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A bilayer swellable drug-eluting ureteric stent: Localized drug delivery to treat urothelial diseases

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Abstract

A bilayer swellable drug-eluting ureteric stent (BSDEUS) is engineered and implemented, as a sustained drug delivery platform technology that enhances localized drug delivery to the highly impermeable urothelium, for the treatment of urothelial diseases such as strictures and carcinomas. On deployment, the device swells to co-opt with the ureteric wall and ensure drug availability to these tissues.

BSDEUS consists of a stent spray-coated with a polymeric drug containing polylactic acid-co-caprolactone (PLC) layer which is overlaid by a swellable polyethylene glycol diacrylate (PEGDA) based hydrogel.

In-vitro quantification of released drug demonstrated a tunable time-profile, indicating sustained delivery over 1-month. The PEGDA hydrogel overlayer enhanced drug release and transport into explanted porcine ureteric tissues *ex-vivo*, under a simulated

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