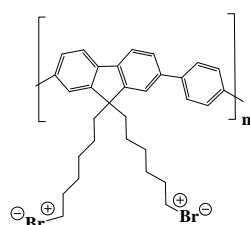


## Single nucleotide polymorphism detection using conjugated polymer/surfactant system and peptide nucleic acid and the myriad excitation quenching channels.

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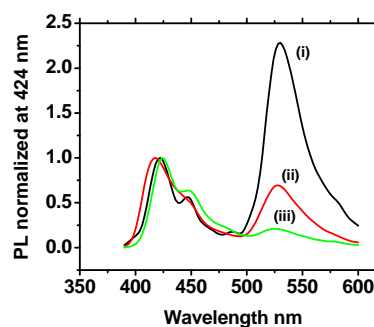
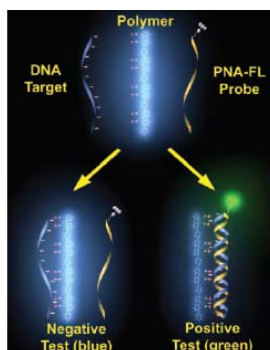
In this lecture we presented a method for detecting a target nucleic acid sequence in a strategy employing a combination of peptide nucleic acid (PNA) probes and optically amplifying conjugated polymer (CCP) in a simple, rapid, and sensitive manner [1]. The DNA sequence identification in real time and high sensitivity are of great scientific and economic interest [2]. Their applications include medical diagnostics, identification of genetic mutations, gene delivery monitoring, and specific genomic techniques. Here we are trying to use this methodology to detect and identified of SNPs is in the drug-resistant mutants of *ABL* portion of the *BCR-ABL* oncogene that reduce drug binding. A comparison between CCP/surfactant and CCP alone shows enhancement in the discrimination between mutant and wild type DNA by a factor of two. A discrimination factor of 70% and 92% were calculated for single and five bases mismatched mutants respectively when using CCP/surfactant [3-5]. The figures below showing the materials used in this assay, the scheme of detection and the photoluminescence signal of (i) Mutant DNA complementary (SNP), (ii) Wild DNA (single base mismatch) and (iii) non-complementary (five bases mismatched). Various quenching channels have been elucidated for this type of assay and it will be shown how both sensitivity and selectivity can greatly improved in this type of conjugated luminescent polymer based assay [6].



Poly[6'-bromohexylfluoren-2,7-diyl]-*alt*-co-(benzene-1,4-diyl)

PNA reader :  
Flu-OO-ATG-AAC-TCA-ATG-AT

DNA targets  
Mut-t, 5'-ATC ATT GAG TTC ATG ACC TAC GGG-3'  
Wild-t, 5'-ATC ACT GAG TTC ATG ACC TAC GGG-3'



### References:

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- [5] Al Attar H., Norden J. O'Brien S. and Monkman, A. *Biosens Bioelectron* **2008**, 23, (10), 1466-72.
- [6] Al Attar HA, Monkman AP, *Biomacromolecules*, 2009, 5, 1077