Nonlinear optical bio-imaging

a.. THE BACKGROUND to the research –
The three areas of focus in my research are nonlinear optical bio-imaging, drug-membrane interactions, and ultrafast spectroscopic studies of biologically relevant systems. My research aims at using laser spectroscopy and microscopy to understand fundamental physical and chemical changes involved in biological reactions.

b.. THE OUTCOMES –
- Observation of biochemical changes during cell differentiation
- The mechanism by which drug molecules modify the phase behaviour of membrane
- Significance of excited state intramolecular hydrogen transfer in a number of natural pigments which exhibit medicinal effects

c.. TWO PICTURES –
Second Harmonic Generation (SHG) Imaging of skin tissue. Collagen produces strong SHG signals.

Dr Tak W. Kee

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d.. PROGRESS TO DATE
- Nonlinear optical microscope has been characterised and studies are underway.
- Confocal fluorescence imaging of model membrane has been performed. A range of useful fluorescence probes have been identified and experiments are underway.

e.. THINGS STILL TO DO –
- Development of novel optical imaging techniques
- Understanding lipid domain formation and its implication in cell signalling

f.. CONTACT DETAILS -
Dr Tak W. Kee
Lecturer
Department of Chemistry
School of Chemistry and Physics
University of Adelaide
Phone: +61-(0)8-8303-5039
Email: tak.kee@adelaide.edu.au