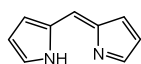


Talkative Molecules: Design and Synthesis of Functional Bodipy Compounds

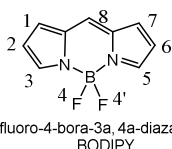
Neelam Shivran¹, S. Chattopadhyay²

¹Indian Institute of Science Education and Research, Pune, India, ²Bhabha Atomic Research Centre,, Mumbai, India

Among many dipyrin complexes the difluoro-boraindacene family (4,4-difluoro-4-bora-3a,4a-diaza-s-indacene, Bodipy) has gained recognition as one of the more versatile fluorophores since it has emerged as a frontrunner for lasing, imaging, sensing and opto-electronic applications. The basic Bodipy unit can be readily functionalized and shift the absorption maxima over a wide spectral range. The major objective of our study is to develop Bodipy-based functional materials for various applications such as photostable laser dyes, Bodipy based organoelectronic materials and photosensitizer for Photo-Dynamic Therapy (PDT). This warrants synthetic modifications of the Bodipy core, available commercially or synthesized in-house so as to impart the desirable attributes to the newly developed molecules/assemblies. To this end, various sites of the Bodipy cores viz. different positions of the dipyrrole moieties and/ or the *meso*-position are innovatively used for introduction of different functional groups. Several new Bodipy-O-glycosides were synthesized by incorporating the glucose unit at meso-phenol or C-3/C-5 hydrostyryl moieties. Subsequent attachment of a glucose unit to the phenolic function of the conjugated dyes furnished the photosensitizers. All the compounds showed impressive good photo-toxicity to the human lung cancer A549 cells, without any dark toxicity due to their accumulation in cytoplasm. The efficacy of the protocols in designing new molecules and the potential functional applications along with their biomedical usefulness will be emphasized in the talk.



Dipyrromethene (dipyrin)



4,4-difluoro-4-bora-3a,4a-diaza-s-indacene
BODIPY

References:

1. Loudet, A.; Burgess, K. *Chem. Rev.* **2007**, *107*, 4891.
2. Ulrich, G.; Ziessel, R.; Harriman, A. *Angew. Chem. Int. Ed.* **2008**, *47*, 1184.