

Journal of Fluorescence Special Issue—Advances in Single Molecule Spectroscopy

© Springer Science + Business Media, LLC 2007

The field of single molecule imaging and spectroscopy has grown exponentially over the last two decades. More than a thousand publications on single molecule spectroscopy have been appeared to date. Single molecule detection and fluorescence-correlation spectroscopy are becoming almost routine with the use of the word “Spectroscopy,” replacing the once widely used word “detection” when referring to single molecule studies.

Detection of single molecules represents the ultimate level of sensitivity and has been a longstanding goal of analytical methods. Fluorescence is one obvious choice for single molecule spectroscopy due to its high sensitivity and the fact that the signal appears against a dark background, i.e. low noise. Single molecule spectroscopy is a powerful method that bypasses ensemble averaging and provides direct information on the physical, chemical, or biological properties and/or kinetics of molecules on a truly molecular basis, in contrast to conventional methods. With recent advances in lasers, optics, detectors, nanotechnology, computational power and commercial availability of instruments for single

molecule measurements, the single molecule technique has become enormously popular particularly in biological and medical research.

Under the umbrella of this special issue entitled ‘Advances in Single Molecule Spectroscopy,’ we attempt to focus on the wide range of applications of the single molecule technique on physical, chemical and biological systems. The editors of this issue would like to thank all the authors for their timely and invaluable contributions to this issue. Clearly, this special issue on single molecule spectroscopy is far from comprehensive. Nevertheless, we hope this issue will highlight some of salient aspects of the advancement of single molecule spectroscopy, thus furthering the interest in the wider scientific community across many disciplines such as Physics, Chemistry and Biology.

Chris D. Geddes, Ph.D.
Krishanu Ray, Ph.D.
Special Issue Editors
August 16th 2007