IPR-RIMD Seminar

Sep. 24 15:30-16:30
Biken Hall
Main Bld 1F　RIMD

"Using SABER to amplify multiplexed FISH and IF signals in situ"

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Fluorescent in situ hybridization (FISH) and immunofluorescence (IF) techniques can provide quantitative information about the localizations and quantities of molecular species in fixed cells and tissues. However, challenges such as high tissue autofluorescence and slow imaging times due to long exposures continue to hinder our ability to map large tissues efficiently. Moreover, visualizing more than a few targets simultaneously can be tedious or impossible with standard methods. In this talk, I will introduce our newly developed signal amplification by exchange reaction (SABER) technique, which can be used to increase multiplexed signal levels from nucleic acid (SABER-FISH) or protein (Immuno-SABER) targets. Long, single-stranded DNA concatemers that are generated in vitro are applied simultaneously to targets of interest in situ to act as binding scaffolds for a multitude of short complementary strands conjugated to fluorophores ('imagers'). In different scenarios, we show that SABER can be used to amplify signal levels up to 450-fold, deployed against at least 17 targets simultaneously, and combined with expansion microscopy to achieve super-resolution imaging. The modularity, scalability, and cost-effectiveness of the SABER method make it a promising technique for future tissue mapping applications.

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