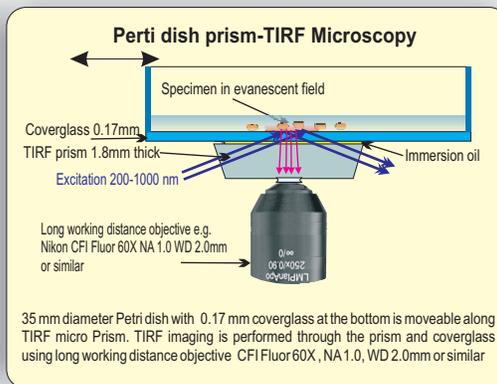
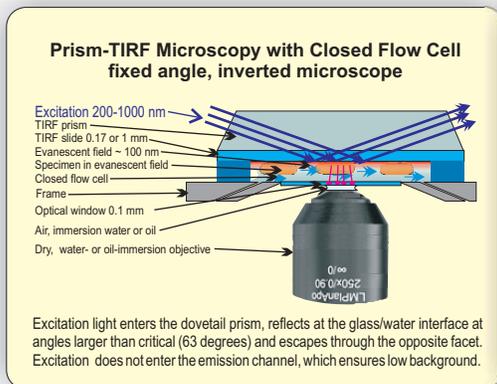




Prism-based TIRF Microscopy



Selected geometries of prism-based TIRF Microscopy

Total Internal Reflection Fluorescence (TIRF) has become a method of choice for single molecule detection and other studies that require confined in space excitation of fluorescence. TIRF provides submicron optical slicing - it excites only ~100 nm of the specimen with maximum intensity of the evanescent wave at the surface. Prism-based geometry ensures the “cleanest” TIRF effect and the best signal-to-background ratio, which has been documented in the literature [1-4]. TIRF Labs’ pTIRF systems are well-suited for working with closed flow cells or open perfusion chambers either on upright or inverted microscopes. We offer state-of-the-art pTIRF microscopy with different schemes; three of them are shown in the figures above. TIRF Labs also offers pTIRF with semisphere prism for variable angle TIRF (not shown), as well as lightguide- and objective-based TIRF. Contact TIRF Labs to better determine which geometry is better suited for your applications.

pTIRF provides the lowest background fluorescence, the lowest scatter, and hence the best signal-to-background ratio. See the brochure **Compare TIRF Geometries** for details. If your application permits, prism-TIRF is the geometry to consider at the first place. pTIRF can be used for a variety of applications, including single molecule detection, analysis of biomolecular interactions, characterizing of antibody- and nucleic acid-based assays, real-time microarrays, membrane biophysics, and other studies.

pTIRF systems are compatible with dry, water-, and oil immersion objectives. TIRF Labs offers pTIRF systems for upright and inverted microscopes, with open perfusion and closed flow chambers. 1-mm thick slides or 0.12-0.24 mm coverslips made of glass or silica can be used with pTIRF. Our pTIRF systems are equipped with advanced microfluidics, which allows for operating with sub-microliter amounts of solutions. We also offer a pTIRF system for TIRFing specimens in Petri dishes, as shown in the figure above. Most of our pTIRF accessories are factory aligned systems: the angles of incidence of the excitation light are fixed to provide reproducible intensity of the evanescent wave. If decreased depth of penetration is necessary, TIRF Labs offers special optical traps; the traps extinguish low angles of incidence, which results in decrease of the penetration depth. TIRF Labs also offers broad range of computer-controlled and manually-operated illuminators. For more information visit www.tirf-labs.com.

Literature:

1. Ambrose W, Goodwin P, Nolan J. *Single-molecule detection with TIRF: comparing signal-to-background in different geometries*. Cytometry 1999, 36(3), 224.
2. Brunstein M, Teremetz M, Héroult K, Tourain C, Oheim M. *Eliminating unwanted far-field excitation in objective-type TIRF. Part I*. Biophys J. 2014; 106(5): 1020.
3. Brunstein M, Héroult K, Oheim M. *Eliminating unwanted far-field excitation in objective-type TIRF. Part II*. Biophys J. 2014; 106(5): 1044.
4. Simon S. *Partial internal reflections on total internal reflection fluorescent microscopy*. Trends Cell Biol, 2009, 19: 661.

Prism-up TIRF (puTIRF) Microscopy Flow Cell System
for inverted microscopes installed on the motorized XY translation stage. puTIRF is well suited for single molecule detection FRET experiments and other multicolor TIRF applications. puTIRF is designed as add-on accessory for inverted microscopes

Four versions of TIRF slides and fluidic chamber for puTIRF

- 1- Use drilled 1" x 3" slide with pre-installed flow chamber.
- 2- Use fluidic block with optical window and elastic gasket. The flow cell is formed by the gasket between slide and optical window.
- 3- Arrangement similar to version 2, but using 1" x 1.5" slide.
- 4- Use 1" x 1.5" slide with flow cell formed by fluidic block.

Prism-based TIRFM

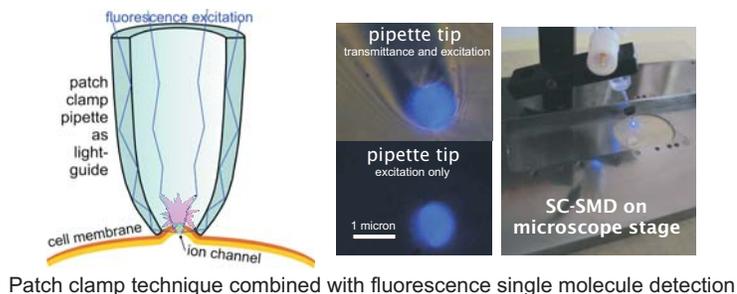
iDiagnostics (iTIRF Arrays)
TIRF Spectroscopy
TIRF Microscopy



TIRF Labs

Total Internal Reflection Fluorescence

Single ion Channel Single Molecule Detection



iDiagnostics
cellphone based molecular diagnostics



We extended TIRF into 3rd dimension and invented iDiagnostics
 Now you can hold a hospital laboratory in the palm of your hand

**Turnkey Single Molecule Detection
 TIRF Microscopy Station**

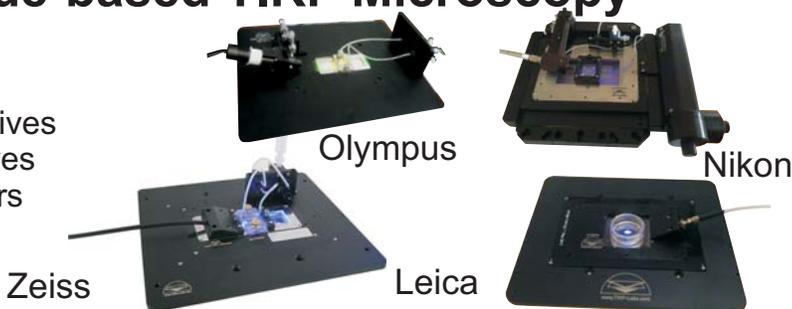
Modular TIRF station includes:

- Fluorescence microscope
- Ig-, p-, or/and o-TIRF microscopy flow systems
- Low light EM CCD camera Andor Technologies
- Multi-color computer-controlled illuminator
- Digital fluidics SmartFlow
- Potentiostat and/or wave-function generator
- TIRF Studio software for instrument control



Prism-, and Lightguide-based TIRF Microscopy

- Superior signal-to-background ratio
- Well-suited for single molecule detection
- Use YOUR microscope and YOUR objectives
- Use with dry, water-, and oil-imm. objectives
- Use Xenon lamp, LED, or laser illuminators
- Open perfusion or closed flow chambers
- Install/uninstall in less than one minute



TIRF Accessories for Fluorometers

- **TIRF Accessory** transforms your spectrofluorometer into a super-sensitive TIRF biosensor instrument
- Optional electrochemical, DEP and temperature control
- **SmartFlow** Fluidic System allows to run unattended TIRF experiments, measure sensograms to derive k_{on} and k_{off}
- Advanced fluidics allows for handling nanoliter volumes

