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Research Interests

Our research interests include the synthesis and biomedical application of functional polymers and the biomimetic or bio-inspired synthesis of inorganic nanomaterials. We currently focused on the synthesis and self-assembly of amphiphilic polypeptides and glycopeptides. These self-assembled structures can have potential applications in biomedical field such as drug delivery and encapsulation. They possess essential structures and functions of proteins that can mimic the biological activities and supramolecular structures of natural proteins. For example, the biofunctionality exhibited by the peptide and saccharide segments can be introduced to the self-assembled structures. The size and morphology of the self-assembled structures can be tuned by the chain conformation of polypeptide segments. We are also interested in the biomimetic or bio-inspired synthesis of inorganic nanomaterials. Peptide secondary conformation or peptide-based assemblies were exploited as templates and/or mediating agents for directed growth of metal nanoparticles and oxide mineralization. For example, mesoporous silicas with well-defined pore architecture can be synthesized by using peptide secondary conformation such as α -helix and β -sheet as templates. These materials synthesized via biomimetic approach hold promise applications in areas such as separation, catalysis, and molecular sieving.

Representative Publications

Huang, Y.-F.; Lu, S.-C.; Huang, Y.-C.; Jan, J.-S.* *Small* **2014**, 10, 1939-1944.

Chen, B.-Y.; Huang, Y.-F.; Huang, Y.-C.; Wen, T.-C.; Jan, J.-S.* *ACS Macro Lett.* **2014**, 3, 220-223.

Lee, Y.-L.; Lin, T.-X.; Hsu, F.-M.; Jan, J.-S.* *Nanoscale*, **2016**, 8, 2367-2377.

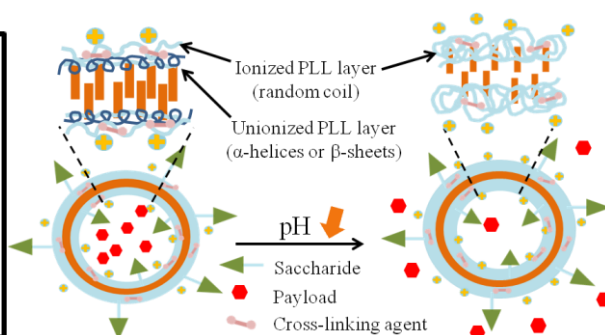
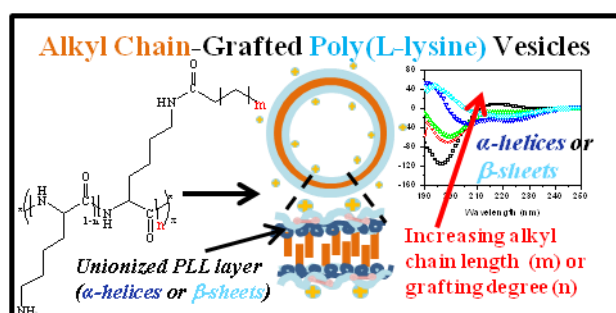
Jan, J.-S.*; Chen, P.-S.; Hsieh, P.-L.; Chen, B.-Y. *ACS Appl. Mater. Interfaces* **2012**, 4, 6865-6874.

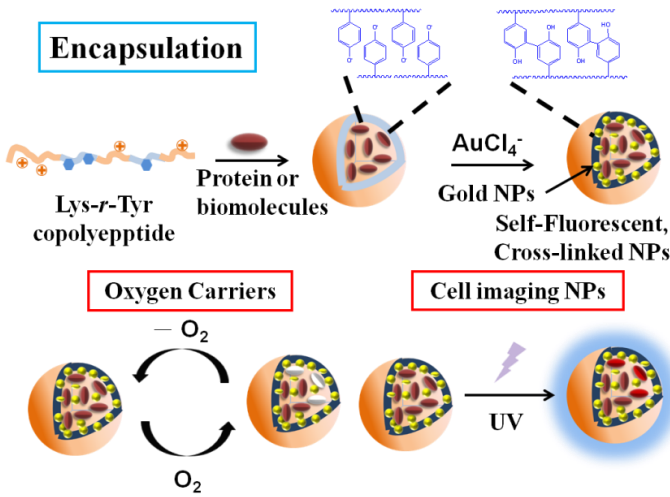
Wang, S. S.-S.; How, S.-C.; Chen, Y.-D.; Tsai, Y.-H.; Jan, J.-S.* *J. Mater. Chem. B* **2015**, 3, 5220-5231.

Hsieh, Y.-H.; Hsiao, Y.-T.; Jan, J.-S.* *Soft Matter* **2014**, 10, 9568-9576.

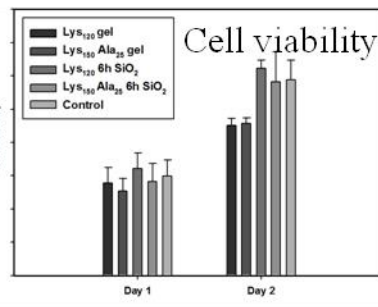
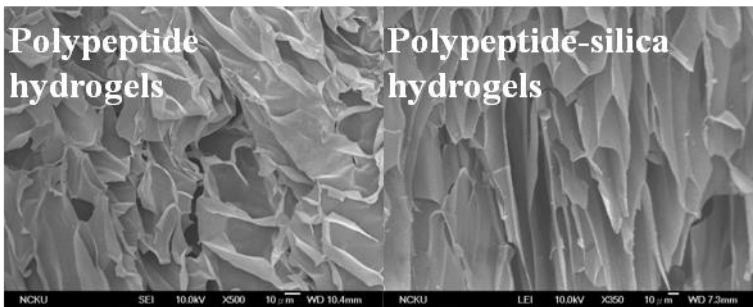
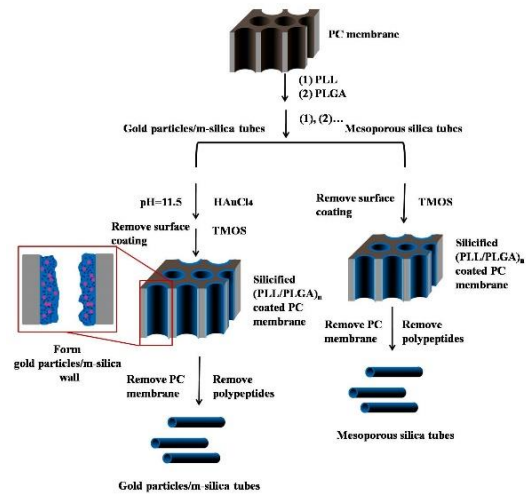
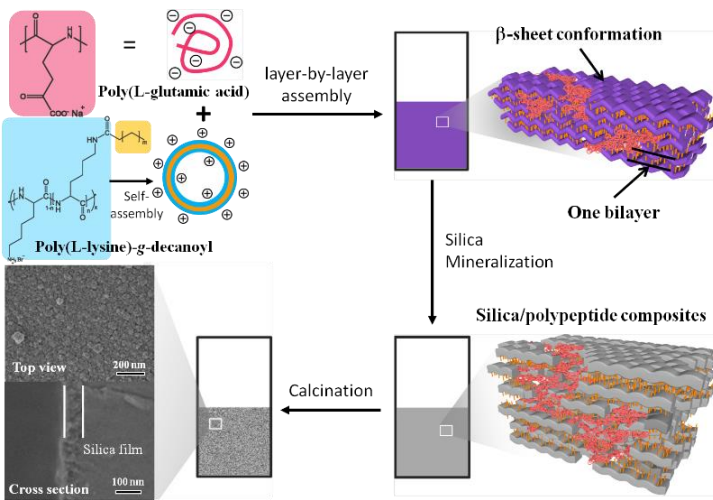
Huang, Y.-C.; Jan, J.-S.* *Polymer* **2014**, 55, 540-549.

Synthesis and self-assembly of amphiphilic polypeptides/glycopeptides and their biomedical applications as carriers, encapsulants, or scaffolds.





Using peptide secondary conformation or peptide-based assemblies as templates and/or mediating agents for directed growth of metal nanoparticles and oxide mineralization.



Study of the chain conformation of polymers

