

Science Bridges China Research Profile

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SUMMARY OF MY RELEVANT RESEARCH AREAS:

Colloid-polymer mixture structure and dynamics; hybrid materials for biomedical applications; in-situ structural characterisation with advanced scattering techniques

胶体-高分子混合体系的结构与动态行为；杂化生物医用材料；先进散射技术原位结构表征

Primary Research interests:

To understand chemistry-structure-property relationships with the help of various in situ characterization techniques. Through studying the interactions between polymer and colloid at the nanoscale level, to explore the specific/non-specific interaction between biomacromolecules and colloidal particles thus control the destiny of polymeric carriers in situ and to design better hybrid/composite materials with improved bioactivity and mechanical strength. With the insight of local chemical structural information, to optimize the overall degradation rate of materials for tissue engineering.

Topics in which you would like to develop collaborative research:

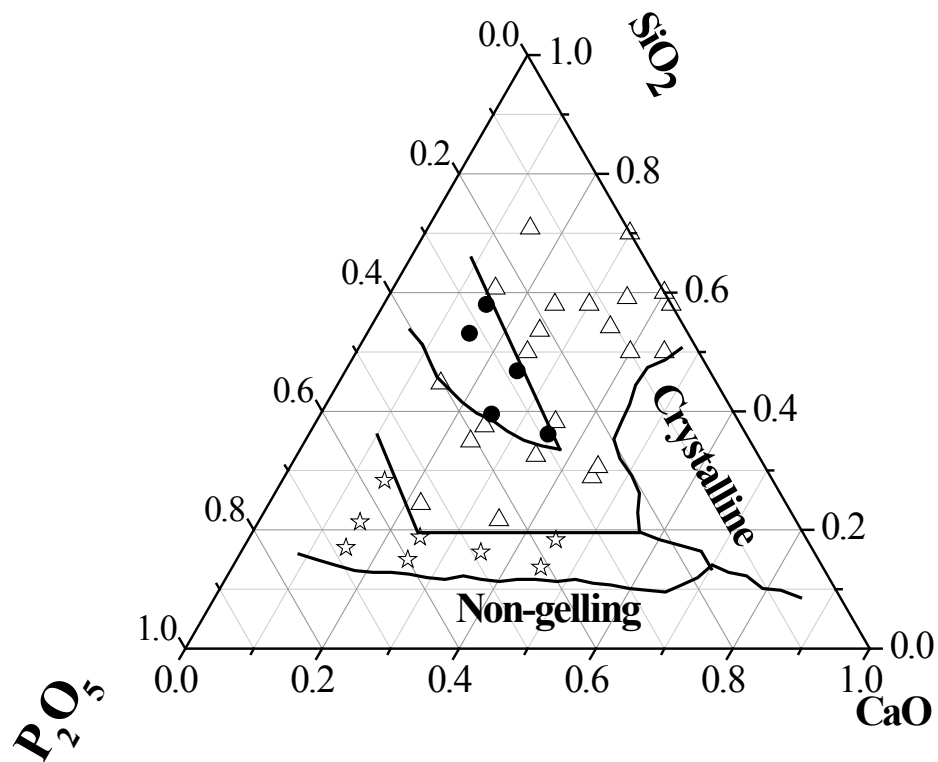
Hybrid materials for bone regeneration.
In-situ structural characterization

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

The third hospital of Peking University.

Relevant graphics, figures, pictures:

We have developed a method to prepare bioactive glasses over a broader compositional range as shown below.



Compositional range of the bioactive CaO-SiO₂-P₂O₅ gel-glasses.

Δ: HA formation; ●: no HA formation; ☆: dissolution

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

1. A. Li, D. Qiu, Phytic acid derived bioactive CaO-P₂O₅-SiO₂ gel-glasses, DOI: 10.1007/s10856-011-4464-7.
2. A. Li, D. Wang, J. Xiang, R.J. Newport, M.X. Reinholdt, P.H. Mutin, D. Vantelon, C. Bonhomme, M.E. Smith, D. Laurencin, D. Qiu, Insights into new calcium phosphosilicate xerogels using an advanced characterization methodology, *Journal of Non-Crystalline Solids*, 2011, 357, 3538-3555.
3. Z. Bai, Y. Xie, C. Chen, T. Cosgrove, D. Qiu, A small-angle neutron scattering study of poly(ethylene oxide) microstructure in aqueous poly(styrenesulfonate sodium) solutions, *Journal of Colloid and Interface Science*, 2011, 358, 226-229.