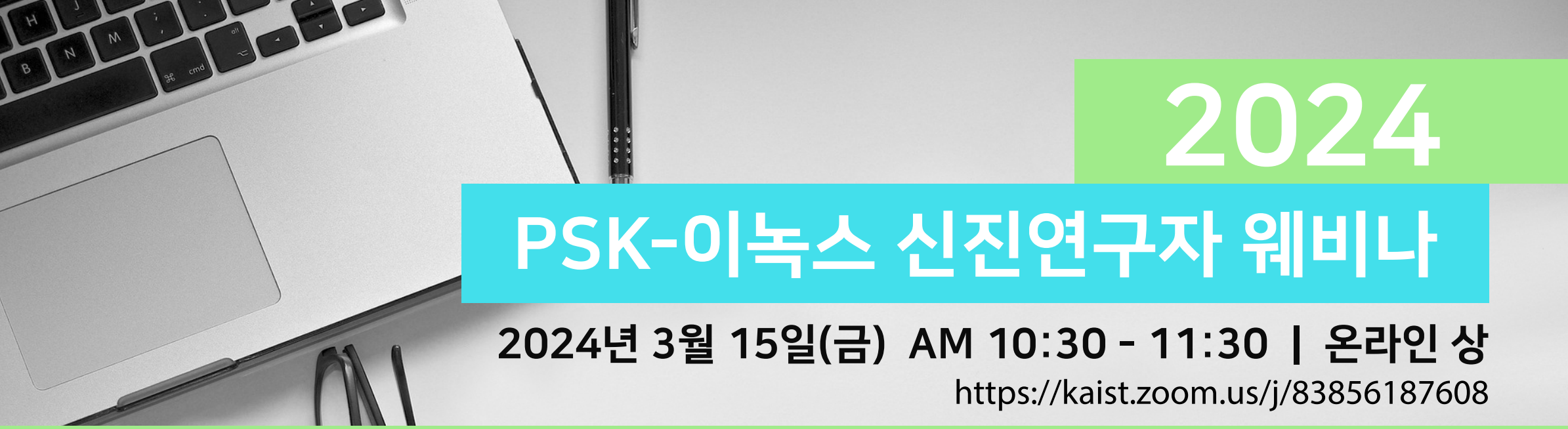

2024 PSK-이녹스 신진연구자 웨비나

2024년 3월 15일(금) AM 10:30 - 11:30 | 온라인 상

https://kaist.zoom.us/j/83856187608

주최 한국고분자학회 주관 콜로이드 및 분자조립 부문위원회 후원 INNOX

○ 초대의 글

'PSK-이녹스 신진연구자 세미나'는 우수한 연구역량을 가진 신진연구자를 발굴하여 교류의 장을 넓히고자 (주)이녹스의 후원과 한국고분자학회 주최로 마련한 온라인 세미나입니다. 이번 세미나에서는 고분자 분야 중에서도 특히 콜로이드 및 자기조립소재를 이용하여 선도연구를 수행하는 신진연구자의 우수한 연구성과를 공유하는 자리를 마련하였으니 관심있는 분들의 많은 참여 부탁드립니다

○ 일정

AM 10:30 - 11:30

Phase-changing Peptide Nanoemulsions Enabling Real-time Imaging of Macrophages *In situ*

Inhye Kim (김인혜), ipk5141@psu.edu
(Biomedical Engineering Department, The Pennsylvania State University)

ABSTRACT : Macrophages are innate immune cells that are crucial to defending against infectious disease, repairing damaged tissues, and modulating inflammatory pathologies. These diverse roles have attracted recent attention towards engineering macrophages for diagnostic and pharmacologic applications, particularly cell-based immunotherapies. However, realizing the full potential of macrophages requires parallel advances in imaging technologies that can monitor the migration of these cells within tissues in a non-invasive, real-time, and long-term manner. Such innovations would allow us to better predict therapeutic efficacy, understand variability in patient responses, and enable early intervention of adverse events. This talk will cover phase-changing nano-emulsions that can be readily taken up by macrophages and generate echogenic microbubbles upon ultrasound exposure, enabling real-time imaging of the labeled immune cells in situ. The contrast agent is prepared using a de novo designed peptide emulsifier that stabilizes ultrasound-sensitive liquid perfluorocarbon nanodroplets in water, and is designed to rapidly bind to, and be internalized by, macrophages. A rational control over the interfacial assembly of the peptide emulsifier affords formulations with tunable acoustic sensitivity, macrophage uptake, and in cellulo stability. The emulsion-loaded macrophages can be visualized using standard diagnostic B-mode and Doppler ultrasound modalities without compromising cellular viability. This allows on-demand and real-time tracking of macrophages within porcine coronary arteries, as an exemplary model. These results suggest this platform is poised to open new opportunities for non-invasive, contrast-enhanced imaging of cell-based immunotherapies in tissues while leveraging the low-cost, portable, and safe nature of diagnostic ultrasound.

한국고분자학회
The Polymer Society of Korea