Title: **Nanoscale Engineering of DNA-Based Amphiphiles for the Fabrication of Surface Addressable Nano-Bio Materials with Defined Morphology**

Abstract

Precise positioning of structural motifs to achieve a specific function is one of the prime concerns in nanotechnology.[1] This can be achieved by imparting surface addressability to the nanostructures. DNA nanotechnology utilises information storage ability of DNA to fabricate complex nanostructures with surface addressability. However, the integration of functional moieties into these structures requires complex redesigning of structural motif. Self-assembly of DNA based amphiphiles can be used as an alternative bottom-up approach to attain this goal. The talk will be focused on the design, synthesis and self-assembly of DNA-based amphiphiles and tuning its self-assembled morphology by controlling π-π stacking interaction in the hydrophobic segment.[2-3] Afterwards, by exploiting the directional interactions of peptides, the orientation of DNA-peptide amphiphile in a self-assembled structure could be assigned to generate Janus nanosheets and the utility of these structures as a template for the organisation of functional moieties will be discussed.[4] Towards the end of the talk, future research plan will be presented. Major objective of the proposal is the DNA-directed assembly of DNA-encoded allosteric proteins to fabricate functional nanostructures of biological as well as technological importance. DNA and protein being two important information-rich natural systems, the combination of both will provide multiple handles for nanoscale engineering.

References

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