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 systems 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
Dissecting complex molecular networks in healthy/diseased tissues; single virus genomics; single cell transcriptomics; in vitro/in vivo imaging; quantum dots; microfluidics; high-throughput technologies
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
Bioanalytical chemistry, molecular force probes; single molecule mechanochemistry; surface analysis; neutron reflectivity; micropatterning for cell biology studies
chemistry.illinois.edu/leckband

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
chemistry.illinois.edu/yi-lu

For more information, visit chemistry.illinois.edu
Other faculty with interests in Analytical Chemistry

Rohit Bhargara (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 composition imaging

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

Chad M. Rienstra
Biological solid-state NMR

Mei Shen (research faculty)
Nanobioanalytical chemistry; high spatiotemporal single cell signaling; neurochemistry

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; interfaces for electrocatalysis and energy storage; redox polymers; ultrathin electrodes; electrochemical simulation
chemistry.illinois.edu/joaquinr

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