

Bioactive biomaterials using drugs and cells

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In the authors' laboratory, various approaches to improved biocompatibility of bioactive materials have been studied. In this paper, synthetic polymers and biological tissues having heparin (Hep) or L-arginine (Arg) will be discussed in detail. These synthetic polymers and heparin or L-arginine containing materials have provided for interesting bioactive interactions with blood, cell, and tissue.

As synthetic materials, a novel Hep-conjugated biodegradable polymer [polylactide (PLA)-Hep] and a novel injectable thermosensitive polymer [copolymer of chitosan and N-isopropylacrylamide (NIPAAm)] were prepared as candidates for blood/tissue compatible material and drug carrier. In addition, as biological tissues having bioactive agents, cellular/acellular matrices (BP/ABP) of bovine pericardium (BP) were chemically modified by the direct coupling of Arg or Hep after glutaraldehyde (GA) cross-linking. The biocompatibility of these synthetic polymers and modified biological tissues was evaluated *in vitro* and *in vivo*.