

Science Bridges China Research Profile

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SUMMARY OF MY RELEVANT RESEARCH AREAS:

*Surface and interface of polymer ;
Interactions between polymer surface and biomacromolecules*

高分子材料的表面与界面；
聚合物表面与生物大分子的相互作用。

Primary Research interests:

The microstructure of the material surface influences the adhesive behavior of protein/cell on the surface. However, the mechanism of adhesion of protein/cell and control of microstructure on adhesion are unclear until now. We choose a single micro/nanofiber as a model to study the adhesion between polymer surface and protein/cell. The microstructure is controlled by adjusting surface topological structure, introduction of chemical groups and biomacromolecules. The adhesion and adhesion energy are directly measured by atomic force microscope to investigate the adhesive behavior at the molecular level. In addition, the adhesion between polymer film and protein/cell is compared with that between micro/nanofiber and protein/cell, which facilitates establishing the relationship between microstructure and adhesion. This proposal will not only pave the way to study the adhesion between protein/cell and materials to explore the nature of adhesion, but also provide theoretical and practical guidance for designing the surface with smart and oriented adhesion.

Topics in which you would like to develop collaborative research:

Please indicate here research areas for which you would like to find partners to undertake joint research.

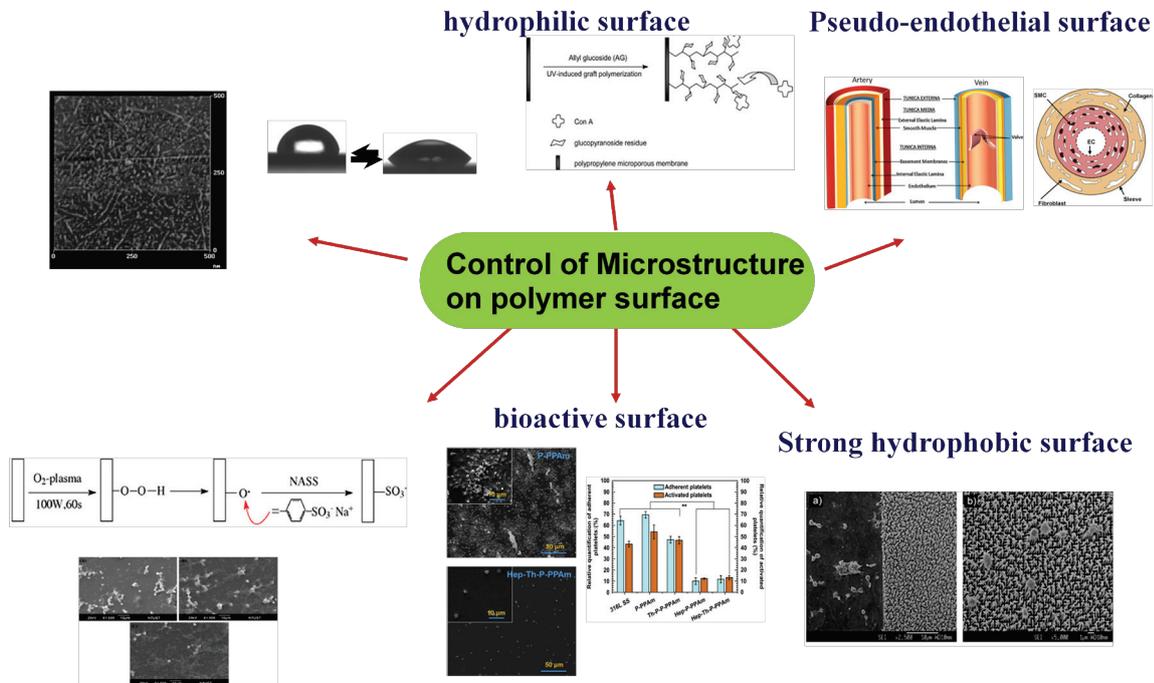
Biochemistry, cell biology, developmental biology and protein science.

Relevant existing collaborations (academic/clinical/commercial) inside or outside China.

Include here any relevant collaborations you have

Italy, Synthesis and characterization of novel biomedical polymers

Relevant graphics, figures, pictures:



Interaction between polymer surface and protein/cell

Publications and other outputs relevant to your interest in this programme (up to 5)

1. **Shi, Q.;** Wong, S.-C.; Ye, W.; Hou, J.; Zhao, J.; Yin, J. " Mechanism of adhesion between polymer fibers at nanoscale contacts " *Langmuir*, **2012**, 28 :4663
2. **Shi, Q.;** Wan, K.-T.; Wong, S.-C.; Chen, P.; Blackledge, T.A. "Do Electrospun Polymer Fibers Stick?" *Langmuir*, **2010**, 26 :14188
3. **Shi, Q.;** Zhao, J.; Stagnaro, P.; Yang, H.; Luan, S.; Yin, J. Biocompatible polypropylene prepared by a combination of melt grafting and surface restructuring, *J. Appl. Polym. Sci.* **2012**, 126(3): 929–938