

# Understanding the pathways that lead to cancer

under the  
microscope

by LISA SPELLMAN



Although it pains Rene Opavsky, Ph.D., to see patients in hospital corridors, it is precisely why he spends hours in the laboratory tackling the same question in ways new and different.

"You can just see the suffering," Dr. Opavsky said. "It makes me sad to see, especially when it comes to children."

That is why Dr. Opavsky chose to help mankind as a scientist.

An assistant professor in the Eppley Institute, Dr. Opavsky recalls how he studied chemistry in a Slovakian middle school and came across a book about cancer, including what it was and its causes. At age 13, he was hooked into finding answers that would help the patients he now passes in hospital hallways.

"In principle, science doesn't have any limits," he said. "You can attack a problem like leukemia or lymphoma and really try to make a difference in people's lives."

"Dr. Opavsky is an important addition to the lymphoma research program in the Eppley Cancer Center, one of the strongest clinical programs at UNMC," said Eppley Cancer Center Director Ken Cowan, M.D., Ph.D. "He brings valuable expertise in using animal models to study the mechanisms of lymphoma development

and progression and is particularly interested in understanding the epigenetic pathways involved in malignant transformation." Epigenetic is a change that affects a cell, organ or individual without directly affecting its DNA.

Dr. Opavsky came to UNMC in 2008 from Ohio State University, where he completed his postdoctoral fellowship in the division of human cancer genetics. His research focuses on understanding the two most frequent changes that occur in human cancers related to a person's DNA and their genetics.

The most frequent genetic change in human cancer occurs in the DNA sequence of genes that belong to a certain protein pathway called retinoblastoma. The second most frequent change is a chemical modification of DNA called methylation. This has a tremendous influence on the way genes from DNA are regulated.


He is particularly interested in leukemia because, as the most common form of cancer in children, it accounts for about one-third of all childhood cancers.

In the lab, Dr. Opavsky uses a unique mouse model to artificially turn on or turn off genes in their blood cells to determine if certain changes can be used as therapy.

Understanding the pathways healthy cells take to become a leukemia or lymphoma cell is an increasingly important area of cancer research, Dr. Cowan said, because it focuses on the mechanisms that cancer cells use to alter the regulation of expression of genes that cause cancer development.

"With new agents already in the clinic which directly affect epigenetic control mechanisms, Dr. Opavsky's research will provide important insights into how to use these agents to treat and prevent lymphomas," he said.

Dr. Opavsky appreciates the collaborative atmosphere that exists at UNMC, where his wife, Jana Opavska, manages his lab. The couple agrees the research environment, plus Dr. Opavsky's childhood resolve to help cancer patients, is a combination that bodes well for scientific discoveries that can make a difference to patients.

"I can't just watch people suffer. As cancer biologists, we have to find new ways to help" he said. 

**Dr. Rene Opavsky's compassion for human suffering led him to a career in science. He studies leukemia because it accounts for one-third of all childhood cancers.**

