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## 강연제목: 미세유체를 이용한 단일세포 생물물리 및 기계생물학 (Single-cell biophysics and mechanobiology using microfluidics)

### Abstract:

Numerous cellular processes including cell development, differentiation, migration, and disease progression (e.g., cancer metastasis) accompany changes in cellular biophysical properties, such as cell mass, volume, and stiffness. However, studying the physical and mechanical dynamics is challenging because both the duration and magnitude of cellular changes are heterogeneous across the cell population. Here, we present new methods to monitor the mass and stiffness of single cells during the full cell cycle with a minute-timescale resolution. We utilize the suspended microchannel resonator (SMR), a microfluidic cantilever that measures the buoyant mass of single cells by the change in the resonance frequency. With this device, we studied biophysical dynamics during the cell cycle in ways that have not been possible with existing methods.

### Brief Biosketch

Dr. Joon Ho Kang received his Bachelor's degree in physics, minor in math, from Columbia University in 2012. He then received his Ph.D. in physics, with a specialty in biophysics, from Massachusetts Institute of Technology (MIT) in 2019. In 2019 fall, he joined Korea Institute of Science and Technology (KIST) as a part of the military service. Since 2021, he has been a senior research scientist in the Brain Science Institute at KIST. His research mainly focuses on the quantitative understanding of biophysics and mechanics at a single-cell level. He is a past recipient of the Korea Presidential Science Scholarship and Samsung Scholarship for his B.A. and Ph.D. studies, respectively.