



이름: 손 동 희 / SON DONGHEE

직위: 부교수 / Associate Professor

**소속: 성균관대학교 전자전기공학부 / Sungkyunkwan
University, Electronic and Electrical Engineering**

강연제목: 조직 접착 가능한 신축성 바이오전자소자

Abstract: Tissue-adhesive Stretchable Bioelectronics

Conventional flexible/stretchable devices capable of monitoring bio-signals and delivering the feedback information have been considered as essential functional components in realizing the stable closed-loop bioelectronics. Despite such significant progress, their mechanical and electrical instability, originating from materials fatigue and the absence of tissue adhesion, still remains a challenge in pursuit of strain-durable tissue-interfacing capability.

Here, we report optimal stretchable materials design strategies and device fabrication/integration technologies for the two different kinds of self-healing tissue-adhesive bioelectronics: i) A patch-type platform for either facile peripheral nerve repair (neurorrhaphy) in rodents and nonhuman primates or large-scale conformal cardiac interfacing; ii) A syringe-injection-type platform for instantaneous closed-loop robot-assisted rehabilitation [1-3]. The patch-type self-healing bioelectronics consists of ionically conductive hydrogel adhesive and tough composite electrodes with solid and liquid micro-/nano-fillers, enabling both on-tissue strain-insensitive electrical performance and mechanical adaptation. The injectable tough hydrogel with irreversible yet freely rearrangeable biphenyl bonds and reversible coordinate bonds with conductive gold nanoparticles was applied to injured nerves/muscles for realizing immediate closed-loop robot-assisted rehabilitation and effective tissue regeneration.

Brief Biosketch

서울대학교 화학생물공학부 박사 (2015) / Seoul National University, Chemical and Biological Engineering, Ph.D.

스탠포드대학교 화학공학과 박사후과정 (2016) / Stanford University, Chemical Engineering, Postdoc
한국과학기술연구원 바이오닉스연구단 선임연구원 (2019) / Korea Institute of Science and Technology, Center for Bionics, Senior Research Scientist