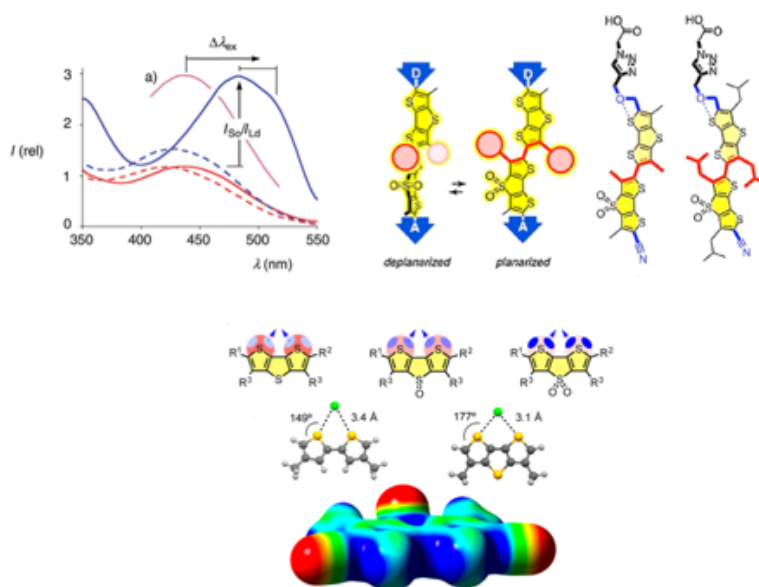


## Mechanosensitive Membrane Probes and Beyond

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To understand the behaviour and the features of biological cellular membranes, mechanosensitive<sup>1</sup> fluorescent “flipper” probes have been developed. Combining the chromophore polarization and ground state planarization is the key to determine and visualize the lateral organization.<sup>2</sup> 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.<sup>3</sup> Introducing “bulky” lateral chains on dithienothiophene (DTT) moieties 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.<sup>4</sup> However the new more effective synthetic approach introduced, has been highly useful to develop DTT units as privileged motif to study anion transport<sup>5</sup> and catalysis<sup>6</sup> 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.



[1] Dal Molin, M.; Verolet, Q.; Soleimanpour S.; Matile, S. *Chem. Eur. J.* **2015**, *21*, 6012–6021.

[2] Dal Molin, M.; Verolet, Q.; Colom, A.; Letrun, R.; Derivery, E.; Gonzalez-Gaitan, M.; Vauthey, E.; Roux, A.; Sakai, N.; Matile, S. *J. Am. Chem. Soc.* **2015**, *137*, 568–571.

[3] Soleimanpour, S.; Colom, A.; Derivery, E.; Gonzalez-Gaitan, M.; Roux, A.; Sakai, N.; Matile, S. *Chem. Commun.* **2016**, *52*, 14450–14453.

[4] Macchione, M.; Chuard, N.; Sakai, N.; Matile, S. *ChemPlusChem* **2017**, DOI: 10.1002/cplu.201600634.

[5] Benz, S.; Macchione, M.; Verolet, Q.; Mareda, J.; Sakai, N.; Matile, S. *J. Am. Chem. Soc.* **2016**, *138*, 9093–9096.

[6] Benz, S.; López-Andarias, J.; Mareda, J.; Sakai, N.; Matile, S. *Angew. Chem. Int. Ed.* **2017**, *56*, 812–815.