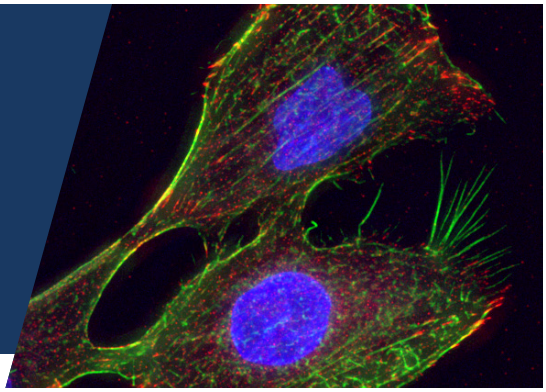
FRED HUTCH

# Cellular Imaging Equipment

**FRED HUTCHINSON CANCER RESEARCH CENTER**
SEATTLE, WA • 501(C)(3) NONPROFIT



**FOR MORE INFORMATION**

Cellular Imaging
206.667.1215
***imaging@fredhutch.org***

## Nikon TIRF/STORM

Widefield fluorescence and total internal reflection fluorescence microscope with super resolution (N-STORM)

**Excitation sources:** Lasers: 405, 488, 561, 640 and 640 nm high power for STORM imaging

**Objectives:** 10x/0.3, 60x/1.49, 100x/1.49

**Camera:** Andor iXon X3 EMCCD camera with 512 x 512 pixel chip (16 micron pixels)

### Capabilities

- Four-channel (blue, green, red, far red) TIRF
- Super-resolution localization microscopy (N-STORM)
- Time-lapse imaging

### Recommended uses

- High-contrast fluorescence imaging of molecules at the cell membrane (vesicular transport, adhesion, membrane receptors), including time lapse
- Imaging of in vitro reconstituted systems (such as molecular motors, microtubule assembly, etc.)
- Single molecule detection
- Super-resolution imaging (localization microscopy) of fixed specimens

### General information

Total internal reflection fluorescence, or TIRF, microscopy uses evanescent wave technology to restrict fluorescence excitation to a very thin layer of approximately 100 to 200 nm near the coverslip surface, greatly reducing background fluorescence and improving image contrast. Therefore, TIRF is ideally suited for the detection of faint signals at or near the cell surface, and for the detection of molecules in in vitro reconstituted systems. Stochastic optical reconstruction microscopy, or STORM, is a super-resolution technique that relies on the precise localization of individual molecules to provide image resolution down to a few tens of nanometers.

Our Nikon system combines TIRF and STORM on a single microscope. The system is equipped with the latest EMCCD technology (Andor iXon X3 EMCCD camera), capable of providing single-molecule detection sensitivity. The system includes a four-laser launch with 405, 488, 561 and 640 nm laser lines for excitation of blue, green, red and far red dyes and fluorescent proteins. The system is capable of TIRF (as well as conventional fluorescence) imaging in four channels (blue, green, red, far red).

The microscope is built on a Nikon Ti fully automated inverted microscope with Perfect Focus, motorized x,y stage and fast piezo z stage. It uses Nikon NIS Elements software.

*The Nikon TIRF/STORM microscope was funded in part by a generous grant by the M.J. Murdock Charitable Trust.*