



'DISEASE-IN-A-DISH' ADVANCES CANCER RESEARCH

Approach of Alan Moy, MD, and colleagues holds promise for patients

WE OFTEN HEAR cancer "breakthroughs" proclaimed in the news, only to see disappointment follow in the long-term results. Indeed, "Cancer is one of the most challenging diseases to overcome," says Alan Moy, MD, pulmonologist and Scientific Director of the John Paul II Medical Research Institute (JPIIMRI).



Alan Moy, MD

A member of the Mercy medical staff since 2005, Dr. Moy sees patients with lung diseases in the practice Pulmonary Associates of Iowa City, PC. He also spends hours at the JPIIMRI looking for another way to help patients—developing highly accurate, personalized cancer treatments.

Dr. Moy and his research colleagues are creating dozens of miniature cancer tumors in the lab—tumors grown from a patient's own cancer cells. They then test multiple therapies in multiple combinations on the miniature tumors to see which therapies are most effective. He calls it the "disease-in-a-dish" model.

IT STARTS WITH STEM CELLS Cancer biology is complex, and growing cancer cells has been an enormous challenge, says Dr. Moy. This is where cancer stem cells enter the picture.

A stem cell is a kind of body cell that is able to develop into any other kind of cell (and there are more than 200 kinds of cells in the body). You might call it a master cell.

Stem cells can also be the driving force for causing cancer. Cancer is caused by cancer stem cells, which are responsible for their resistance to radiation and chemotherapy and for why cancer can relapse and metastasize.

Dr. Moy and his colleagues have focused on obtaining cancer stem cells in two different ways: harvesting cancer stem cells directly from cancer tumors (about 2 percent of a tumor's cells are cancer stem cells) and "genetically reprogramming" regular tumor cells, thus reverting them back to cancer stem cells. Once the tumor stem cells are obtained, they are used to grow three-dimensional solid tumors in a lab dish—copies of an individual's cancer.

"It's well-recognized that no two cancer patients are the same in terms of the biology of their cancer," Dr. Moy says. "Clinical trials provide guidelines for the 'average' patient, not each unique patient."

THE GOAL FOR PATIENTS With these miniature copies of a patient's tumors, different combinations of therapies can be tested. The goal: to learn which treatment is most effective, with the fewest side effects, for an individual patient.

Breast, colorectal, lung, bladder, head and neck, and brain tumors best lend themselves to Dr. Moy's approach. Mercy patients have taken part in Dr. Moy's research since 2005 by donating cancer tissue.

"This approach helps bridge the gap between drug development and clinical trials," Dr. Moy says. "It's very efficient, very cost-effective. It has the promise of providing a very high level of precision. Most of all, it can help give patients access to the therapies that have the most promise for their individual situations."

JPIIMRI is a not-for-profit research organization focused on the most ethical and cost-effective ways of conducting research to develop therapies for a variety of diseases. For more information, visit www.jp2mri.org.

IOWA CITY COUPLE SHARES CANCER EXPERIENCE

LIKE ANY MARRIED couple, Ken and Keli Shropshire, of Iowa City, are happy to share many things.

But they also share something most people would choose to avoid: a cancer diagnosis.

Just as Ken was completing treatment for bladder cancer in 2014, Keli was diagnosed with cancer. In fact, Ken brought Keli to his last appointment at Cancer Care of Iowa City and asked oncologist Scott Miller, MD, to begin treating his wife.

"Incredible facilities and wonderful people," says Ken

of his experience.

"I knew that Ken had a good experience [with Mercy]," says Keli. "And I discovered how caring and compassionate caregivers can be."

The Shropshires were the featured speakers at Mercy Cancer Survivors Day 2015, held in Mercy's atrium in April.

"This has given me more self-awareness," says Keli of her experience. "It has given me a chance to see how deep my resources go."



Mercy Iowa City is accredited as a
Comprehensive Community Cancer Program
by the
American College of Surgeons Commission on Cancer

KNOW YOUR FATS

MONOUNSATURATED



HEALTHY
May help lower cholesterol.
Good source of vitamin E.

RECOMMENDED AMOUNT
In moderation.

POLYUNSATURATED



HEALTHY
May help lower cholesterol.
Good source of omega-6
and omega-3 fatty acids.

RECOMMENDED AMOUNT
In moderation.

SATURATED



UNHEALTHY
Can raise cholesterol.

RECOMMENDED AMOUNT
Less than 7% daily.

TRANS-FATTY ACIDS



UNHEALTHY
Can raise cholesterol.

RECOMMENDED AMOUNT
Less than 1% daily.

Total fat intake should be
between 25 and 35 percent
of daily calories.

Sources: Academy of Nutrition and
Dietetics; American Heart Association