Foldamers as Devices for the Transmission of Binding Information

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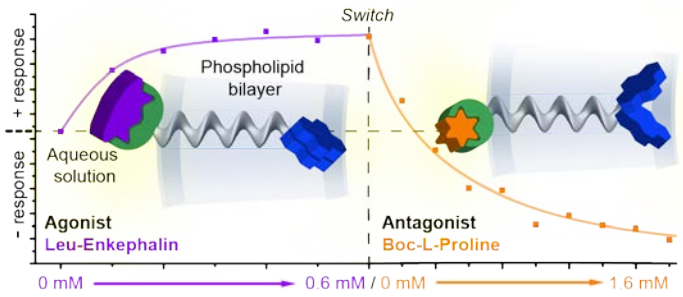
Molecular devices that can reversibly bind messenger ligands and relay this information into compartments will be a key part of programmed manufacturing at the nanoscale. Such devices can be found in nature, for example the G protein-coupled receptors, where they are used to transmit external signals to the cell interior.

Foldamers (folded oligomers) comprising α-aminoisobutyric acid (Aib) have promise as information transfer devices. These oligomers, which fold into 3_{10} helices, have a conformation that is very sensitive to binding events at their N-terminus. Initial studies showed ligand binding in solution could trigger a conformational switch that is relayed several nanometres along the foldamer to a reporter group at the far end.[1] Then light-switchable Aib foldamers were shown to relay photochemical information over similar distances within phospholipid bilayers.[2] Recently we combined both features, creating a foldamer that transmits binding information several nanometres into a bilayer.[3],[4] We now hope to develop this prototype into a synthetic device for molecular communication between the exterior and interior of artificial vesicles.



References

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