Mechanosensitive Membrane Probes and Beyond

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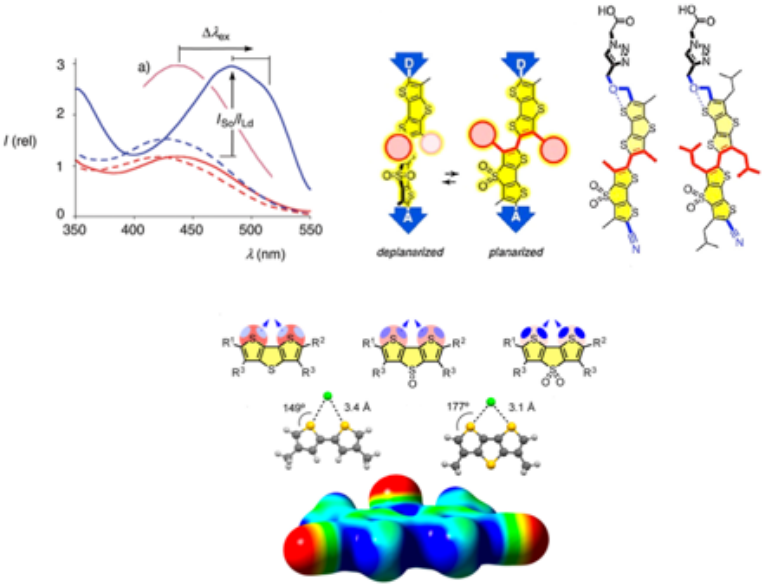
To understand the behaviour and the features of biological cellular membranes, mechanosensitive[1] fluorescent “flipper” probes have been developed. Combining the chromophore polarization and ground state planarization is the key to determine and visualize the lateral organization.[2] Improvement on chemical stability have been fully achieved through head group engineering using copper-catalyzed alkyne–azide cycloaddition (CuAAC) approach in a way to have probes ready for use in biology.[3] Introducing “bulky” lateral chains on dithienothiophene (DTT) moyeties that affects the molecule’s twisted state, such as isobutyl groups, strongly hinders the planarization in the first excited state producing a probe that fails to respond to changes in membrane order.[4] However the new more effective synthetic approach introduced, has been highly useful to develop DTT units as privileged motif to study anion transport[5] and catalysis[6] with chalcogen bonding. Expanding the length of the current flipper to “trimer” and “tetramer” units is now in progress with the aim to create a new generation of fluorescent membrane probes.



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