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Biomaterials as targeted tool for medical applications

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Over the past decades, biomaterials play an important role in the field of medicine and health care. The use of synthetic biomaterials has extensive progress due to chronic diseases, malfunction, traumatic accidents and surgical reconstruction. Many research works have been focused on biomaterials in the field of tissue engineering, drug delivery besides imaging as a diagnostic tool. Targeted delivery of drug incorporated nanoparticles as well as 3D scaffolds will enhance the efficacy of the anticancer or other organ-targeted drugs but also reduce the unwanted toxicity of the drug. Our team developed some promising nanobiomaterials and nanohybrids for the improvement of physical, mechanical and cell-biomaterial interactions beside controlling the targeting drug release. Different techniques have been used to prepare nanobiomaterials that help in improving the human life. New formula

incorporated these nanoparticles with an antiinflammatory drug is used for the nonsurgical treatment of preapical lesion arising trauma or bacterial infection as an innovative tool. Kinetic approach has been used to assess the in vitro bioactivity of different nanocomposites formulae used in bone regeneration. Other work aimed to the use of cationic bPEI capped AuNPs for intracellular siRNA delivery that targeted c-Myc gene in human hepatocellular carcinoma cells. Material for imaging such as quantum dots stabilized with magnetic nanoparticles or carbon dots are also beneficial. A multidisciplinary team has been involved in these work activities. Herein, I will present and discuss different laboratory's research advancement for medical applications.

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