Two-photon Excitation Microscopy

Two-photon excitation microscopy is best at reducing out-of-focus excitation, reducing the risk of bleaching a volume of the sample before the imaging process is completed. The two-photon process requires high photon density, which is achievable at the focus point of the objective with ultra-short light pulses. TPEM may reduce photo-toxicity and help to improve live cell imaging. The longer wavelength range required for the technique can make it possible to image thicker samples compared to excitation in the ultraviolet and visible ranges.

Specifications

Light Source	Ultra-fast Mira laser in fs mode
Excitation wavelength	700 to 1000 nm
Pulse repetition rate	76 MHz tunable to 4.75 MHz
Objective lens	63x/0.9NA, 2.2 mm working distance
Detection	Descanned (2 detectors with emission filter wheel) Non-descanned

Settings

This system uses the Verdi / Mira / Pulse Picker / Harmonic Generator suite. Pulse width and repetition rate are selected to avoid bleaching the sample.