The CUNY Advanced Science Research Center is CUNY’s collaborative, interdisciplinary research center, operated by the Graduate Center and located on the City College campus. The mission of the ASRC is to elevate scientific research and education at the university through five distinctive disciplines: environmental sciences, nanoscience, neuroscience, photonics, and structural biology.

Founded by nine eminent research institutions in 1999, the New York Structural Biology Center (NYSBC), located on CUNY’s City College campus, is a global leader in structural biology. With unsurpassed expertise and instrumentation, the NYSBC provides biomedical research services to commercial and academic clients, including high throughput gene-to-structure determination, structure-based drug design, crystallography, NMR spectroscopy, cryo-electron microscopy and protein production. This consortium shares numerous high-field NMR spectrometers operating at 500-900 MHz, a 600 MHz Dynamic Nuclear Polarization spectrometer, numerous high-end TEMs and SEMs, and access to NYX, an X-ray beamline designed to utilize the brightness of the NSLS-II, the synchrotron facility opened in 2015 at Brookhaven National Lab. The NYSBC supports projects to elucidate the role of proteins and nucleic acids in human disease and to develop fields such as structural genomics and proteomics.

The New York Center for Biomedical Engineering at the City College of New York, a consortium involving CUNY, Weill Medical College of Cornell University, and Mount Sinai School of Medicine, was established to serve as a national urban model for biomedical engineering training for both undergraduate and graduate students. Founded in 1994 by Distinguished Professor Sheldon Weinbaum, the Center includes 30 faculty and their teams who have worked to create a robust pipeline for African-American and Hispanic students in this field.

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Approved as an Institute of the City University of New York (CUNY) in July, 2003, the Macromolecular Assemblies Institute (MMA) builds on the research strength of campus-based faculty in Chemistry, Biology, Physics, and Engineering, on the collaborative research alliances we have made with other institutions, and on our unique laboratory capabilities. As a multi-campus entity, we have sought to become a cohesive group of researchers in an institute that constitutes more than the sum of its parts.

The MMA coordinates research investigations for both natural and engineered macromolecular assemblies of biological and medical importance, integrates graduate and undergraduate training in these areas across CUNY, and aims to expand both public and private support for these research endeavors.

Faculty and staff affiliates are based at Brooklyn College, City College, College of Staten Island, Hunter College, The CUNY Graduate Center, Lehman College, and York College.

The infrastructure of the MMA has been supported by New York State’s Generating Employment through New York Science (Gen*NY*sis) program, CUNY’s Office of Academic Affairs, The College of Staten Island, City College, and the National Science Foundation (NSF).

MMA research efforts are funded by the NSF, the National Institutes of Health, the Departments of Agriculture, Defense and Energy, private foundations, and infrastructural resources from the university.

### Research Goals

The specific longstanding research goals of the CUNY Macromolecular Assemblies Institute involve basic research with applications primarily to human health, energy transfer, and agriculture. Our faculty-led teams focus on macromolecular targets such as proteins, nucleic acids, lipids, and carbohydrates, with specific goals that include the following:

- to identify and characterize new molecular targets for drug design
- to delineate disease-related macromolecular signals of cellular metabolism
- to understand protein-nucleic acid interactions in animals, plants, and viruses
- to characterize the structure of macromolecular assemblies associated with microbial virulence and cellular resistance to chemotherapy
- to design polymeric biomedical materials for metabolic sensing and drug delivery
- to design self-assembled materials for light harvesting, imaging, and sensor applications
- to identify natural polymer complexes that promote resistance of plants to microbial pathogens and other environmental stresses
- to develop the technological infrastructure to attain these goals

These research goals are pursued using three distinct but related strategies: discovery of structure-function relationships for molecular machines, simulation of macromolecular structures, and bio-inspired design of functionally robust assemblies.

### Educational Programs

**Graduate**
- CUNY Ph.D. Programs in Chemistry, Biology, Biochemistry, Physics, Chemical Engineering, Computer Science; Molecular Biophysics track in Chemistry, Biochemistry, or Physics
- Teaching and research fellowships
- Fellowships for underrepresented minorities

**Undergraduate**
- Summer research experiences for undergraduates
- Chemistry, biochemistry, biology, physics, chemical engineering, biotechnology, pre-medical, pre-pharmacy curricula
- Fellowships for underrepresented and economically disadvantaged students

### Outreach Activities

- Research-inspired K-12 Laboratory Curricula
- Summer ‘Bridges to College’ Workshops
- Laboratory Visits and Open House presentations
- Research Internships and Networking Luncheon

### Institutional and Economic Development

- Research: grants, publications, seminars, symposia, focus groups, review panels
- Education: curricula, workshops, technical training, recruitment
- Technology: patents, licenses, industrial partnerships
- Jobs: R&D stimulation, new businesses, added employment opportunities