Shao Qin YAO

Post-doc (Scripps Res. Inst. & UC Berkeley); PhD (Purdue U.); BSc (Ohio State U.)

Associate Professor

Department of Chemistry & Department of Biological Sciences

National University of Singapore

3 Science Drive 3

Singapore 117543 Phone: 6516 2925

E-mail : chmyaosq@nus.edu.sg; http://staff.science.nus.edu.sg/~syao

MAJOR RESEARCH INTERESTS

Research program in my group is directed towards the interface of organic chemistry and molecular biology/cell biology-namely chemical biology and chemical genetics. In the simplest term, by utilizing our expertise in both Chemistry and Molecular Biology, we are interested in designing, identifying, synthesizing and studying biologically interesting molecules, which include small molecules and natural products, peptides and their analogs, as well as natural and unnatural proteins. Current research interests in the group centre around the following areas:

1. Combinatorial Chemistry & Organic Synthesis.
    - Solid-phase reactions
    - Combinatorial antibiotic libraries
    - Combinatorial DNA-binding peptides
    - Combinatorial natural product analogs
2. Proteomics/Functional Genomics & Biochips
    - Developing next-generation microarrays based on small molecules, peptide and proteins
    - Developing new strategies for large-scale proteomics
    - Microarrays for disease diagnostics
3. Peptide and Protein Engineering
    - Protein- and peptide-based biosensors
    - In vitro evolution of proteins using Ribosome Display, Phage Display and other techniques
4. Bioimaging
    - Developing novel strategies for biomolecule labeling in living cells
    - Developing novel fluorescent molecules
    - Developing strategies for transporting macromolecules across cell membranes

RECENT REPRESENTATIVE PUBLICATIONS

1. Chattopadhaya, S.; Tan, L.P.; Yao, S.Q.* "Strategies for the Site-Specific Biotinylation of Proteins using *in vitro*, *in vivo* and cell-free systems - Towards Functional Protein Microarrays", *Nature Protocols*, **2006**, *1*, 2386-2398.
2. Wang, J.; Uttamchandani, M.; Li, J.; Hu, M.; Yao, S.Q.* "Rapid Assembly of Matrix Metalloprotease Inhibitors Using Click Chemistry", *Org. Lett.*, **2006**, *8*, 3821-3824.
3. Wang, J.; Uttamchandani, M.; Li, J.; Hu, M.; Yao, S.Q.* "Click" Synthesis of Small Molecule Probes for Activity-Based Fingerprinting of Matrix Metalloproteases", *Chem. Commun.*, **2006**, 3783-3785.
4. Hu, Y.; Chen, G.Y.J.; Yao, S.Q.* "Activity-based high-throughput screening of enzymes using DNA microarray", *Angew. Chem. Intl. Ed.* **2005**, *44*, 1048-1053.
5. Uttamchandani, M.; Walsh, D.P.; Yao, S.Q.*; Chang, Y.T. "Small molecule microarrays – recent advances and applications", *Curr. Opin. Chem. Biol.*, **2005**, *9*, 4-13.
6. Chen, G.Y.J.; Yao, S.Q.* "Lighting the cancer cells with the 'dots'", *Lancet*, **2004**, *364*, 2001-2003.
7. Uttamchandani, M.; Walsh, D.P.; Khersonsky, S.M.; Huang, X.; Yao, S.Q.*; Chang, Y.T. "Microarrays of tagged combinatorial triazine libraries in the discovery of small molecule ligands of Human IgG", *J. Comb. Chem.* **2004**, *6*, 862-868.
8. Chan, E.W.S.; Chattopadhaya, S.; Panicker, R.C.; Huang, X.; Yao, S.Q.* "Developing photo-active affinity probes for proteomic profiling: hydroxamate-based probes for metalloproteases", *J. Am. Chem. Soc.* **2004**, *126*, 14435-14446.
9. Lue, R.Y.P., Chen, G.Y.J., Hu, Y., Zhu, Q., Yao, S.Q.* "Versatile protein biotinylation strategies for potential high-throughput proteomics", *J. Am. Chem. Soc.* **2004**, *126*, 1055-1062.