

There is an opening for a 3-years PhD Scholarship with the Graduate Program in Nanotechnology, at the University of Trieste, Italy: <http://web.units.it/dottorato/nanotecnologie/en>

PhD Project title:

Multimodal Phase Imaging and Optical Manipulation for Biomarker Characterization in Biomedicine

Description

Multimodal Phase Imaging (MPI) includes holography and speckle real-time imaging to assess cellular and subcellular biomechanical information in living cells: cell volume, dry mass, nucleus volume, membrane dynamics. Quantified, this information represents the base for free-label biomarker definition and characterization. Optical Manipulation (OM) on the other hand, uses laser light to trap and manipulate micro and nanoparticles in fluid. Combining imaging and manipulation modalities into a multimodal platform enables fast diagnosis of dry and wet biopsies in Biomedicine. The aim of this PhD project is to combine MPI and OM into a common device and develop a fast technique for liquid biopsy with high sensitivity and specificity. The project will be developed in the Nano-Biomechanics Lab at the Italian National Research Council CNR-IOM Trieste (www.iom.cnr.it). Optimization of existent instrumentation and experimental techniques and development of new methods are planned in interaction with local biomedical engineering industry.

We seek an enthusiastic and motivated candidate with a master's degree in applied physics, engineering or biotechnology. A background in numerical simulation and microscopy would be an asset. The successful candidate will collaborate with other researchers in the group, as well as with collaborative industrial partners and scientific community. Visits to other collaborative organizations and presentation of scientific work at conferences will be encouraged.

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