

세미나 초록

성명	신미경
소속	성균관대학교 글로벌바이오메디컬공학과
발표 주제	Tissue-adhesive hydrogel biointerfaces for sutureless implantable electronics
발표 내용	<p>Soft and stretchable bioelectronics hold immense appeal due to their mechanical modulus, which aligns with that of biological tissues. Nevertheless, several challenges persist in optimizing biotic-abiotic interfaces to enable long-term and reliable bidirectional electrical stimulation and signal recording. Herein, we propose a hydrogel biointerface with wet-resistant tissue adhesiveness, inspired by mussel byssal threads. This innovation allows for the immediate fixation of implantable electronics onto nerve and cardiac tissues without the need for sutures. Our approach comprises two key components: Firstly, we introduce a strain-adaptive fiber-interlocked bioelectronic patch designed for efficient cardiac interfacing, even in freely moving animals. Secondly, we present injectable tissue-interfacing materials that facilitate bidirectional stimulation and recording on muscle and peripheral nerve tissues. Injecting these materials into tissue defects enables the immediate rehabilitation of rats through a closed-loop robot-assisted system. The integration of such bioelectronics with tissue-adhesive hydrogel interfaces holds promise for the development of sutureless implantable devices, addressing a critical need in the field.</p>