Columns for Gel Permeation Chromatography (GPC) System and Related Items

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Farnesylthiosalicylate (FTS, Salirasib) is a new specific nontoxic drug with a mild hydrophobic nature, which acts as a Ras antagonist. Thus, the incorporation of this new drug in a stent coating may overcome the incomplete healing and lack of endothelial coverage associated with current drug-eluting stents. In the current study we developed and studied FTS-loaded bioresorbable shell structures in order to investigate the FTS release profile from a platform that can be used as a stent coating. These structures were composed of a polyglyconate core and a porous PDLGA shell loaded with the antiproliferative agent FTS, prepared using freeze drying of inverted emulsions. In addition to the usage of the coating, the whole unique core/shell fiber platform can be used as basic elements of bioresorbable vascular stents as well as for local treatment of cancer. Our study focused on the effects of the emulsion's composition (formulation) and process kinetics on the FTS release profile from the fibers, in light of the shells' morphology and degradation profiles. The tensile mechanical properties and their degradation were also studied.

In general, porous shell structures (porosity of 75-92% and pore size of 2-7 μm) were obtained with good adhesion to the core fiber. The FTS release profiles of all studied specimens exhibited a burst effect accompanied by a release rate which decreased with time and lasted for 15-40 days. The process was found to affect the drug-release profile via two routes: (1) Direct, through water uptake and swelling of the structure, leading to a FTS burst release. Degradation of the host polymer affects the FTS release rate at a later stage. (2) Indirect effect of the microstructure on the release profile, which occurs via an emulsion stability mechanism. The copolymer composition is the most important parameter affecting the release behavior in our system.

The copolymer composition was found to be the most important parameter affecting release behavior in our system. A decrease in the lactic acid content of the PDLGA copolymer resulted in an increase in the burst effect and release rate during the first two weeks, mainly due to higher water uptake, swelling and changes in microstructure, but also due to a higher degradation rate of the host polymer.

The release profile of FTS from our new coatings is faster than paclitaxel release (previously studied by us) and more adjustable, and therefore more suitable for the stent application. Furthermore, since FTS is less toxic, some burst release may be tolerated.