AMPHIPHILE-BASED INTERFACES AND SELF-ASSEMBLED NANOMATERIALS FOR DIVERSE APPLICATIONS

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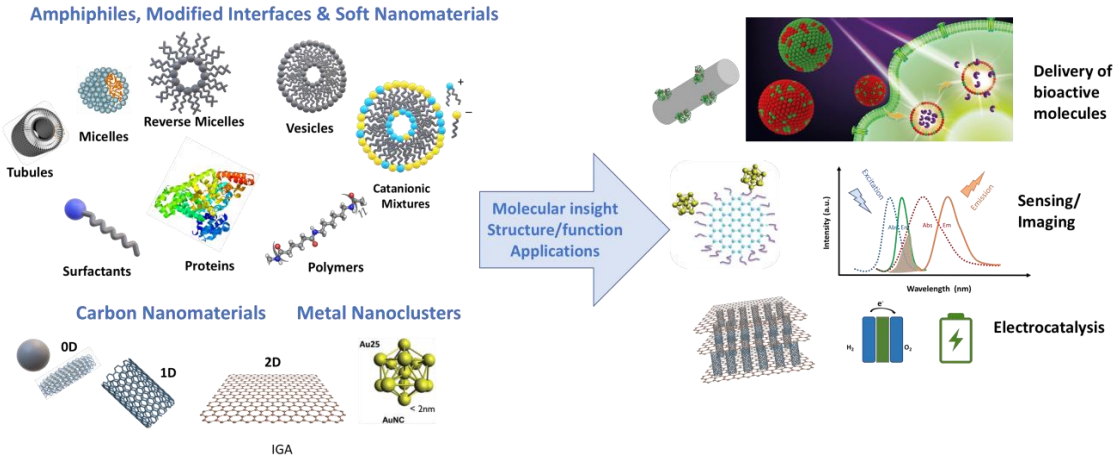
The research work in our group encompasses the development of amphiphile-based nanostructures, modified interfaces and colloidal materials, alongside surfactant-assisted assembly of novel hybrid nanomaterials, for different functionalities and applications. In the past few years, we have mainly focused on the assembly, in-depth characterization, molecular-level understanding and applications in the following domains:

- Versatile, biocompatible catanionic vesicles for efficient delivery of bioactive molecules [1];
- Temperature- and pH-responsive nanostructures for controlled molecular delivery [2];
- Dispersion and noncovalent functionalization of carbon nanotubes and 2D nanomaterials [3-5];
- Structure/function relationships on lyotropic [6,7] and thermotropic [8] liquid crystals;
- Development of hierarchical 1D/2D nanocomposites for advanced applications.

Besides these lines of research, we have introduced more recently new challenges in our group:

- Development of gold-graphene quantum dots for bioimaging and sensing;
- Development of photo-responsive flavylium-based colloidal systems for gene/drug delivery;
- Cellulose-based nanotechnologies from textile waste: a circular approach.



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