

# Advances in Diagnostics and Theranostics Using Optoacoustic Imaging

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Optical imaging is unequivocally the most versatile and widely used visualization modality in the life sciences. Yet it has been significantly limited by photon scattering, which complicates the visualization of tissue beyond a few hundred microns. For the past few years, there has been an emergence of powerful new optical and optoacoustic imaging methods that offer high resolution imaging beyond the penetration limits of microscopic methods. The talk discusses progress in multi-spectral opto-acoustic tomography (MSOT) and mesoscopy (MSOM) that bring unprecedented optical imaging performance in visualizing anatomical, physiological and molecular biomarkers. Advances in light technology, detection methods and algorithms allow for highly-performing visualization in biology and medicine through several millimetres to centimetres of tissue and real-time imaging. The talk demonstrates implementations in the time and frequency domain, showcase how it is possible to accurately solve fluence and spectral coloring issues for yielding quantitative measurements of tissue oxygenation and hypoxia and demonstrate quantitative in-vivo measurements of inflammation, metabolism, angiogenesis in label free mode.