<Professor Jae-Woong Jeong's Lab.>

Bio-Integrated Electronics and Systems Laboratory

■ **Contact information**
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■ **Current state of the Lab. (in 2025 Spring Semester)**
Postdoctoral Fellows : 1 PhD Students: 11 Master's Student: 6

■ **Research Areas**

Our mission is to invent the future generation "soft" bioelectronics and biomedical systems for advancing healthcare and biomedical research. Research areas in our group include design and fabrication of flexible/stretchable electronics, photonic microsystems, and microfluidic devices for various applications such as health/wellness monitoring, disease diagnosis and therapy, human-machine interfaces, and neuroscience.

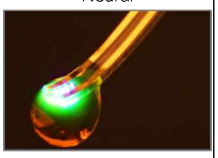
"Wearable" Skin-like Electronics

Epidermal

Conventional biomedical devices mounted on our body are rigid, bulky, and its mechanical properties do not match with the property of the human tissue. Based on flexible/stretchable electronics technologies, our group develops soft, flexible, and stretchable devices with diagnostic and therapeutic capabilities, which can be conformally wrapped on curvilinear-shaped skin. We are broadly interested in stretchy bio-integrated electronics that integrate multiple modalities (e.g. electronics, photonics, and microfluidics)

"Implantable" Soft Electronics

Neural



Implantable devices have been drawing significant attentions in biomedical research for continuous monitoring of force, pressure, temperature, and electrophysiological signals inside living subjects. Implantable electronic systems must be small in size, compatible with biological tissue, and sturdy enough to withstand the physical forces within the body. Our research focus is to develop soft, stretchable sensors and actuators that enable high spatiotemporal resolution recording and control; and that conform to the micro-geometry of 3-D tissue without creating damaging local stresses. Our particular interests are in implantable cardiac devices and wireless multifunctional neural probes for the brain.

"Transformative" Electronics

Transformative

Electronics capable of changing their shape, flexibility, and stretchability will enable versatile and accommodating systems for more diverse applications. Our group investigates design concepts, materials, physics, and manufacturing strategies that enable these reconfigurable electronic systems based on stimuli-responsive materials such as liquid metals. We are interested in developing this technology to create various transformative electronics for applications in wearables, implantables, sensing, robotics, and display.

■ **Recommended courses & Career after graduation**

Recommended courses: MEMS, micro/nanofabrication, circuit design, embedded systems, etc.

Potential career path:
Industry: Electronics, Semiconductor, Medical, etc.
Academia: Univ. Professors, Researchers at National Labs

■ **Introduction to other activities besides research**

We hold annual group party and workshop. In addition, we attend various international conferences including Transducers, MEMS, EMBC, MRS, BMES, etc.

■ **Introduction to the Lab.**

Our group works on multidisciplinary research, crossing the areas of EE, ME, BME, materials, and physics. We are actively collaborating with Washington Univ. School of Medicine, Georgia Tech, Yonsei University Medical School, etc.

■ **Recent research achievements ('23~'25)**

- ***Advanced Materials, Science Advances*** (2025). ***Nature Biomedical Engineering, Science Advances*** (2024). ***Nature Protocols, Nature Communications, Science Advances*** (2023).

[1] "Phase-change metal ink with pH-controlled chemical sintering for versatile fabrication of variable stiffness electronics." ***Sci. Adv.*** 11, eadv4921 (2025).
[2] "Skin preparation–free, stretchable microneedle adhesive patches for reliable electrophysiological sensing and exoskeleton robot control." ***Sci. Adv.*** 10, eadk5260 (2024).
[3] "A temperature-responsive intravenous needle that irreversibly softens on insertion." ***Nat. Biomed. Eng.*** 8, 963-976 (2024).
[4] "Customizable, wireless and implantable neural probe design and fabrication via 3D printing" ***Nat. Protoc.*** 12, 219-237 (2023).