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Stretchy electronics that can dissolve in your body

abstract

A remarkable feature of the modern integrated circuit is its ability to operate in a stable fashion, with almost perfect reliability. Recently developed classes of electronic materials create an opportunity to engineer the opposite outcome, in the form of devices that dissolve completely in water, with harmless end products. The enabled applications range from □green¹ consumer electronics to bio-resorbable medical implants - none of which would be possible with technologies that exist today. This talk summarizes recent work on this physically □transient type of electronics, from basic advances in materials chemistry, to fundamental studies of dissolution reactions, to engineering development of complete sets of device components, sensors and integrated systems. An □electroceutical¹ bactericide designed for treatment of surgical site infections, a programmable drug release vehicle and a suite of brain monitoring systems provide application examples.