

## Professor Malini Olivo

B.Sc (Hon), B.Ed (Hon) U.Malaya, 1985  
PhD BioMedical Physics ( UCL, UK) 1990

### Present Appointments:

SFI Stokes Professor of Biophotonics, School of Physics,  
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### Research Interest :

Biophotonics in Medicine and Biology  
NanoBiophotonics  
Nanomedicine

### Research Background

Prof Malini Olivo is a pioneer in the area of clinical applications of Photomedicine in optical photodiagnosics and Phototherapeutics.

The focus of my laboratory is to investigate minimally invasive novel optical methods for cancer detection and therapy using biophotonics and nanotechnology.

The novel optical methods being investigated are Surface Enhanced Raman Spectroscopy and Imaging (SERS) for biosensing and bioimaging; SERS spectroscopy and imaging with nanophotonics is being investigated for protein and biomarker sensing and tracking in cells and tissues both in-vivo and in vitro. Endoscopic catheter based in vivo cellular imaging systems using in-vivo multiphoton confocal microscopy, Optical Coherence Tomography (OCT) and photothermal imaging are combined with novel bio-chemo-synthetic optical probes and their formulations. These novel optical methods are compared with currently used fluorescence and autofluorescence detection methods in translational medicine. Our major objective is to devise optical on-line real time imaging and therapeutic systems. We are also using image processing software and endomicroscopic approaches to develop an optical biopsy technique to stage cancer. Our ex-vivo methods in fluorescence based cytology of biofluids combines the use of multiphoton confocal microscopy and fluorescence life-time imaging to stage cancer histopathologically. This may prove to be a superior method to the current widely used gold standards i.e white light endoscopy and histopathology.

The laboratory is also investigating the treatment of head and neck, and bladder cancers using novel formulations of photosensitizer and optical imaging technologies.

### Selected Recent Publications:

#### **PUBLISHED 150 PEER REVIEWED JOURNAL PAPERS AND 170 CONFERENCE PAPERS**

1. **Olivo M\***, Thong SP, Chin WWL, Bhuvanewari R, Mancner K, Soo KC. "Fluorescence Diagnostic Imaging of Lesions in the Human Oral Cavity using Hypericin." **British J Cancer** **101(9):1580-4, 2009**.
2. Bhuvana R, Thong SP, Soo Khee Chee and **Olivo M\*** Evaluation of hypericin-mediated photodynamic therapy in combination with angiogenesis inhibitor bevacizumab using in vivo fluorescence confocal endomicroscopy. **J Biomedical Optics**, **14, 011114 , 2010 (e pub)**
3. Dong H, Gong YD, Paulose V, Shum P, **Olivo M\***. "Effect of input states of polarization on the measurement error of mueller matrix in a system having small polarization-dependent loss or gain." **Optics Express** **17(15): 13017-30, 2009**.
4. Cho SJ, Ahn YH, Maiti KK, Dinish US, Fu CY, Thoniyot P, **Olivo M\***, **Chang YT\*** Combinatorial synthesis of a triphenylmethine library and their application in the development of surface enhanced Raman scattering (SERS) probes. **Chem Commun (Camb)**. **7;46(5):722-4, 2010**.

5. Fan HM, Yi JB, Yang Y, Kho KW, Tan HR, Shen, Ding J, Sun XW, **Olivo M**. “Single-Crystalline MFe<sub>2</sub>O<sub>4</sub> Nanotubes/Nanorings Synthesized by Thermal Transformation Process for Biological Applications” **ACS Nano** **3(9): 2798–2808, 2009**.
6. Kah JCY, Mhaisalkar S, Sheppard CJR, **Olivo M.\*** Control of optical contrast using gold nanoshells for optical coherence tomography imaging of mouse xenograft tumor model *in vivo* **J Biomed Opt.** **14(5):054015, 2009**.
7. Kah JC, Chow TH, Ng BK, Razul SG, **Olivo M\***, Sheppard CJ. Concentration dependence of gold nanoshells on the enhancement of optical coherence tomography images: a quantitative study. **Appl Opt.** **2009 1;48(10):D96-D108..**
8. Chin WW, Thong PSP, Bhuvaneshwari R, Soo KC, Heng PW, **Olivo M\***. “In-vivo optical detection of cancer using chlorin e6-polyvinylpyrrolidone induced fluorescence imaging and spectroscopy”. **BMC Medical Imaging**, **9(1):1, 2009**.
9. Thong PSP, **Olivo M**, Kho KW, Zheng W, Mancer K, Harris M and Soo KC. Laser confocal endomicroscopy as a novel technique for fluorescence diagnostic imaging of the oral cavity. **J Biomedical Optics** **12(1): 014007, 2007**
10. Kah JC, Kho KW, Lee CG, James C, Sheppard R, Shen ZX, Soo KC, **Olivo M\***. Early diagnosis of oral cancer based on the surface plasmon resonance of gold nanoparticles. **Int J Nanomedicine** **2(4):785-98, 2007**.
11. Y Xu, M F Wang, C S Premachandran, K W S Chen, N Chen and **M Olivo\***. Platinum microheater integrated silicon optical bench assembly for endoscopic optical coherence tomography. **J of Micromechanics and Microengineering (In press), 2009**.
12. Feng Lin, **Malini Olivo** and Kung . Biomedical Imaging , eds Springer verlag,, 2009 (**Book**)