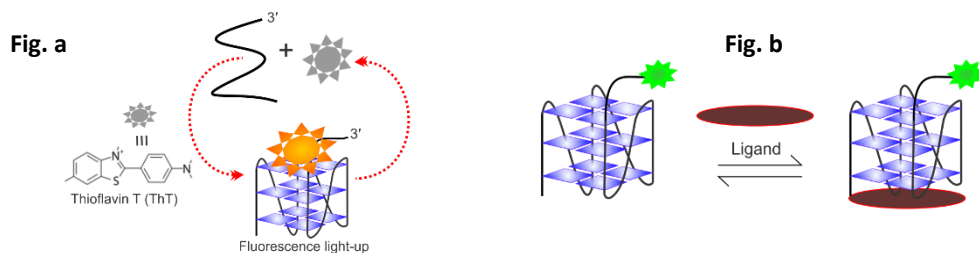


Research Interests

- Bioanalytical chemistry, chemical separations, and development of biosensors.
- Develop high-throughput methods for probing noncanonical nucleic acid secondary structures especially G-quadruplexes (Fig. a) and i-motifs.
- Design nucleic acid-based biosensors for biomarkers and probe how nucleic acid structures are modulated by proteins and drug molecules (Fig. b).
- Enzyme kinetics and the mechanisms by which helicase proteins manipulate nucleic acid secondary structures.

Nucleic acid sequences fold into diverse unique secondary structure conformations under different conditions. Single-stranded DNA (ssDNA) regions consisting of at least four closely spaced runs of three or more consecutive guanines or cytosines strongly tend to fold into stable G-quadruplex (G4) or i-motif structures respectively. These unique structures have been implicated in regulating many important biological processes.



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