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Professional experience

Massachusetts Institute of Technology
1998- Associate Director, Center for Biomedical Engineering
1997- Principal Research Scientist
1992-1996 Research Scientist, Department of Biology
1988-1991 American Cancer Society Postdoctoral Fellow, Structural & Molecular Biology
1988 Ph.D. Biochemistry & Molecular Biology, University of California at Santa Barbara
1980 B.S. Biochemistry, Sichuan University, China

Brief Biography

Dr. Shuguang Zhang is in the Center for Biomedical Engineering at the Massachusetts Institute of Technology. He received his Ph.D. in genetics, biochemistry and molecular biology from *University of California at Santa Barbara* (UCSB). He was an American Cancer Society Fellow at MIT. He worked on structure of DNA and RNA as well as molecular genetics. He serendipitously discovered a self-assembling peptide system while working in molecular and structural biology with Alexander Rich at MIT. This discovery was selected to be one of the 15 research achievements over last quarter century at MIT in 1994. He invented various self-assembling peptide systems to develop new classes of biological materials including peptide scaffolds for tissue engineering, biological surface engineering, molecular switches, and lipid-like peptide surfactants for stabilizing membrane proteins and their complexes. He also tries to gain understanding of a class of protein conformational diseases, including Alzheimer's, Parkinson's and the prion diseases (mad cow disease). He holds 7 US patents and 15 additional pending patents on various self-assembling peptide systems. He also established 2 biotech companies to commercialize designer self-assembling peptide nanomaterials, 3DMatirx and NZ^3, both in USA.

Dr. Zhang is an honorary professor and a Distinguished Changjiang Scholar at Sichuan University in Chengdu, China. He is also a visiting professor of Qinghua University, of Chinese Academy of Medical Science in Beijing and of China University of Petroleum in Qingdao. He is member of American Association of Advancement for Science, American Society of Biochemistry and molecular Biology, the Human Genome Organization Americas, the Protein Society, New York Academy of Sciences, International Society for the Study of Origin of Life, and the honorary society of Sigma Xi. He is a 2003 Fellow of Japan Society for Promotion of Science (JSPS fellow) and a 2005 Fellow of Japan Advancement for Medical Instrument. His work on designer peptide scaffold won 2004 R&D100 award. His and his colleagues' work on biosolar energy was selected to be the Top 100 Science Stories in 2004 by *Discover* Magazine. His team's work on biosolar nanodevice was selected to be one of the 10 finalists of the *2005 Saatchi & Saatchi Award for World Changing Ideas*. He is one of the 2006 John Simon Guggenheim Fellows. He is a recipient of 2006 Wilhelm Exner Medal of Austria.

Selected Publications (from over 100)

Zhang, S., *et al.* (1993) Spontaneous assembly of a self-complementary oligopeptide to form a stable macroscopic membrane. *Proceedings of National Academy of Science USA* **90**, 3334-3338.

Zhang, S., Holmes, T., DiPersio, M., Hynes, R.O., Su, X. & Rich, A. (1995) Self-complementary oligopeptide matrices support mammalian cell attachment. *Biomaterials* **16**, 1385-1393.

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Zhang, S., *et al.* (1999) Biological surface engineering: A simple system for cell pattern formation *Biomaterials* **20**, 1213-1220.

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Altman, M., Lee, P., Rich, A. & Zhang, S. (2000) Conformational behavior of ionic self-complementary peptides *Protein Science* **9** 1095-1105.

Vauthey, S. Santoso, S., Gong, H., Watson, N. & Zhang, S. (2002) Molecular self-assembly of surfactant-like peptides to form nanotubes and nanovesicles. *Proc. Natl. Acad. Sci. USA* **99**, 5355-5360.

Santoso, S., Hwang, W., Hartman, H. & Zhang, S. (2002) Self-assembly of surfactant-like peptides with variable glycine tails to form nanotubes and nanovesicles. *Nano Letters* **2**, 687-691.

von Maltzahn, G., Vauthey, S., Santoso, S. & Zhang, S. (2003) Positively charged surfactant-like peptides self-assemble into nanostructures. *Langmuir* **19**, 4332-4337.

Hamad-Schifferli, K. *et al* (2002) Remote electronic control of DNA hybridization through inductive heating of an attached metal nanocrystal. *Nature* **415**, 152-155.

Zhang, S. Marini, D. & Hwang, W., Santoso, S. (2002) Design nano biological materials through self-assembly of peptide & proteins. *Current opinion in Chemistry Biology* **6**, 865-871.

Hwang, W., Marini, D, Kamm, R & Zhang, S. (2003) Supramolecular structure of helical ribbons self-assembled from a beta-sheet peptide. *Journal of Chemical Physics* **118**, 389-397.

Zhang, S. (2003) A questioning mind. *Nature* (Lifeline interview) **421**, 581.

Zhang, S. (2003) More Cinderella than ugly sister. *Nature Review Genetics*, **4,** 243.

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Zhang, S. (2003) Building from bottom-up. *Materials Today* **6**, 20-27.

Zhang, S. (2004) Wet or let die. *Nature Materials* **3**, 7-8.

Sung, *et al*. (2004) Synthesis of monofunctionalized gold nanoparticles by F-moc solid-phase reactions. *Journal of American Chemical Society* **126**, 5064-5065.

Das, *et al*. (2004) Integration of photosynthetic protein molecular complexes in solid-state electronic device. *Nano Letters,* **4,** 1079-1083.

Zhang, S. (2004) Beyond the Petri Dish. *Nature Biotechnology* **22**, 151-152.

Zhao, X & Zhang, S. (2004) Building from bottom up: Fabrication of molecular materials using peptide construction motifs. *Trends in Biotechnology* **22**, 470-476.

Carr, P. *et al*. (2004) Protein-Mediated Error Correction for de Novo DNA Synthesis. *Nucleic Acids Res*.**32**, eI62.

Kiley, P. Zhao, X., Vaughn, M., Baldo, M. Bruce, B.D. & Zhang, S. (2005) Designed short peptide detergents stabilize the structure of photosystem I membrane protein complex. *PLoS Biology* **3,** 1181-1186.

Yokoi, H., Kinoshita, T. & Zhang, S. (2005) Dynamic reassembly of peptide RADA16 nanofiber scaffold. *Proceedings of National Academy of Science USA* **102,** 8414-8419.

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Zhang, S., Gelain, F. & Zhao, X. (2005) Designer self-assembling peptide nanofiber scaffolds for 3-D tissue cell cultures. *Seminars in Cancer Biology* **15**, 413-420**.**

Zhang, S. Yokoi, H. & Zhao, X (2005) Molecular Design of Biological and Nano-Materials in *Biomimetics: Mimicking & Inspiration of Biology*. CRC Press 229-242.

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