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**Study of Long-Term Biocompatibility and Bio-Safety of Implantable Nanogenerators**

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**Abstract**

Implantable nanogenerator (i-NG) has shown great promises for enabling self-powered implantable medical devices (IMDs). One essential requirement for practical i-NG applications is its long-term bio-compatibility and bio-safety. This paper presents a systematic study of polydimethylsiloxane (PDMS) and PDMS/Parylene-C packaged Polyvinylidene fluoride (PVDF) NGs implanted inside female ICR (Institute of Cancer Research) mice for up to six months. The PVDF NG had a stable in vitro output of 0.3 V when bended for 7200 cycles and an in vivo output of 0.1V under stretching. Multiple advanced imaging techniques, including computed tomography (CT), ultrasound, and photoacoustic were used to characterize the embedded i-NGs

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