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October 26, 2009 | Centers and Programs

Center to Open New Directions for Cancer Research \$13.6 million grant from National Cancer Institute is one of only 12 nationwide

By Megan Fellman



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EVANSTON, Ill. --- Northwestern University has been awarded a \$13.6 million five-year grant from the [National Cancer Institute](#) (NCI) to establish an interdisciplinary research center for the study of genes and their role in cancer. A better understanding of the mechanisms could lead to better diagnostics and therapeutics and open up new directions for research.

Northwestern's Physical Sciences-Oncology Center (PS-OC), one of 12 established nationwide by the NCI, brings together physical scientists and cancer biologists to use non-traditional, physical-sciences based approaches to understand and control cancer.

"Our center will be studying the regulation and expression of genes in both normal health and development and in cancer," said principal investigator [Jonathan Widom](#), the William Deering Professor in Biological Sciences in the [Weinberg College of Arts and Sciences](#). "We need to understand healthy cells to understand and control cancer."

The PC-OS initiative is expected to generate new knowledge in order to identify and define critical aspects of physics, chemistry and engineering that shape and govern the emergence and behavior of cancer at all scales.

"By bringing a fresh set of eyes to the study of cancer, these new centers have great potential to advance, and sometimes challenge, accepted theories about cancer and its supportive microenvironment," said NCI Director John E. Niederhuber, M.D. "Physical scientists think in terms of time, space, pressure, heat, and evolution in ways that we hope will lead to new understandings of the multitude of forces that govern cancer -- and with that understanding, we hope to develop new and innovative methods of arresting tumor growth and metastasis."

The Northwestern center is the result of a joint effort between the [Chemistry of Life Processes Institute](#) (CLP) and the [Robert H. Lurie Comprehensive Cancer Center of Northwestern University](#). Its focus is on the molecular mechanisms by which genetic and epigenetic information is encoded and decoded in cancer cells. By combining diverse approaches from the physical sciences, including nano- and atomic-scale investigation, advanced optics, high-level computational power and mathematical modeling, the center's investigators hope to gain new insights into fundamental processes of the cell.

Principal investigator Widom is a member of the CLP and the Lurie Cancer Center. [Jonathan Licht](#), the Johanna Dobe Professor in Hematology/Oncology in the [Feinberg School of Medicine](#) and associate director of clinical science research at the Lurie Cancer Center, is senior co-investigator of the Northwestern PS-OC.

Cross-disciplinary teams are at the heart of the new center. The Chemistry of Life Processes Institute will support the center's mission by bringing together a range of physical sciences researchers. The Lurie Cancer Center will link the fundamental inquiries of the physical scientists with the pressing needs of clinical oncologists and cancer patients.

The Northwestern PS-OC draws scientists -- theoretical physicists, mathematicians, molecular biologists, chemists, engineers and endocrinologists -- from Weinberg, Feinberg and the [McCormick School of Engineering and Applied Science](#). Other investigators are from the University of Chicago, Children's Memorial Hospital, the California Institute of Technology and the Weizmann Institute.

The Northwestern center consists of five project areas, each focused on different aspects of the storage and expression of genetic information. Each project integrates methods and ideas of experimental molecular and cell biology with experimental methods and theoretical ideas from the physical sciences.

In addition to funding for five research projects and two core facilities, the NCI grant also will provide funding to Northwestern investigators and potential collaborators at other PS-OCs across the nation for new interdisciplinary pilot projects that relate to the overarching theme of the Northwestern PS-OC.

The grant also will fund multidisciplinary workshops, seminars and specialized programs for training the next generation of interdisciplinary physical scientists and clinicians.




Jonathan Widom

The Chemistry of Life Processes Institute and the Lurie Cancer Center will provide administrative infrastructure and many specialized core instrumentation facilities to create a fertile interdisciplinary environment for the scientific teams, helping to advance both the fundamental science and its clinical application.

More information about the Physical Science-Oncology Centers program can be found at <http://physics.cancer.gov>.

More news about Northwestern at the [NewsCenter](#).

Megan Fellman is the science and engineering editor. Contact her at fellman@northwestern.edu

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Northwestern University NewsCenter 533 Clark Street Evanston, IL 60208-1230 Evanston: 847.491.5001 news@northwestern.edu