

Scientist studies DNA repair; hopes to improve breast cancer treatment

January 16 2013, by Elizabeth K. Gardner

(Medical Xpress)—A Purdue University scientist is studying the way cells repair damaged DNA in the hopes of making cancer cells more susceptible to treatment and normal tissue better able to withstand it.

The National Institutes of Health recognized Pierre-Alexandre Vidi and his research with a Howard Temin Pathway to Independence Award in Cancer for highly promising postdoctoral research scientists. This is the first time a [postdoctoral researcher](#) has received the award while at Purdue. The [National Cancer Institute](#) issued the award to 60 researchers in the United States in 2012.

Vidi uses a 3-D cell culture to reproduce [mammary glands](#) and breast cancers with the architecture they would have within the human body. He then studies how cells' organization and interactions influence the process of DNA repair.

"Our ultimate goal is to improve cancer treatment and the quality of life of cancer patients," Vidi said. "We want to learn how to make cancer cells less able to repair themselves after chemotherapy or [radiation treatment](#). This could reduce treatment doses - and the debilitating side effects of those treatments - the patients must endure."

A better understanding of what influences DNA repair could also lead to strategies to boost DNA repair in normal cells and prevent cancer initiation, he said.

Vidi's findings suggest that [tissue architecture](#) influences the organization of the [cell nucleus](#) and nuclear processes such as DNA repair. He will use the grant to further investigate the underlying mechanisms and how the organization of normal and [cancer cells](#) influences the flow of information that leads to DNA repair.

Vidi's research approach differs from most other cancer researchers due to the inclusion of healthy [tissue models](#) in parallel to cancers in his studies. He credits his mentor, Sophie Lelièvre, as a leader of this approach. Lelièvre is an associate professor of basic medical sciences in Purdue's College of Veterinary Medicine and associate director of discovery groups in the Purdue Center for Cancer Research.

"Her laboratory is famous for approaching cancer research by first understanding normal tissue behavior," Vidi said. "Dr. Lelièvre's group also is one of the few in the world able to reproduce the complex organization of cells that line the mammary ducts and create 3-D cell culture models."

Vidi's Pathway to Independence Award comes through the National Cancer Institute at the NIH. The competitive award was created in 2007 and provides five years of support comprising two years of mentored support as a postdoctoral fellow followed by three years of support as an independent researcher. In addition to Lelièvre, Vidi's mentors include Joseph Irudayaraj from Purdue's School of Agricultural and Biological Engineering and Tom Misteli from the National Cancer Institute.

"Pierre's training and the mentors he has sought bridge expertise in cancer biology and in biophysical technologies that are the future of this field," said Lelièvre, who also leads the International [Breast Cancer](#) and Nutrition Project. "He shows tremendous promise as a scientist and cancer researcher and carries the torch of our laboratory's values."

Provided by Purdue University

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