-coated rGO nanocomposites are embedded within the hydrogels. Our results demonstrate that BSA, elastin, and collagen are adsorbed onto the rGO surface, through a non-spontaneous phenomenon that fits Langmuir and pseudo-second-order adsorption models. Protein-coated rGOs are able

to preclude further adsorption of erythropoietin, but not insulin. Collagen showed better adsorption capacity than BSA and elastin due to its hydrophobic nature, although requiring more energy. Moreover, collagen-coated rGO hybrid alginate hydrogels showed an enhancement in conductivity, showing that it could be a promising conductive scaffold for regenerative medicine

Speaker Biography

Ahmed Raslan is an Assay Development Scientist. He Pursued his PhD. in Universidad Del País Vasco, Spain.

e: drrayad@gmail.com

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