

Cores: Shared facilities give all Jonsson Cancer Center researchers access to a vast array of technologies in their fight against cancer

❖ Small Animal Imaging

Molecular imaging of small animals allows scientists to make non-invasive measurements as they follow tumor development and response to therapy.

❖ Gene Expression

Allows scientists to do molecular profiling for all genes in a category. Using this technique, researchers can identify genes that distinguish normal cells from tumors and genes that distinguish among different classes of tumors.

❖ Proteomics

Allows investigators to determine the identity and levels of a large number of proteins in normal and tumor cells, and compares the different proteins in a tumor to one another. Also allows investigators to ask how proteins are modified in cells as a consequence of normal and abnormal signals impinging on cells.

❖ Immunology

Specializes in experiments that evaluate the function of immune-system cells called lymphocytes.

❖ Tissue Array

Constructs and analyzes arrays of tumor tissue samples for research programs. Tumors are analyzed for common biological properties that distinguish them from normal tissue and one another and provide targets for detection and/or therapy.

❖ Family and Genetic Evaluation

Establishes a registry of high-risk individuals and families whose informed consent participation may contribute to other genetic and non-genetic research studies.

❖ Patient Recruitment, Retention and Communications

Develops institutional capabilities that can facilitate informed, culturally-appropriate and ongoing communication about clinical trials at UCLA's Jonsson Cancer Center and the diverse populations of the Los Angeles area, including hard-to-reach ethnic, socio-economic and historically under-represented communities.

With the renewal of the National Cancer Institute's core grant, UCLA's Jonsson Cancer Center has been able to fund, for the next five years, seven new facilities that will allow cancer center investigators to stay on the leading-edge of science.

"One of the key things that the cancer center does is it enables its faculty to make discoveries. Our core facilities give them access to very modern, expensive technology to enable them to be successful and to facilitate their work," said Dr. Leonard Rome, senior associate dean for research and co-director of the Cancer Cell Biology Program Area.

The new facilities augment the cancer center's existing shared resources core that supports research. Shared resources come in two forms. One type of facility provides economies of scale and quality control to relatively simple laboratory processes.

"The whole idea of these shared resources is that they provide a 'one-stop-shopping' service for the investigators that makes doing their science easier and makes them more productive. Everyone doesn't have to reinvent the wheel," said Harvey Herschman, director of basic research at UCLA's Jonsson Comprehensive Cancer Center.

The second type of shared resources provides access to technically complex equipment that is expensive and requires more sophisticated knowledge, both for operation and for interpretation of the data.

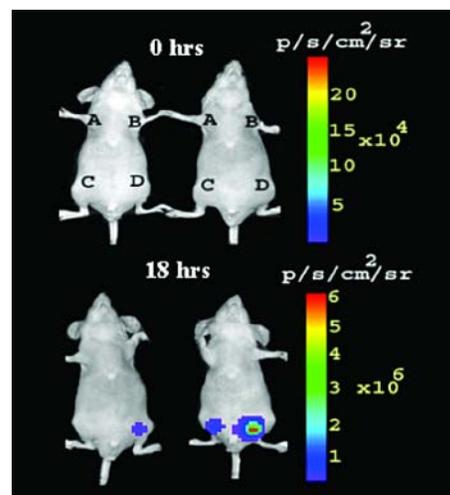
"In preparing for our last core grant renewal, we decided it was important to provide access to technology that is not otherwise available to cancer center members," Herschman said, adding that the new core resources emphasize technologies that are demanding experimentally and intellectually, often have very expensive equipment and for which there is no commercial alternative available.

"We set up core facilities with the kind of equipment that can be shared and is much too expensive for the average faculty member to have in their own lab," Rome added.

Newly funded shared resources for 2003 include small animal imaging, gene expression, proteomics, immunology, tissue array, family and genetic evaluation, and patient recruit-

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ment, retention and communications cores.

"These technologies help us to move our science forward. They are all tools that have been developed in the last five or six years and are techniques that enable us to do science that couldn't be done before," Herschman said.

For example, scientists have developed a small animal imaging center at UCLA. They put the gene from a firefly that makes it glow into a tumor cell in an animal. The tumor cells will then light up and researchers are able to watch and track the progression of the disease inside the animal. By placing the firefly's gene in the DNA of a mouse, but arranging the DNA so that this gene is only turned on when a cell in the mouse becomes cancerous, UCLA scientists can actually "see" the initiation of a tumor, its growth and metastasis and its response to therapy.

“It’s like using a molecular Lojack,” Herschman said. “This technique allows us to do experiments that could never be done before. Plus, it is more cost efficient and it is non-invasive.”

The proteomics core was first envisioned as part of the school of medicine’s strategic plan in 1999.

“A proteomics facility is a place that can help you isolate and identify a protein. It can help you determine if a protein is a known protein by getting its sequence. If it is a new protein, it helps you understand what that protein sequence is so you can eventually go after the gene.” Rome explained. “The difference between normal and cancer cells is some difference in the expression of their genes and the products of gene expression are proteins. Proteomics really comes down to understanding the different proteins that are made by the different cells.”

In the future, the cancer center will be adding additional resources, including a chemical genomics lab. The chemical genomics core will make chemical library screening available to faculty studying small-molecule inhibitors and the discoveries made through chemical genomics will become a starting point for developing new cancer drugs.

“This will be great tool for our researchers because small molecule inhibitors will help them understand the mechanisms of action for the enzymes and the proteins that they’re studying,” Rome said.

The cancer center’s support of shared resources enables scientists to make discoveries they could never make before.

“We are very grateful to the Jonsson Cancer Center Foundation, which provided us with the resources to start these programs, to demonstrate that we can make them work, that they are needed at UCLA and that they improve the opportunities to do leading edge research,” Herschman explained. “Without the philanthropic component of our cancer center, we could never initiate these shared resources. We have to be able to buy the equipment. We have to be able to hire the technical people and train them to run the facilities. Without the kind of commitment from the institution and resources from philanthropy to do the proof of principle for each of these resources, we would not be able to demonstrate to the National Cancer Institute that we have a critical need for them and that they contribute to our research. Our donors are a hugely important component of our cancer center.” ☆