

Analytical Chemistry

Department of Chemistry
University of Illinois Urbana-Champaign

For more information on Analytical Chemistry faculty, scan →



Photo: Argonne National Laboratory



Jefferson Chan

Development of assays to quantify critical biomarkers for aging, neurological disorders, and cancer; discovery of changes in the tissue microenvironment during disease progression through synthesis of responsive imaging agents; design of responsive platforms for on-demand and site-selective drug discovery



Hee-Sun Han

High-throughput, high-resolution omics technologies; lab on a chip platforms; imaging-based spatial transcriptomics; synthetic cell assembly; systems biology in brains and microbial populations



Prashant K. Jain

Electrochemistry; nanoscale imaging; surface-enhanced Raman scattering spectroscopy; energy chemistry



Christy F. Landes

Developing new spectroscopic tools to image chemical dynamics at interfaces at the limit of a single event; creating new models to understand and predict macroscale processes like protein separation and photocatalysis



Stephan Link

Photophysics and photochemistry of nanomaterials; plasmonics; solar energy conversion; single-particle imaging; ultrafast spectroscopy



Xiaotang Lu

Advanced imaging for understanding the development and pathology of the brain circuits; ultrastructural imaging to resolve synaptic connectivity; multidimensional imaging from whole brains to nanoscale subcellular details; multiplexed proteomic and transcriptomic imaging; (bio) chemical probes design; nanomaterials; and tissue chemistry

Analytical Chemistry

chemistry.illinois.edu

Other faculty with interests in Analytical Chemistry

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

Mary L. Kraft (faculty affiliate)
Biomembrane composition imaging

Liviu M. Mirica
Development of diagnostic and imaging agents for neurological disorders; electrocatalysis for small molecule activation

Shuming Nie
Quantum dots; SERS; nanomedicine; image-guided surgery; biomaterials; cancer immunotherapy

Lisa Olshansky
Biomimetic coordination complexes and artificial metalloproteins; spectroscopic characterization; applications in catalysis, energy, and biosensing

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

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

Huimin Zhao (faculty affiliate)
Synthetic biology; AI/ML; automation; protein engineering; metabolic engineering; natural product biosynthesis; biocatalysis



Catherine J. Murphy

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



Joaquín Rodríguez-López

Interfacial electrochemistry; scanning electrochemical microscopy (SECM); spectroelectrochemistry; automated electrochemistry; nanoelectrodes; batteries; electrocatalysis; graphene electrodes; redox polymers; electrochemical simulation; reactive oxygen species



Mei Shen

Bioanalytical chemistry; nanoelectrochemistry; scanning electrochemical microscopy; scanning ion conductance microscopy for nanoimaging; fast-scan cyclic voltammetry for in mouse brain measurement; neuronal circuit and health; the neuroscience of cancer; environmental exposure and brain health; gut-brain-immune axis; neurochemical measurement; acetylcholine chemical transmission



Jonathan V. Sweedler

Analytical mass spectrometry including the development of new tools for metabolomics; peptidomics and single-cell characterization; increasing our understanding of cell to cell signaling in systems ranging from microbial communities, endocrine systems and the brain



Liwei Zheng

Developing chemistry and technologies that encode molecular information into DNA sequencing readouts, enabling next-generation bioanalytical technologies; single-molecule protein sequencing; aptamer structure profiling and functional engineering; single-cell and spatial metabolomics