

Imaging membrane interfaces and secondary protein conformation in cell cultures with vibrational infrared photothermal and phase signal (VIPPS) microscopy

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Abstract

Mid-infrared photothermal microscopy has demonstrated unique capabilities in the field of chemical imaging including sub-diffraction limited resolution and sub cellular imaging. Vibrational Infrared Photothermal and Phase Signal (VIPPS) introduces an additional contrast mechanism based on different thermal properties. This enables high contrast imaging of features with overlapping absorption profiles but different thermal diffusion characteristics. Our approach paves the way for high contrast sub-diffraction limited imaging of secondary protein conformations in fibroblast cells grown in a protein rich collagen matrix at the subcellular level.