Probes for Structural Recognition and Fluorescent Detection of Nucleic Acids

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Date: 4 January 2011, Tuesday
Time: 2.00pm to 3.00pm
Venue: Hilbert Space (PAP-02-02)
Host: Asst. Prof. Phan Anh Tuan

Abstract
The design of molecules that can recognize specific structures of nucleic acids is a research goal that is important both for understanding nucleic acid molecular recognition as well as for the development of new therapeutics and reagents for biotechnology. In recent years, increasing knowledge on the structure and dynamics of nucleic acids has led to the identification of a number of structural motifs as potential “drugable” sites. Amongst these are DNA quadruplexes which are tetrahelicoidal structures that could act as molecular switches of DNA-related biological functions. In addition, the detection and optical tracking of nucleic acids using specific fluorescent probes has become increasingly important for a variety of analytic and diagnostic applications. Along these two lines, we have developed a number of new structural and fluorescent probes based on various heterocyclic scaffolds; their design, recognition modes and fluorescent properties will be presented as well as the spectroscopic methods used for studying their interaction with DNA [1-5].