

2021 年度 第1回 生命科学技術国際卓越講義

*World-leading Innovative Lectures
in Life Science & Technology
The University of Tokyo*



Biomechanical Approaches To Understand Mechanisms of Acute Kidney Injury

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Date: Tuesday, 20th, 2021

Time: 8:00AM ~ 9:00AM

Venue: Zoom (meeting URL will be sent after registering)

Participants: Up to 500 participants

Please register by this QR code or clicking the following link

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Abstract: The nervous and immune systems have long been studied independently, however over the last few decades considerable advances have been made that indicate these two systems are linked to maintain normal homeostasis as well to respond to stress and pathophysiological disorders. Recent advances have identified neural pathways that regulate immunity and inflammation via the inflammatory reflex pathway, identifying specific molecular targets that can be modulated by stimulating neurons electrically. Neuroimmunomodulation by non-pharmacological methods is emerging as a novel therapeutic strategy against inflammatory diseases including kidney disease. For example, electrical stimulation of vagus nerves or treatment with pulsed therapeutic ultrasound activates the cholinergic anti-inflammatory pathway and protects mice from acute kidney injury. Direct innervation of the kidney, including afferent and efferent neurons, may play a role in modulating and responding to inflammation in various diseases either locally or by providing feedback to regions of the central nervous system that are important in the inflammatory reflex pathway. Optogenetic tools that enable selective stimulation of specific neurons have uncovered neural circuits in the brain that modulate kidney function via activation of the cholinergic anti-inflammatory pathway, and these techniques will be valuable in dissecting other neural pathways that control immunity and inflammation. This talk will highlight studies that define neural circuits that control inflammation and that may serve as targets for therapy of kidney diseases such as acute kidney injury, kidney fibrosis and hypertension.

Organizer: World-leading Innovative Graduate Study Program for Life Science and Technology

Cooperation: Graduate Program for Leaders in Life Innovation, The University of Tokyo

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