NYU SHANGHAI MOLECULAR SCIENCE

Founded in 2012, NYU Shanghai is China's first Sino-US research university and the third degree-granting campus of the NYU Global Network. The university seeks to cultivate globally minded graduates through innovative teaching, world-class research, and a commitment to public service.

Chemistry is the study of how atoms and molecules interact and rearrange chemical bonds to form new chemical compounds. Chemistry provides a foundation for understanding both basic and applied scientific disciplines, including biology and materials science at a fundamental level. Our program provides students broad training in the forefront of modern chemistry to better prepare them for future challenging careers.

Concerned with the workings of life in all its varied forms, biology has been revolutionized by the development of molecular, cellular, genomic, and bioinformatics techniques that are now being utilized to study fundamental processes in organisms and to improve human health. Our biology curriculum aims to train students with modern biological theories and state-of-the-art technology to prepare students for new challenging and exciting careers.

NYU Shanghai's Molecular Science Program has the following mission:
To provide a unique modern platform for world-class research, to train students and young scientists with an interdisciplinary atmosphere, and to foster international collaborations.

EDUCATION & TRAINING

Undergraduate Studies

NYU Shanghai Degree
Undergraduate Studies in Chemistry
Undergraduate Studies in Biology

NYU Shanghai students earn a Bachelor of Arts or Bachelor of Science degree conferred by New York University—the same degree awarded at our New York campus—as well as a Chinese diploma recognized by the Chinese government, qualifying graduates for opportunities both in China and around the world.

Undergraduate students have unparalleled access to the cutting-edge research environment at NYU Shanghai. In particular, science students are encouraged to begin research with faculty members as early as their freshman or sophomore year. All students undertake a research project during their senior year in an Integrate Science Capstone course. Advanced students are supported by Deans Undergraduate Research Funds to conduct projects over the summer and exceptional students may undertake two or more semesters of research with faculty for credit, culminating in an undergraduate thesis and an honors degree.

Graduate Training

NYU Shanghai offers the following graduate programs in related disciplines, providing candidates with academically rigorous training and extensive research experience in their field of study.

Ph.D. Program
Chemistry Ph.D. Program | NYU Shanghai   Biology Ph.D. Program | NYU Shanghai

NYU Shanghai, in partnership with the NYU Graduate School of Arts and Science, the NYU Department of Chemistry and the NYU Department of Biology, seeks exceptional students for PhD study and research in the respective program.
Participating students are enrolled in the NYU GSAS Chemistry or Biology PhD program, complete a portion of their coursework at the NYU Departments in New York, and then transition to full-time residence at NYU Shanghai where they finish their coursework and undertake their doctoral research under the supervision of NYU Shanghai faculty.

Highlights of the Program:
• NYU PhD degree upon graduation
• Graduate coursework at the NYU Department of Chemistry or the NYU Department of Biology in New York
• Research opportunities with close mentorship by NYU Shanghai faculty
• Access to the vast intellectual resources of NYU GSAS, NYU Departments
• The NYU- ECNU Center for Computational Chemistry at NYU Shanghai offers candidates a rich variety of activities and engagement opportunities including a revolving program of seminars and visiting scholars, a thriving community of PhD students, post-doctoral fellows, and research associates, and strong ties with other universities.
• Funding through the NYU Shanghai Doctoral Fellowship

Ph.D. Program: The N.E.T. PhD Program | ECNU
The NYU Shanghai–ECNU Joint Graduate Training Program (N.E.T.) is a program in which NYU Shanghai faculty, through collaborative arrangements with affiliated departments at ECNU, advise and incorporate ECNU graduate students into their research teams. Partnered with ECNU School of Chemistry and Molecular Engineering, School of Software Engineering, and State Key Laboratory of Precision Spectroscopy, NYU Shanghai Chemistry and Biology faculty recruit students for PhD study through the N.E.T. Program. Participating students will undertake their doctoral research under the supervision of NYU Shanghai faculty.

Highlights of the Program:
• Mentorship by a devoted group of faculty advisers who are engaged in cutting-edge research and interdisciplinary collaboration.
• Collaboration with renowned scholars from all over the world at the NYU-ECNU Center for Computational Chemistry at NYU Shanghai.
• Access to the training and educational resources of East China Normal University, New York University, and NYU Shanghai.
• Upon successful completion of the program, students are awarded an ECNU PhD degree.
• Funding through the ECNU Doctoral Fellowship

Master's Program: The N.E.T. Master Program | ECNU
In addition to the N.E.T. Ph.D. track, NYU Shanghai Chemistry and Biology faculty, in partnership with schools at ECNU also admit students for the respective Master's program. Master's students will complete academically enriching coursework and gain new experience and insight in their research.

RESEARCH

NYU-ECNU Center for Computational Chemistry at NYU Shanghai
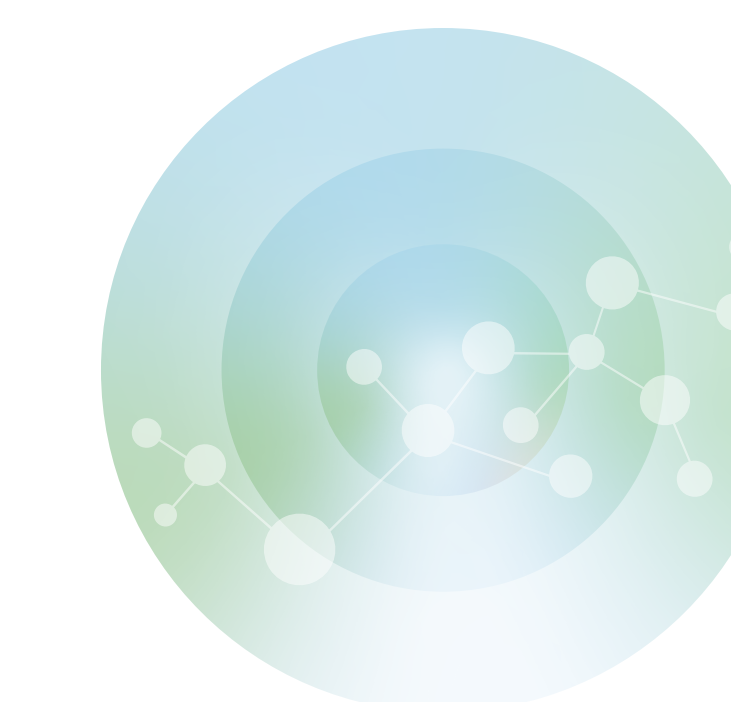
NYU-ECNU Center for Computational Chemistry at NYU Shanghai

Advances in modern computational methodologies and high-performance computing have vastly expanded the ability of computational chemists to model chemical, material, and biological systems; to predict their structures, functions, and various properties; and to design new molecular systems with desired properties.

The mission of the NYU-ECNU Center for Computational Chemistry at NYU Shanghai is to provide a platform for world-class research, for training students and young scientists, and for international collaboration in computational chemistry. The center has a core group of outstanding faculty members from New York University, East China Normal University, and NYU Shanghai who are conducting frontier research in various fields of computational chemistry, biology, and material sciences. The center carries out a variety of academic activities, including a seminar series featuring international and domestic speakers who are leading scientists in frontier research, symposia and workshops, and a visiting scientist program.

The unique synergy of the center in international scientific exchange and collaboration, especially between American and Chinese scientists, provides a strong foundation for researchers to carry out truly challenging and innovative research at a premier international center for computational research in chemistry and related fields.

Student Internship Opportunities: SRPMS

The NYU-ECNU Center for Computational Chemistry at NYU Shanghai provides a number of research experiences for students everywhere. One such program is the NYU Shanghai Summer Undergraduate Research Experience Program in Molecular Science (SRPMS). SRPMS is designed to foster entry into research-centered careers for highly motivated undergraduate students with a strong interest in chemistry, biology, or related scientific disciplines.

Students apply for positions in a 2+ month summer program. In addition to a series of training sessions and social events, students engage in research projects under the mentorship of a professor who is active at the forefront of his or her field of chemistry and biology.

Students are matched to faculty primarily on the basis of their background preparation and areas of interest. They work either directly with faculty or with postdoctoral fellows and graduate students as appropriate. Each student conducts a research project under the direction of his or her mentor.

At the end of the program, a presentation and a project summary are required. Successful applicants receive financial support from NYU Shanghai.

Optimized force field expression for metal coordination with charge transfer and polarization.

COVER IMAGE COURTESY OF JOHN ZHANG

Faculty Advisors

By alphabetical order of last name
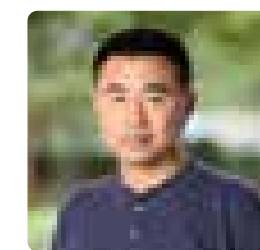
Gang Fang
Assistant Professor of Biology, NYU Shanghai
Email: gf54@nyu.edu
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Eligible to advise graduate students

Gang Fang is an Assistant Professor of Biology at NYU Shanghai. He is also Affiliate Assistant Professor at the Department of Biology and Center for Genomics and Systems Biology at NYU's campus in New York City. Prior to joining NYU Shanghai, he was an Associate Research Scientist at Yale University. He holds a PhD from Institute Pasteur, France, and BS and MS degrees from Peking University, China.
Research Interests: Professor Fang's research interests are genomics, molecular evolution, and computational biology. He has developed the concept of gene evolutionary persistence and employed this concept in the studies of genome organization, proteome evolution, and transcriptome and biology networks. His papers have been published in *Molecular Biology and Evolution, Genome Research, Genome Biology, PLoS Computational Biology, PNAS, BMC genomics, Nature, Nature Genetics Reviews,* and *Trends in Genetics,* among others. Professor Fang's current work focuses on evolutionary and comparative analysis of large-scale functional genomics data and system and synthetic biology.
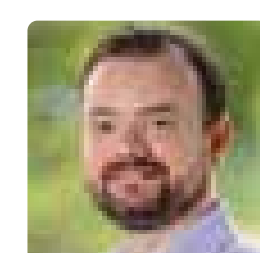
William Glover
Associate Director, NYU-ECNU Center for Computational Chemistry at NYU Shanghai
Assistant Professor of Chemistry at NYU Shanghai
Global Network Assistant Professor, Department of Chemistry, NYU
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Eligible to advise graduate students

William Glover is an Assistant Professor of Chemistry at NYU Shanghai. He received his PhD from the University of California, Los Angeles, in 2009 and has since held postdoctoral fellowships at Stanford and UCLA.
Research Interests: Professor Glover's group is interested in developing an atomistic description of light-initiated chemistry in complex environments. The general strategy is to build up understanding from isolated molecules to large biomolecules while making direct connection to experiment by computing observables relevant to ultrafast spectroscopy. A particular area of interest is the damage of biological molecules by UV and ionizing radiation, which tends to occur via a rich array of competing reaction pathways. For example, it is well known that ionizing radiation damages DNA, but this can occur via direct channels (electronic excitation of the nucleic acids) and indirect pathways such as attack from free radicals like the hydrated electron. To tackle the inherent complexity of these systems we employ state-of-the-art graphical processing unit (GPU)-based computational chemistry and multi-physics modeling.

Jungseog Kang
Assistant Professor of Biology, NYU Shanghai
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Jungseog Kang is an Assistant Professor of Biology at NYU Shanghai. Prior to joining NYU Shanghai, he was a Research Scientist at UT Southwestern Medical Center. He holds a Ph.D. from UT Austin and a B.S. from KAIST in Korea.
**Research Interests:** Professor Kang's research interests are chromosome segregation, mitosis, and antimitotic cancer drug screen. His works in these fields have appeared in *Journal of Cell Biology, Journal of Biological Chemistry, PNAS, Molecular Cell, Cell,* and others. He studies how mitotic checkpoint pathway ensures faithful chromosome segregation in higher eukaryotes and tries to build quantitative models of mitotic process by which therapeutic intervention of cancers can be probed.

Henry James (Xiaotao) Li
Professor of Practice in Biochemistry, NYU Shanghai
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Henry James Li is a Professor of Practice in Biochemistry at NYU Shanghai. He earned his PhD from the University of Texas MD Anderson Cancer Center and his MD from Chongqing University of Medical Sciences. He started his academic career as an Assistant Professor of Cell Biology at Baylor College of Medicine. Prior to his current appointment, he was an Adjunct Professor of Biochemistry at NYU Shanghai and worked as a Professor of Biochemistry at the East China Normal University, School of Life Sciences, Shanghai Key Laboratory of Regulatory Biology & Institute of Biomedical Sciences.
**Research Interests:** Professor Li was one of the pioneers in the discovery of the first mammalian target of REGγ (a proteasome activator). He remains interested in the biological functions/molecular mechanisms of the REGγ-proteasome pathway, including protein homeostasis in metabolism, neuronal degeneration, and cancer development, and solutions to fight against related human diseases. He has over 70 publications in internationally recognized journals, including *Cell, Molecular Cell, PNAS, Cell Metabolism, Autophagy,* and *Nature Communications* with more than 2000 citations.
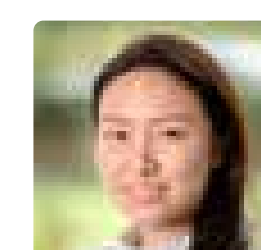
Wenshu Li
Associate Professor of Practice of Biology, NYU Shanghai
Email: wl43@nyu.edu

Wenshu Li is an Associate Professor of Practice of Biology at NYU Shanghai. Prior to joining NYU Shanghai, she was a visiting scholar in the College of Medicine at the University of Illinois at Chicago. She holds a PhD from the State Key Laboratory of Genetic Engineering at Fudan University and a BS from Jilin University.
**Research Interests:** Professor Li's research interests are cancer biology and stem cell biology, focusing on the mechanism of tumorigenesis and metastasis, the molecular pathways that control the self-renewal, and proliferation of cells. Her article, "Apc Regulates the Function of Hematopoietic Stem Cells Largely Through β-Catenin-Dependent Mechanisms" was published in *Blood*.
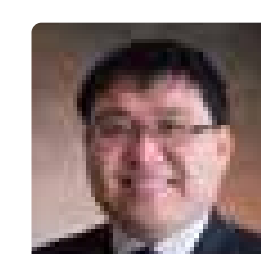
Xiang Sun
Assistant Professor of Chemistry / Graduate Coordinator of Chemistry, NYU Shanghai
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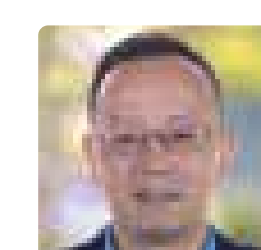*Eligible to advise graduate students*

Xiang Sun is an Assistant Professor of Chemistry at NYU Shanghai. Prior to joining NYU Shanghai, he was a postdoctoral research fellow at the University of Michigan, Ann Arbor and a visiting scholar at the University of California, San Diego. He holds a Ph.D. in Chemistry from Brown University and a B.S. in Chemical Physics from the University of Science and Technology of China (USTC).
Research Interests: Professor Sun is interested in quantum dynamics in condensed-phase systems, such as liquid solutions, surfaces, biological macromolecules, and energy-conversion nanomaterials. A fundamental goal of his research is to obtain a molecular-level understanding of how electronic and vibrational excitation influence the mechanisms, outcomes, and spectroscopic signatures of dynamics in these complex molecular systems. Since electronic and vibrational relaxation usually has a quantum nature, it is highly desirable to have methods that accurately describe the relevant quantum dynamical effects, while still being computationally feasible for large-scale systems like classical methods do. The Sun group is focused on developing semiclassical and mixed quantum-classical methods from classical molecular dynamics (MD) techniques for understanding dynamics following molecular excitation with the help of statistical mechanics, quantum chemistry, and Feynman's path integral formalism. Having an insight into the many-body dynamics helps us learn the molecular lessons of ultrafast spectroscopes and gain a deeper understanding of charge and energy transfer dynamics in light-harvesting biomolecules and organic photovoltaic materials.
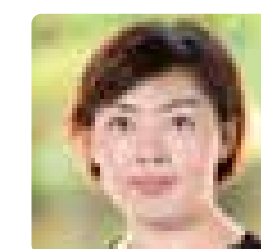
Danyang Yu
Area Head of Natural Sciences / Professor of Practice of Biology, NYU Shanghai
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Danyang Yu received her BS at Tsinghua University, Beijing, and her PhD from NYU in 2008, where she also performed postdoctoral work until 2010 in the laboratory of Stephen Small. Since 2010, she has been Assistant Professor at Fairleigh Dickinson University in New Jersey. She has published in high-ranking journals such as *Cell, Proceedings of the National Academy of Sciences of the USA,* and *Current Biology.*

John Zenghui Zhang
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Eligible to advise graduate students

John Zenghui Zhang received his B.S. degree from the Physics Department of East China Normal University in 1982 and his Ph.D. degree from University of Houston in 1987. He did his postdoctoral research at UC Berkeley from 1987 to 1990. He was an Assistant Professor of Chemistry at NYU from 1990-1994, an Associate Professor from 1994-1997, and has been a Professor since 1997.
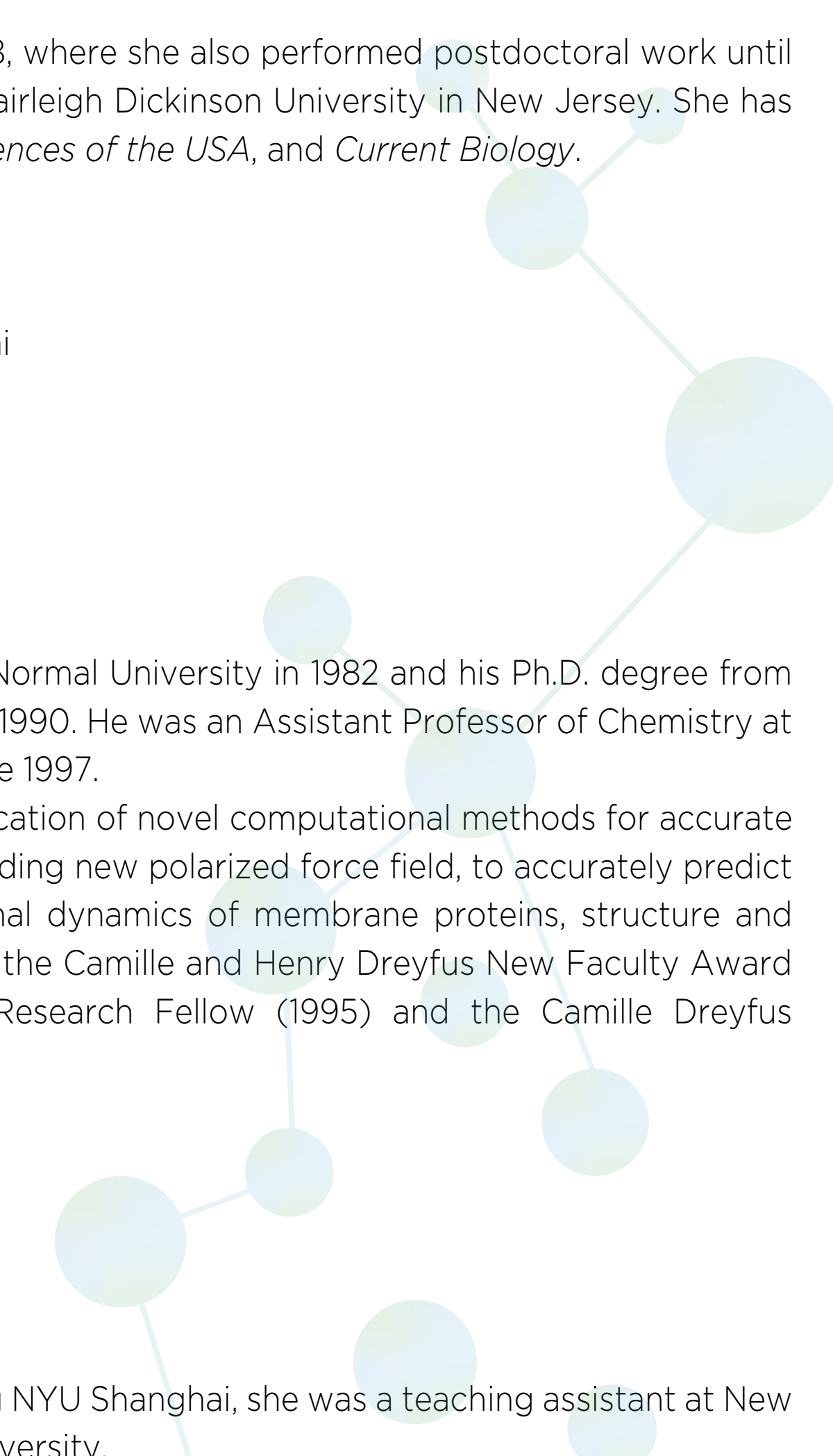**Research Interests:** Professor Zhang's current research focus is the development and application of novel computational methods for accurate and efficient study of biological systems. He develops quantum and classical methods, including new polarized force field, to accurately predict protein structure, free energy in protein-drug and protein-protein bindings, conformational dynamics of membrane proteins, structure and dynamics of metalloproteins. John Zhang has received many prestigious awards, including the Camille and Henry Dreyfus New Faculty Award (1990), the NSF Presidential Faculty Fellow (1994), the Alfred P. Sloan Foundation Research Fellow (1995) and the Camille Dreyfus Teacher-Scholar (1995).
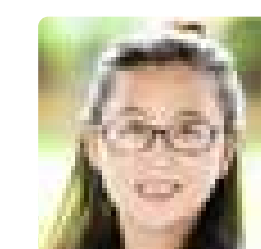
Lu Zhang
Associate Professor of Practice in Chemistry, NYU Shanghai
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Lu Zhang is an Associate Professor of Practice in Chemistry at NYU Shanghai. Prior to joining NYU Shanghai, she was a teaching assistant at New York University. She holds a PhD from New York University and an MS and BS from Jilin University.
Research Interests: Professor Zhang's research interests are in DNA damage caused by chemical carcinogens that are byproducts of fossil combustion that include polycyclic aromatic hydrocarbons. The focus of her research is on the mechanisms of recognition and processing of DNA lesions by the human nucleotide excision repair system that removes damaged DNA and thus protects the human genome from DNA-damaging exogenous and endogenous reactive chemicals.

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