

Edgar D. Goluch

<i>Date of Birth:</i>	May 20, 1981	<i>Address:</i>	Kavli Institute of Nanoscience
<i>Place of Birth:</i>	Chicago, Illinois, USA		Section Molecular Biophysics
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Education

12/2007 **Ph.D. in Bioengineering**
University of Illinois at Urbana-Champaign, Advisor: Chang Liu

08/2005 **M.S. in Mechanical Engineering**
University of Illinois at Urbana-Champaign, Advisor: Chang Liu

05/2003 **B.S. in Chemical Engineering with Departmental Distinction**
University of Illinois at Urbana-Champaign, Advisor: Huimin Zhao

Employment

Since 02/2008 **Postdoc Fellow**, Delft University of Technology, the Netherlands
Main Project: Electrochemical Biosensors for the Detection of Individual Enzyme Catalysis Events
Areas of research: molecular biophysics, nanofluidics, single molecule detection

2003-2007 **Research Assistant**, University of Illinois at Urbana-Champaign
Areas of research: microfluidics, nanotechnology, biosensors

Summer 2007 **Laboratory Instructor**, University of Illinois at Urbana-Champaign

2001-2003 **Teaching Assistant**, University of Illinois at Urbana-Champaign

Summer 2002 **Analytical Laboratory Technician**, UOP, LLC.

Summer 2001 **Research and Development Engineer**, Guinness/UDV

Summer 2000 **Research and Development Technician**, Turtle Wax, Inc.

Awards

U.S. National Science Foundation – International Research Fellowship Program, 2008

Human Frontiers Science Program – Cross Disciplinary Fellow, 2008

Listed in Incomplete list of teachers ranked as excellent by their students (top 30% of all instructors)
Fall 2003: Fluid Mechanics Laboratory
Spring 2003: General Chemistry II

Teaching Experience

July 2007 – Cell Mechano-Sensitivity Summer Course

Fall 2003 – Fluid Mechanics Laboratory (2 sections)

Fall 2001 – Spring 2003 – General Chemistry I & II (1 section per semester, 4 total)

Professional Activities

Memberships:

American Institute of Chemical Engineers
American Chemical Society
Society for Biological Engineering
Omega Chi Epsilon, National Honor Society for Chemical Engineering
Alpha Chi Sigma, Zeta Chapter, Professional Chemistry Fraternity

Service:

Reviewer for *Lab-on-a-Chip*, *Analytical Chemistry*, *Biosensors and Bioelectronics*,
Chemical Society Reviews, *Journal of Materials Chemistry*
Freshman Applied Physics Student Project Leader, Spring 2009
Nanoscale Science and Engineering Center Graduate Student Board Advisor, 2005-2007

Journal Publications in Preparation

1. Goluch, E.D., Tepper, A.W.J.W., Singh, P.S., Zevenbergen, M.A.G., Wolfrum, B.L., Heering, H.A., Canters, G.W., Lemay, S.G. "Nanofluidic Sensors for Electrochemical Detection of Biomolecules."
2. Zevenbergen, M.A.G., Singh, P.S., Goluch, E.D., Wolfrum, B.L., Lemay, S.G. "Single Molecule Detection in Nanofluidic Cavities."

Selected Peer-Reviewed Journal Publications

1. Zevenbergen, M.A.G., Singh, P.S., Goluch, E.D., Wolfrum, B.L., Lemay, S.G. "Electrochemical Correlation Spectroscopy in Nanofluidic Cavities." *Analytical Chemistry*. **2009**, In Press, DOI: 10.1021/ac9014885.
2. Zevenbergen, M.A.G., Wolfrum, B., Goluch, E.D., Singh, P.S., Lemay, S.G. "Fast Electron-Transfer Kinetics Probed in Nanofluidic Channels." *Journal of the American Chemical Society*. **2009**, *131*, 11471-11477.
3. Goluch, E.D., Stoeva, S.I., Lee, J.-S., Shaikh, K.A., Mirkin, C.A., Liu, C. "A Microfluidic Detection System Based Upon a Surface Immobilized Biobarcode Assay." *Biosensors & Bioelectronics*, **2009**, *24*, 2397-2403.
4. Goluch, E.D., Wolfrum, B., Singh, P.S., Zevenbergen, M.A.G., Lemay, S.G. "Redox Cycling in Nanofluidic Channels using Interdigitated Electrodes." *Analytical and Bioanalytical Chemistry*, **2009**, *394*, 447-456. (cover article)
5. Goluch, E.D., Shaw, A.W., Sligar, S.G., Liu, C. "Microfluidic Patterning of Nanodisc Lipid Bilayers and Multiplexed Analysis of Protein Interaction." *Lab-on-a-Chip*, **2008**, *8*, 1723-1728.
6. Goluch, E.D., Nam, J.M., Georganopoulou, D.G., Chiesl, T.N. Shaikh, K.A., Ryu, K.S., Barron, A.E., Mirkin, C.A., Liu, C. "A Bio-Barcode Assay for On-Chip Attomolar-Sensitivity Protein Detection" *Lab-on-a-Chip*, **2006**, *6*, 1293-1299.
7. Shaikh, K.A., Ryu, K.S., Goluch, E.D., Nam, J.-M., Liu, J., Thaxton, C.S., Chiesl, T.N., Barron, A.E., Lu, Y., Mirkin, C.A., Liu, C. "A Modular Microfluidic Architecture for Integrated Biochemical Analysis," *PNAS*, **2005**, *102* (28), 9745-9750.

Patents

"Microfluidic Systems and Components." U.S. Patent number 7,351,303.