Job Title	Postdoctoral Associate
PVN ID	RC-2412-006639
Category	Postdoctoral
Location	CUNY-ADVANCED SCIENCE RESEARCH CENTER
Department	Nanoscience
Status	Full Time
Annual Salary	$64,350.00 - $64,350.00
Hour(s) a Week	35
Closing Date	Jul 31, 2025 (Or Until Filled)

General Description

The Ulijn lab (www.ulijnlab.com) in the Nanoscience Initiative at CUNY's Advanced Science Research Center (asrc.gc.cuny.edu) is seeking to recruit two highly motivated postdoctoral research associates to research the peptide sequence space as a universal materials assembly code (1), following from recent research in this area in designed supramolecular systems (2), encapsulation systems (3), and materials with context-adaptive functions (4).

The overall objective of this project is to understand how complex mixtures of peptides interact and acquire functionality, and to repurpose this understanding to create new nanotechnology that is inspired by living systems with features such as chemical recognition and catalysis, energy conversion and motility. The combination of complexity science, systems chemistry, biophysical chemistry and nanoscience could ultimately produce breakthrough materials and modalities with diverse applications in biomedicine, green technology and more. The research is cross-disciplinary and combines supramolecular self-assembly, systems chemistry, molecular dynamics simulations, analytical chemistry (with a focus on LC-MS quantification of complex mixtures), and various imaging techniques. The postdocs are expected to be experts in their own fields, and collaborate with researchers with complementary research skills at the ASRC and elsewhere.

1 a. P.W.J.M. Frederix, *et al*., Exploring the Sequence Space for (Tri-)peptide Self-Assembly to Design and Discover New Hydrogels, *Nature Chemistry*, 2015, 7, 30-37.; b. K. Kaygisiz, *et al*., Context-Dependence in Assembly Code for Supramolecular Peptide Materials and Systems. *Nature Reviews Materials*, 2024, *accepted*.

2 a. S. Kassem, *et al*., Emergence of Cooperative Glucose Binding Networks in Adaptive Peptide Systems, *J. Am. Chem. Soc.* 2023, 145, 17, 9800–9807.; b. A. Jain, *et al*., Tractable Molecular Adaptation Patterns in a Designed Complex Peptide System *Chem* 2022, 8, P1894-1905.

3 a. Y. Marciano, *et al*., Encapsulation of Gold-Based Anticancer Agents in Protease-Degradable Peptide Nanofilaments Enhances Their Potency *J. Am. Chem. Soc.* 2022, 145, 234-246.; b. N. Berisha, *et al*., Directed discovery of high-loading nanoaggregates enabled by drug-matched oligo-peptide excipients, *Chem*, 2024, *accepted*.; c. D. Dave, et al., Adaptive and Space-Filling Peptide Self-Assembly Upon Drying, *ChemRXIV*,

2024, 10.26434/chemrxiv-2024-cmwjx.

4 a. R. Piotrowska, *et al.* Mechanistic Insights of Evaporation-Induced Actuation in Supramolecular Crystals. *Nature Mater.*, 2021, 20, 403-409.; b. V. Athiyarath, *et al*., Peptide Hydrate Crystals with Context-Adaptive Topology, *ChemRXIV*, 2024, 10.26434/chemrxiv-2024-0h3km.

Other Duties

- Conducts experimental research in the area of systems chemistry, peptide nanotechnology, supramolecular materials;
- Prepares papers for publication in peer-reviewed journals; prepares invention disclosures and patents; present lectures at conferences;
- Collaborates with internal and external academic colleagues, and participates in knowledge exchange activities to establish research links with industry;
- Assists in laboratory management, laboratory maintenance, laboratory safety;
- Assists in mentorship of undergraduate and graduate students, including visiting students;
- Conducts individual and/or collaborative research, and contributes to the development of new research methods and ideas, giving direction to the project;
- Assists in the development and planning of research objectives for specific projects, and contributes to the development of research objectives as part of the wider research program within the group, with guidance from the academic supervisor, as appropriate;
- Performs other related duties as assigned.

Qualifications

The applicant should have:

- PhD in experimental or theoretical chemistry, materials science, bio-nanotechnology, biophysics, supramolecular chemistry, systems chemistry, or related fields.
- Strong hands-on experience in experimental or computational research in peptide-based materials, systems chemistry, self-assembly, stimuli-responsive materials.
- Previous experience in communicating research results at conferences and through publication in quality peer-reviewed journals.