

## **“Molecular fingerprinting and mapping of living cells by Raman microspectroscopy”**

**Hiro-o Hamaguchi, Ph.D.**

Chair Professor, National Chiao Tung University

### **[Abstract]**

Invention of a new microscopy always advances our understanding of life. Confocal Raman microspectroscopy, which is an alliance of Raman spectroscopy with confocal microscopy, is no exception. It is conferring biology with a new prospect for *in vivo* observations of dynamical biological processes at the molecular level. All biological processes, birth, life and death, result from dynamic interactions of ensembles of molecules in cells, tissues, organs and organ systems. Raman microspectroscopy provides time- and space-resolved Raman spectra or the “molecular fingerprints” that contain otherwise unobtainable information on molecules that take parts in these biological processes. Raman microspectroscopy offers the advantage of label-free monitoring of molecules, being suitable for exploratory studies of unknown molecular species that play important roles in fundamental biological processes. Application of Raman microspectroscopy to a wide range of biology/medicine will be discussed with the introduction of the state-of-the-art linear and non-linear Raman microspectroscopy techniques developed in the author’s group.