Digvijay Gahtory

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Project	PNA based sensors for SNP detection in malaria
Fields of interest	Surface chemistry, Synthetic organic chemistry, Biological chemistry
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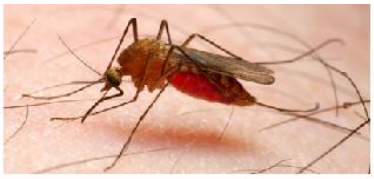
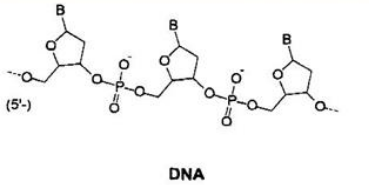
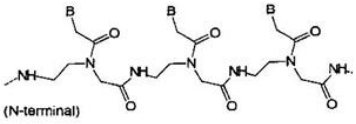
Introduction



Peptide nucleic acids (PNAs) are nucleic acid surrogates that consist of a deoxyribose phosphate backbone replaced by a pseudo peptide backbone. Forced intercalation (FIT)' peptide nucleic acids consist of a dye molecule incorporated as a DNA base replacement in the PNA chain. FIT-PNAs have the ability to selectively distinguish between a complementary and non-complementary DNA/RNA based on the increase/decrease in the fluorescence of the dye upon hybridization.The emergence of drug-resistant malaria cases worldwide is a major concern for the efforts to control human malaria. A major cause for such drug resistance is the emergence of single nucleotide polymorphisms (SNPs) in the P. falciparum genome. Detection of such SNPs is an important scientific challenge. FIT-PNAs offer an exciting avenue in this regard. Their ability to selectively distinguish match v/s mismatch upon hybridization with a DNA/RNA sequence provides an interesting approach for DNA/RNA bio-sensing and SNP detection.



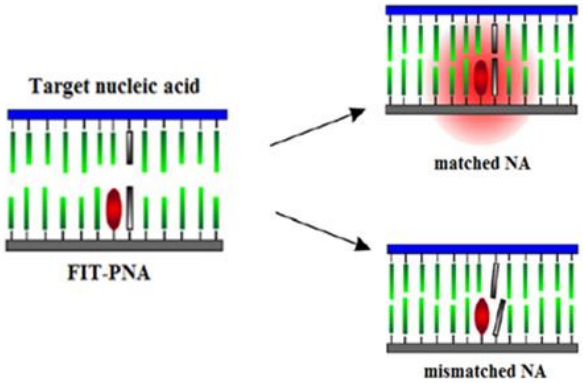
DNA

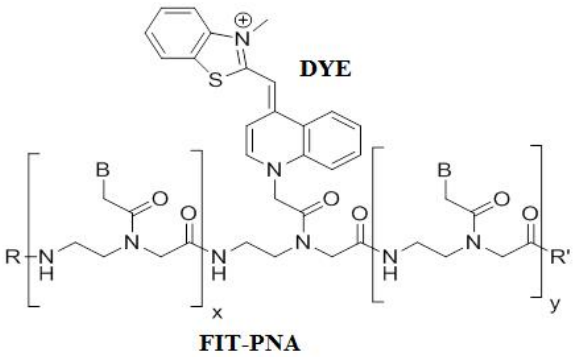


PNA

Goal

To develop a ON/OFF sensor for single nucleotide polymorphism detection in malaria strains based on FIT-PNA.





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