

## Total Internal Reflection Holographic Microscope

**R**esearchers at the University of South Florida have developed Total Internal Reflection Holographic Microscopy (TIRHM) which is a technique that is capable of overcoming these limitations. By applying techniques of digital holography to TIR, researchers are able to generate quantitatively precise images of live cell-substrate interface.

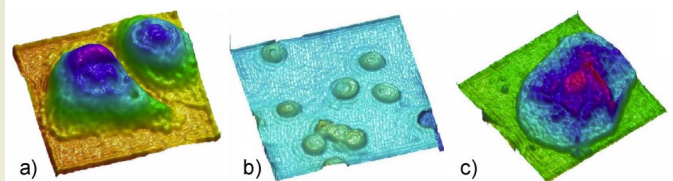
Cell-substrate interactions including attachment, spreading, morphology changes, and migration require a complex series of events to occur in a regulated and integrated manner. Cell migration, for example, plays an important role in numerous physiological and pathological processes, such as morphogenesis, wound healing, and tumor metastasis.

To date, the primary tools for imaging and studying these processes have been total internal reflection fluorescence microscopy (TIRFM) and interference reflection microscopy (IRM). The IRM technique allows estimation of interface thickness profile, however, noise reflected from the cell body beneath interferes and allows only a qualitative interpretation of the surface profile.

### ADVANTAGES:

- **Nanometer precision**
- **High signal to noise ratio allows precise quantitative measurement of surface features**
- **Observe ligand-receptor interaction for purposes of drug discovery**

### *Precision Imaging of Cell Surface Morphology*



### *Quantitative Phase Microscopy by Digital Holography a) SKOV-3 Ovarian Cancer Cells b) Red Blood Cells c) Cheek Epithelial Cell*

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