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## 강연제목: 이온젤 게이트 시냅틱 트랜지스터를 통한 운동 복원 및 바이오센싱

## Motion Restoration and Biosensing by Ion-gel Gated Synaptic Transistor

### Abstract:

Ion-gel gated organic synaptic transistors (IGOSTs) are emerging as a promising platform for bioelectronics such as neuroprosthetics and biosensing. These devices are capable of mimic biological neural processes such as real-time, event-driven information processing, offering great potential for next-generation applications. Specifically, IGOSTs enable precise signal modulation by leveraging their high capacitance and tunable electrical properties. By utilizing these biomimetic characteristics, IGOSTs create a versatile platform for both neuroprosthetics and biosensing. In neuroprosthetics, IGOSTs contribute to the development of stretchable neuromorphic efferent nerves that restore natural muscle movement. In biosensing, IGOSTs enhance capacitance coupling, facilitating high-sensitivity biomolecule detection that surpasses the performance of traditional MOSFET-based sensors.

### Brief Biosketch

Dr. Dae-Gyo Seo is a Postdoctoral Researcher in the Department of Materials Science and Engineering at Seoul National University. He earned his Ph.D. from the same department under the supervision of Prof. Tae-Woo Lee, focusing on ion-gel gated organic synaptic transistors (IGOSTs) for neuromorphic computing and bioelectronic applications. During his doctoral studies, he also worked as a Visiting Researcher at Stanford University in Prof. Zhenan Bao's group.

Dr. Seo has published six first-author or co-first-author papers in high-impact journals, including Nature Biomedical Engineering, and contributed to 11 additional publications. He has presented at major international conferences, including the Materials Research Society meetings, and received multiple academic awards. He also co-authored a chapter in the World Scientific Handbook of Organic Optoelectronic Devices. His research interests span neuromorphic electronics, bioelectronics, and next-generation neuromorphic devices.