



第8回 トランスボーダー医学研究センターセミナー

Transborder Medical Research Center Seminar

演題：空間マルチオミクス技術の開発

～Development of Spatial Multi-omics Technology～

演者：Rong Fan

Harold Hodgkinson Professor of Biomedical
Engineering, Yale University, Professor of Pathology,
Yale School of Medicine, USA

日時：2026年7月2日（木）10:00～11:00

会場：イノベーション棟 8階 講堂

要旨：Dr. Fan has focused on developing and applying single-cell and spatial omics technologies to study human tissue function in normal physiology, aging, and disease. He developed a single-cell 42-plex cytokine assay, which remains the highest multiplex platform for measuring single-cell protein secretion. He also conceived and demonstrated the first “spatial multi-omics” sequencing approach by developing deterministic barcoding in tissue (DBiT), enabling transcriptome-wide and approximately 300-protein mapping pixel-by-pixel directly on fixed tissue sections. His research further introduced a new dimension in spatial omics—“spatial epigenomics”—through spatial-ATAC-seq, spatial-CUT&Tag, and spatial epigenome-transcriptome co-profiling. More recently, he developed Patho-DBiT for pathology-compatible spatial profiling of diverse RNA species, including mRNA, splicing isoforms, microRNA, tRNA, snoRNA, snRNA, single nucleotide variants, and RNA editing in archival FFPE tissue specimens. These technologies have been applied to human and mouse brain development, neuroinflammation, senescence and aging, tumor initiation, progression, and metastasis, as well as cardiovascular disease. Spatial multi-omics is poised to drive the next wave of biomedical research and facilitate clinical biomarker discovery and therapeutic development.

【主催】トランスボーダー医学研究センター（TMRC）<http://www.md.tsukuba.ac.jp/tmrc/>

【共催】関東次世代のがん専門医療人養成プラン（筑波大学がんプロ事務局）

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