Drug-eluting stent coatings

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Abstract

This paper reviews the development of coronary stents from a polymer scientist's view point, and presents the first results of an interdisciplinary team assembled for the development of new stent systems. Poly(styrene-b-isobutylene-b-styrene) block copolymer (SIBS), a nanostructured thermoplastic elastomer, is used in clinical practice as the drug-eluting polymeric coating on the Taxus coronary stent (trademark of Boston Scientific Co.). Our group has been developing new architectures comprising of arborescent (dendritic) polyisobutylene cores (D_SIBS), which were shown to be as biocompatible as SIBS. ElectroNanospray (Nanocopoeia Inc.™) was used to coat test coupons and coronary stents with selected D_SIBS polymers loaded with dexamethasone, a model drug. The surface topology varied from smooth to nanosized particulate coating. This paper will demonstrate how drug release pro?les were in?uenced by both the molecular weight of the polyisobutylene core and spraying conditions of the polymer-drug mixture.