

Materials and Design for Novel Bioresorbable Electronic Stent that enables Diagnosis and Therapy of In-stent-restenosis

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Currently, the treatment of endovascular diseases coming from vascular blockage are mainly based on angioplasty surgery and following stent implantation for providing mechanical support to various arteries. Although current stents are turned out to be effective in achieving immediate restoration of blood flow, however, the long term re-narrowing induced by the implanted stents are difficult to diagnose or treat. Here we report materials and designs for advanced bioresorbable electronic stent. Bioresorbable and flexible electronics embedded on the stent enables flow sensing, temperature monitoring, data storage, wireless power/data transmission. For advanced therapy, therapeutic nanoparticles are integrated for inflammation suppression, localized drug delivery, and hyperthermia therapy. In vivo and ex vivo animal experiments as well as in vitro cell studies demonstrated that the previously unrecognized potential for bioresorbable electronic implants in the endovascular system.