

The Fluorescence Applications in Biotechnology and Life Sciences Network
and
Science Industry Australia Association
invite you to a seminar on

“Luminescent Energy Transfer Immunoassays for the Rapid and Sensitive Detection of Analyte in Complex Matrices”

Dr Peter Banks

WHEN: Tuesday 19th February 2008, 2.00 – 3.00pm

WHERE: Building E7A Room 102, Macquarie University.

Abstract

PerkinElmer has a rich history in the development of labelling and detection technologies for immunoassays. The development of radioactive iodination of antibodies and their use in immunoassays provided Yalow with the Nobel Prize in Medicine in 1977. PerkinElmer was active in developing Radio-Immuno Assays (RIA) through the '70's and '80's after the exquisite sensitivity of Yalow's technique was recognized. The '80's marked the beginning of the transition from radio-luminescence to other forms of emission that were less energetic and far safer. Enzyme-Linked Immuno-Sorbent Assay (ELISA) methods based on colorimetric detection were adopted widely for many applications.

In the mid-'80's, PerkinElmer began developing fluorescence-based immunoassay methods that did not require enzymatic turnover of substrate for sensitivity. Labeling antibodies with proprietary lanthanide chelates allowed the use of time-resolved background reduction techniques to significantly improve signal to background ratios relative to other direct fluorescence methods.

The mid-'90's were the advent of immunoassay applications requiring many samples to be run - for example, high throughput small molecule drug screening (HTS). The multiple wash steps inherent to ELISA and other immuno-sorbent technologies were not conducive to high throughput operation managed by robotics and automation. PerkinElmer was at the forefront of HTS with its time-resolved fluorescence resonance energy transfer (TR-FRET) technology utilizing lanthanide chelates as energy donors and allophycocyanin as acceptors. This combination provided a homogeneous format where acceptor and donor partners are brought together by a binding event allowing FRET to occur with no need for washing steps.

PerkinElmer has developed additional technology in this decade based on luminescence energy transfer that is not limited by Förster radii. The technology, termed Luminescent Oxygen Channeling Immunoassay (LOCI) in the scientific literature, is bead based where donor beads

transfer energy to acceptor beads through singlet oxygen generated by irradiating donor beads with red light. The singlet oxygen generates a cascade of energy transfer within the acceptor bead that results in light emission of higher energy than excitation.

Peter Banks

Peter Banks received his PhD in Analytical Chemistry in 1992 from the University of British Columbia, Canada & then an NSERC post-doctoral fellowship for bioanalytical separations under Norman Dovichi at the University of Alberta. In 1994, he accepted an Assistant Professorship at Concordia University, Montreal in the Department of Chemistry and Biochemistry, developing methods for the trace detection of biomolecules, spanning from small neurotransmitters to proteins. In 1998, he joined Advanced Bioconcept, Ltd as R&D Leader developing fluorescence polarization binding assays for high throughput drug screening (HTS). NEN Life Sciences acquired Advanced Bioconcept and Banks was promoted to Fellow scientist. In 2000, NEN was acquired by PerkinElmer and Banks was promoted to Montreal Site Leader, responsible for HTS product line development and manufacture.

In 2002, Banks assumed the R&D leadership in Montreal, responsible for development of new HTS reagent products, including AlphaScreen and GPCR assays. He was appointed Chair of the Science Management Group in 2003, with responsibility for research & technology development across PerkinElmer Life and Analytical Sciences. In 2004, Banks accepted the position of R&D Portfolio Leader, responsible for the strategic direction and management of all research, technology and product development for the BioPharma business element within PerkinElmer and moved to Boston. In 2006, Banks assumed responsibilities for technology assessment and business development in the Molecular Medicine business element, located in Waltham, Massachusetts, with a focus primarily on biochemistry applications.

This is a free event

**RSVP to David Tayler, FABLES
By 18 February 2008**

Ph: 9850 9078

Email: dtayler@ics.mq.edu.au