Towards highly fluorescent dyes and their applications

Fluorescence is one of the most powerful tools used in diagnostics (e.g., ion sensing), because of its extreme sensitivity, low concentration of dye required, and ease in accumulating a good signal-to-noise. A rather pertinent example is in the medical field where fluorophores are routinely used in cell imaging, analyte recognition and the detection of radicals. However, autofluorescence (i.e., background noise from other chromophores) can be a problem, especially if there is considerable overlap of fluorescence signals from multiple chromophores. A number of solutions to the problem have been developed covering, for example, the use of time-gated spectroscopy and lanthanide millisecond emitters, delayed fluorescence, employment of long-wavelength absorbing/near I.R. emitters and large Stokes’ shift dyes. Certainly this latter solution is promising if a suitable dye can be identified where the structures of the emissive and ground state are very different. In a quest to identify and produce new highly fluorescent materials we have explored several different derivatives.

Biography
Andrew C Benniston completed his PhD from Warwick University in 1990 and Postdoctoral studies at the Universite Louis Pasteur (Strasbourg) and the University of Texas at Austin. He is Professor of Photonic Energy Sciences at Newcastle University. He has published more than 130 papers in major journals and is currently the Editor for the Journal of Analytical & Bioanalytical Techniques.

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