Research Project Proposal for Master's Degree

Painting cells with DNA

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Duration: 6 months – 1 year

Number of students: 1

Project Summary:

Have you ever wondered what the nanoscopic architecture inside a cell looks like? Would you be interested to investigate subcellular processes by reconstructing detailed images of their components? Would you like to propose novel mechanisms and rule out outdated hypotheses? Are you interested to learn about super-resolution fluorescence microscopy, computer programing and data analysis, biochemistry and molecular cell biology? Then join the lab to use DNA to image with almost atomic resolution the spatial molecular circuitry of proteins inside cells!

→ The aim of the project is to develop the DNA-PAINT technique to create nano-meter resolved spatial maps of proteins. The technique will then be applied to study a cancer associated signaling system in human cells or the coat formation process of in bacteria.

To carry out this project you will need/learn to do molecular biology, protein biochemistry, in vitro assays, fluorescence microscopy, cell imaging, computer modeling and/or optics.