Analytical Chemistry

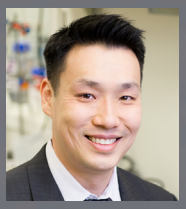
Department of Chemistry
University of Illinois at Urbana-Champaign

For more information, visit
chemistry.illinois.edu

Photo: Argonne National Laboratory

What is Analytical Chemistry?

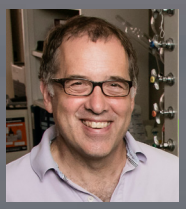
Analytical Chemistry at Illinois focuses on measurement science that can help solve some of the most challenging problems in biomedicine, energy generation and storage, environmental quality, and security. From attoseconds to eons, single molecules to bulk materials, isotopic substitutions to reaction network dynamics, the characterization of chemical sytems is, as it has been for over a century, a central strength of the Department. World-class support facilities for surface and bulk characterization, instrument fabrication, and computation speed forefront development of science and technology.



Jefferson Chan

Development of chemical-based and protein-based probes for sensing and biological imaging of disease states including the tumor microenvironment

chemistry.illinois.edu/jeffchan



Andrew A. Gewirth

Alternative energy: batteries; fuel cells; solar; interfacial electrochemistry; spectroscopy; structure

chemistry.illinois.edu/agewirth

Hee-Sun Han

Development of new bioanalytical technologies using quantum dots (QDs), imaging, and microfluidics: QD-based cellular imaging, highly multiplexed single-molecule imaging for spatial transcriptomics, microfluidics-based single virus genomics, lab-on-a-chip platforms for disease diagnostics

chemistry.illinois.edu/hshan

Prashant K. Jain

Plasmonics; near-field manipulation of photophysics and photochemistry; super-resolution imaging of active sites in heterogeneous catalysis; artificial photosynthesis; imaging phase transformations in single nanocrystals

chemistry.illinois.edu/jain

Deborah E. Leckband

Recognition at interfaces, biomolecular force transduction, membrane protein interactions, fluorescence imaging, simulations, nanoscale properties of biomaterial interfaces

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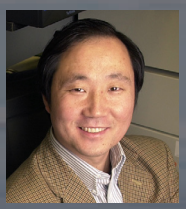

Yi Lu

DNA nanomaterials as biosensors for environmental monitoring, food safety and medical diagnostics; as imaging agents to understand metabolomics in bacterial infection and other diseases; as selective agents for targeted drug delivery

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Analytical Chemistry

Other faculty with interests in Analytical Chemistry

Rohit Bhargava (affiliate faculty)
Infrared and Raman spectroscopy; chemical imaging; cancer pathology; 3D printing for tumor models

Dana D. Dlott (emeritus faculty)
Laser spectroscopy under extreme conditions

Mary L. Kraft (affiliate faculty)
Biomembrane compostion imaging

Shuming Nie
Nanotechnology and nanomedicine; ultrasensitive in-vitro diagnostics; wearable optoelectronic devices

Elena V. Romanova (research faculty)
Mass spectrometry-based discovery and characterization of endogenously expressed peptides in tissues and individual cells; functional implications

Stanislav Rubakhin (research faculty)
Microbioanalytical chemistry; mass spectrometry imaging; single cell and single organelle sample preparation and analysis

Stephen G. Sligar (emeritus faculty)
Nanobiotechnology and drug discovery

Aaron Timperman (research faculty)
Microfluidics; nanofluidics; proteomics for bioanalysis

Huimin Zhao (affiliate faculty)
Synthetic biology and natural product synthesis

Catherine J. Murphy

Inorganic nanomaterials for chemical sensing and cellular imaging; bioanalytical studies of the "protein corona" around nanoparticles; photothermal therapy with targeted nanoparticles

chemistry.illinois.edu/murphycj

Ralph G. Nuzzo

Chemistry of materials; condensed phase interfaces; analytical protocols characterizations

chemistry.illinois.edu/r-nuzzo

Joaquín Rodríguez-López

Nanoelectrochemistry; advanced electrochemical characterization and imaging of materials and interfaces for electrocatalysis and energy storage; redox polymers; ultrathin electrodes; electrochemical simulation

chemistry.illinois.edu/joaquinr

Mei Shen

Nano-bioanalytical chemistry; high spatiotemporal single cell signaling; neurochemistry

chemistry.illinois.edu/mshen233

Jonathan V. Sweedler

Analytical neurochemistry, including developing of new tools for metabolomics; peptidomics and single cell characterization; increasing our understanding of cell signaling in the brain

chemistry.illinois.edu/jsweedle

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