



# CONVERGENCE RESEARCH INITIATIVES CHEMISTRY OF LIFE PROCESSES INSTITUTE

## ACCELERATING TEAM SCIENCE

New cures begin with people—individuals living with disease and the clinicians and scientists working to make them better. The **Chemistry of Life Processes Institute (CLP)** has developed a series of **Convergence Research Initiatives**, which bring together teams of Northwestern chemists, life scientists, and engineers, with clinicians in Northwestern's Feinberg School of Medicine (FSM) to provide a holistic approach to critical clinical problems that stretch from the lab bench to the patient bedside.

Working together, these teams are transforming how we diagnose, treat and, someday, cure devastating diseases that have eluded effective treatments.

Areas of CLP-FSM convergence research include:

- Neurodegenerative Diseases
- Aging and Metabolic Diseases
- Cancer
- Cardiovascular Disease
- Kidney Disease
- Liver Disease and Transplantation

Institute leadership has convened a *Scientific Advisory Committee*, comprised of medical researchers and CLP leadership, to identify clinically relevant areas for pilot funding over the next five years. The Institute also hosts a series of *Convergence Research Workshops* for faculty and students that stimulate collaboration in areas of greatest clinical need.

## ADVANCING PRECISION MEDICINE

The Institute's **Convergence Research Initiatives** propel CLP towards clinical impact by enabling team members to jointly conceptualize how protein-based discovery can be applied to unresolved medical challenges. For example:

### *Multidisciplinary push toward treatment of ALS*

- A CLP-paired chemist and neurologist identified the first drug-like compound to improve the health of upper neurons, the movement-initiating nerve cells in the brain.
- NU-9 was invented based on chemistry findings that showed how some protein behaviors are toxic to the upper motor neurons, which leads to degeneration of nerve cells in people with ALS.

### *Using proteoform signatures in blood to predict organ transplant rejection*

- CLP partnered with FSM transplant surgeons to leverage proteoform and organ transplant expertise to identify a panel of clinically significant proteoforms in immune cells.
- They found that these proteoform indicators may help liver specialists identify patients in early stages of transplant rejection and enable fine-tuning of rejection-blocking medications.

## SECURING LARGE-SCALE FUNDING FOR LONG-TERM IMPACT

**CLP-FSM Convergence Research Initiatives** will catalyze novel ideas for understanding disease that will attract sustainable, large-scale funding from both federal agencies and foundations.

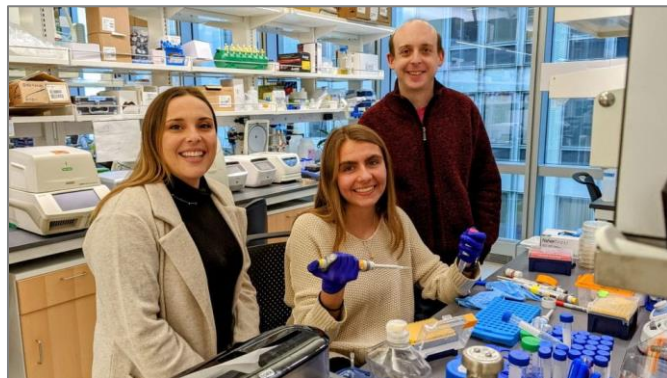
CLP faculty are renowned for development of unique methods for making, modeling and measuring biologically important molecules that play a critical role in health and disease. Institute staff are highly experienced in developing team science research programs and grant applications. These combined strengths have fueled major federally-funded interdisciplinary biomedical research awards for Northwestern, including a ten-year \$23 million Physical Sciences-Oncology Center (PSOC), a joint venture with Northwestern's Lurie Cancer Center, and the Northwestern Kidney Research Resource Center, in a collaboration led by the Feinberg Cardiovascular Research Institute.

## BUILDING GLOBAL PARTNERSHIPS

Tackling the biggest challenges in human health and disease requires partnerships with other world-leading institutions. To raise global awareness of CLP research and technology development and spark new global initiatives, CLP will organize an annual **Convergence Research Symposium** where CLP faculty and invited speakers will present new approaches and methods for drug and diagnostics discovery.

CLP will also launch a **Visiting Scholars Program** to enable biomedical researchers to spend time in CLP labs to learn advanced methods and stimulate new joint research projects.

These strategies will initially rely upon institutional funding for support, with the goal of eventually obtaining corporate sponsorship for each of these activities.



## TRAINING TOMORROW'S BIOMEDICAL INNOVATORS

One of the hallmarks of CLP is its innovative approach to training students at the interface of chemistry and biology. To grow the impact of the Institute's interdisciplinary research programs, the Institute is seeking support for a highly competitive **Convergence Fellows Program**. The two-year postdoctoral fellowship will be awarded to a cohort of outstanding postdoctoral associates who will learn new approaches to complex diseases from dual mentors (a basic researcher and a clinician).

Fellows will gain experience translating their innovations from the lab bench into society and acquire skills highly valued by the most prestigious academic institutions, pharmaceutical and biomedical companies, and research centers in the world.

To support CLP-FSM Convergence Initiatives please contact

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