

Jian Liu

610 Carlyle Lake
Decatur, GA 30033

Phone (office): (404)727-9611
(cell): (650)451-2852
E-mail: jliu44@emory.edu

EDUCATION

- Ph. D.** Chemistry; *Specialty in biochemical analysis and microfluidics* 2006
California Institute of Technology, Pasadena, CA
- M. Sc.** Polymer Chemistry and Physics 2000
Fudan University, Shanghai, China
- B. Sc.** Materials Chemistry 1997
Fudan University, Shanghai, China

RESEARCH EXPERIENCE

Emory University, GA (Advisor: S.M. Nie) 2006~ present

- Development of nano technologies for diagnostic and prognostic cancer imaging.
 - Reliable diagnosis with multiplexed Qdots staining for ambiguous tissue specimens.
 - Prognostic studies correlating profiles of cancer biomarkers with clinic outcomes.

Caltech/Stanford, CA (Advisor: S. Quake) 2000 ~ 2006

- Development of new high-throughput platforms for gene identification and gene expression studies. Fabrication of microfluidic devices using Multilayer Soft Lithography.
 - Quantitative profiling of Lola gene expression in Drosophila neural development.
 - Designed a microfluidic chaotic mixer to accelerate kinetics of DNA microarrays.
 - Devised a matrix device to solve the macroscopic/microfluidic sample-loading problem; realized impressive economies of scale in reagent consumption; reduced the complexity of pipetting operations dramatically.
 - Miniaturized Polymerase Chain Reaction (PCR) down to nanoliter scale with a heater-integrated microfluidic device; optimization of on-chip PCR protocols.
- Pre-production test of the microfluidic chips fabricated by Fluidigm Co. (2001).
- Instructed an undergraduate in his project on thermal actuation of microfluidic valves.

Fudan University, Shanghai, China (Advisors: Y.L. Yang and J.D. Ding) 1997~2000

- Development of composite materials (polymer matrix as well as phospholipid vesicles) containing bacteriorhodopsin (bR membrane protein).
- Measurement of the optical and photoelectric signals of the above composite materials.
- Bacteria culture; protein extraction and purification.

SELECTED PUBLICATIONS

- **Liu, J.**, Enzelberger, M., Quake, S.R., A nanoliter rotary device for polymerase chain reaction, *Electrophoresis*, 23(10), 1531-1536, 2002.

- **Liu, J.**, Hansen, C., Quake, S.R., Solving the world-to-chip interface problem with a microfluidic matrix, *Analytical Chemistry*, 75(18), 4718-4723, 2003.
- **Liu, J.**, Williams A.B., Gwartz, R.M., Wold, B.J., Quake, S.R., Enhanced signals and fast nucleic acid hybridization using microfluidic chaotic mixing, *Angew. Chem. Int. Ed.* 45, 3618-3623, 2006.
- Spletter, M.L., **Liu, J.**, Liu, J., Su, H., Giniger, E., Komiyama, T., Quake, S., Luo, L., Lola regulates Drosophila olfactory projection neuron identity and targeting specificity, *Neural Development*, 2(14), 2007

PATENTS (co-inventor of three issued and two pending patent applications)

- Microfabricated elastomeric valve and pump systems. **US 6,929,030B2**, Aug. 16, 2005
- Nucleic acid amplification utilizing microfluidic devices. **US 6,960,437B2**, Nov. 1, 2005
- Method of forming a via in microfabricated elastomer structure. **US 7,25,128B2**, Jul. 31, 2007
- Microfluidic rotary flow reactor matrix. (filed in 2004)
- Enhanced signals and fast nucleic acid hybridization using microfluidic chaotic mixing. (filed in 2005)

TEACHING EXPERIENCE

California Institute of Technology, Pasadena, CA

- Teaching Assistant, *Applied Physics 109: Micro/Nano fabrication Laboratory*, (2002~2004).
- Teaching Assistant, *Chemistry 3A: Fundamental Techniques of Experimental Chemistry*, (2000~2001).

HONORS AND AWARDS

- One optical micrograph was featured in NCI alliance for nanotechnology in cancer 2008 Calendar.
- One device was featured in the cover of *Engineering and Science* (Volume LXVI, Number 2, 2003).
- Association of Laboratory Automation (ALA) Travel Fellowship (2003).
- Dow Travel Award (2002~2003).
- *Guanghua* Fellowship (1999), *Xu Zengshou* Scholarship (1997), Fudan Univ.

SOCIAL ACTIVITIES

- Committee member of Caltech Biotechnology Club (2003~2004).
- Student host for visitors: Prof. Gary Ruvkun from Harvard Univ. (2002); Prof. Seong Ihl Woo from Korea Advanced Institute of Science and Technology (2003)
- Student host of a seminar series on Bio-X at Fudan University (1999~2000).

PRESENTATIONS

- Biophysical Society Annual Meeting, Long Beach, CA (February, 2005).
- Smalltalk2003 Conference, San Jose, CA (July, 2003).
- IBC BioMEMs and Microfluidics Conference, San Diego, CA (April, 2003).
- Material Research Society (MRS) Spring Meeting, San Francisco, CA (April, 2002).