

## 27<sup>th</sup> nanobiofluids seminar

2026 September 16th, 9:00-10:00  
Seminar Room (Room 104), 1st Floor, Bldg. No.2  
<https://www.infront.kyoto-u.ac.jp/en/access/>  
[Zoom link](#)

### Applications in Spatial Biology



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#### Abstract

Traditional high-throughput technologies have focused on generating detailed parts lists of the components in biological systems. Listing the components misses most of the story however. Biology works in three dimensions and the location and relation of molecules to one another in space is crucial to understanding how a system works. In my talk I will introduce several ongoing projects within the field of spatial biology, a field which aims to map biological molecules in their native context. First, I will describe my work in creating multivalent insulin-DNA origami nanostructures, which were used to interrogate clusters of insulin receptors on the cell surface. I will then detail the nascent field of DNA-sequencing-based microscopy which uses a self-assembled network of synthesized DNA strands to determine the relative location of DNA, RNA, and proteins within tissues and cells. I will describe our current work developing chip-based platforms which we hope will democratize this approach and make microscopy-by-sequencing accessible to any lab with access to a sequencer.

#### Biography

Joel Spratt is a Researcher in the Department of Gene Technology at KTH – Royal Institute of Technology in Stockholm, Sweden. He focuses on developing new technologies to study the spatial distribution of various biomolecules in cells. Joel graduated from McGill University in Montreal, Canada with a B.Sc. in 2014 and he earned his Ph.D. in Biophysics at the University of Oxford in 2019. During his Ph.D., he used tools from the field of DNA nanotechnology to investigate the composition of large protein complexes in bacteria. For his postdoctoral training, he worked at Karolinska Institutet in Stockholm where he designed insulin-DNA nanostructures for use in the study of the spatial distribution of receptors on the cell surface.

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