

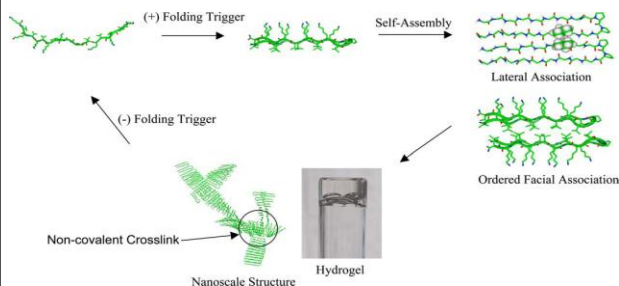
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PEPTIDES AS BUILDING BLOCKS FOR HYBRID NANOMATERIALS

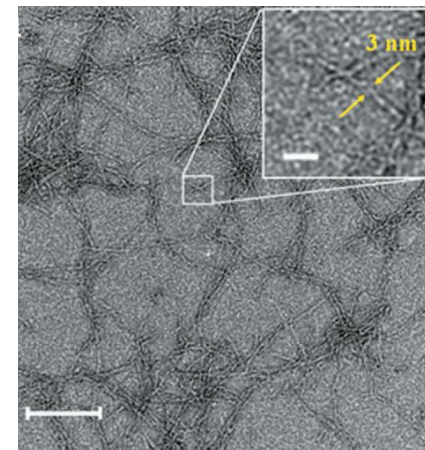
- ◆ Peptides adopt secondary, tertiary and quaternary conformations in solution that assemble into hierarchical nano-scale architectures.
- ◆ Their nanostructure, gelation kinetics and elastic modulus depend on the peptide's primary sequence and can thus be conveniently tuned by changing the primary sequence.
- ◆ Functionality may be engineered at specific sites due to ease and versatility of the solid phase synthesis process
- ◆ Simple solution self-assembly construction methods

PEPTIDE SELF ASSEMBLY MECHANISM



Schneider *et al.*, JACS, 2002
Pochan *et al.*, JACS, 2003
Ozbas *et al.*, Macro, 2004
Ozbas *et al.*, PRL, 2004
Kretsinger *et al.*, Biomaterials, 2005

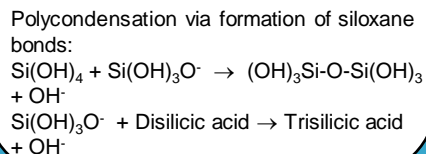
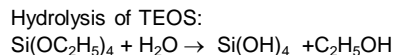
PEPTIDE FIBRIL MORPHOLOGY



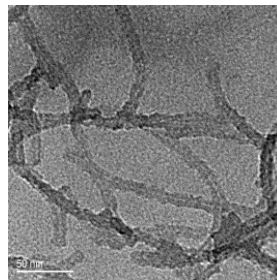
Negatively stained TEM image of peptide fibrils

SOL GEL CHEMISTRY SCHEME

Tetraethyl orthosilicate (TEOS) is used to coat the peptide fibrils with a thin layer of silica that proceeds via the following two steps.

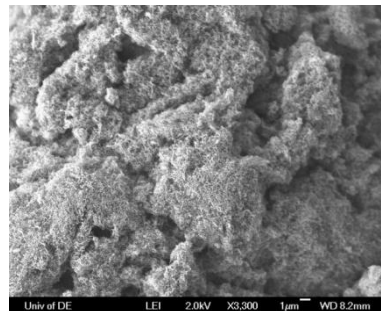


SILICIFIED PEPTIDE FIBRIL NANOSTRUCTURE



TEM image of silicified peptide fibrils showing light peptide core and dark silica shell

SILICIFIED PEPTIDE FIBRIL MICROSTRUCTURE



SEM image of silicified peptide fibrils

ACKNOWLEDGEMENTS

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