SMART Center

LSA BIOPHYSICS
UNIVERSITY OF MICHIGAN

CENTER FOR RNA BIOMEDICINE
UNIVERSITY OF MICHIGAN

SINGLE M OLECULE

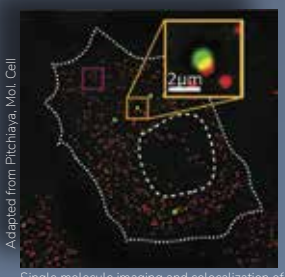
singlemolecule.lsa.umich.edu

Single Molecule Imaging and Characterization

*The Center for **S**ingle **M**olecule **A**nalysis in **R**eal-**T**ime (**SMART**) provides instrumentation for single molecule detection and manipulation for U-M researchers, along with expert project advice and instrument training. We're happy to meet with you and your group to introduce you to our core's services and brainstorm potential applications to your projects!*

Single Particle Imaging

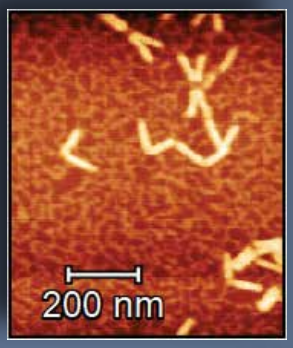
- smFISH
- smFRET
- PALM/STORM/ DNA-PAINT
- Particle tracking
- Colocalization
- Multiplexed sequential imaging



Single molecule imaging and colocalization of μRNA and processing bodies

Atomic Force Microscopy

- Nanoscale topography imaging
- Mechanical measurements

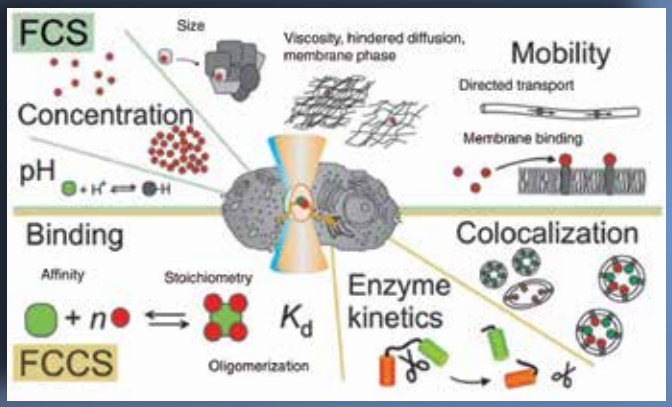


AFM topograph of DNA origami "tweezers," with individual DNA strands in background. Courtesy of Walter lab.

Fluorescence Lifetime

- Lifetime imaging
- Time-resolved FRET
- Fluorescence anisotropy

Fluorescence Fluctuation Spectroscopy

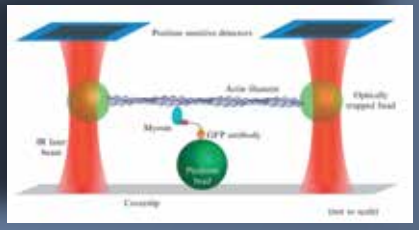


Diverse measurands accessible via fluorescence fluctuation spectroscopy. Bacia et al., Nature Methods (2006)

- Binding stoichiometry and kinetics
- Diffusion and mobility
- Homogeneous measurement in complex fluids or in cells

Cell and Molecular Force Measurements

- Protein force and displacement
- DNA winding mechanics
- Cell stiffness
- Binding energy
- Condensate mechanics



Example of optical tweezer assay for measuring myosin force/step size. Sung, et al., Meth. Enzymology (2010)

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