New Drug Helps Radiation Kill Prostate Cancer

An experimental drug appears to pack a one-two punch against some prostate cancers, significantly slowing the increase of cancer cells and making them more vulnerable to radiation.

The drug, tested in laboratory cell cultures and animals, works by targeting abnormally high levels of a protein linked to cancer growth. The findings could advance the search for new combination treatments that make radiation safer and more effective against prostate cancer.

The disease is the most common non-skin cancer in men and the second-leading cause of cancer-related deaths in men in the United States.

“A lot of work still needs to be done to develop this into a chemotherapy drug,” says Venu Raman, associate professor of radiology and radiological science and of oncology at the Johns Hopkins University School of Medicine. “But based on our findings, we think it could fill an unmet need in making the most common treatment for prostate cancer more effective.”

This marker may flag aggressive prostate cancer

Radiation is a first-line therapy and generally is considered for all but the most advanced of the nearly 200,000 cases of prostate cancer diagnosed each year in the United States. Some of these cancers, however, become resistant to radiation treatment over time, Raman says.

In a search for ways to extend the value of radiation and limit collateral damage to healthy tissue from high radiation doses, Raman worked with Phuoc Tran, a radiation oncologist and, like Raman, a member of the Johns Hopkins Kimmel Cancer Center.
They and colleagues from Johns Hopkins and University Medical Centre Utrecht had earlier discovered that a protein called DDX3 appears to be “dysregulated” in many cancers, including breast, lung, colorectal, sarcoma, and prostate. The researchers found that the more aggressive the cancer, the higher the expression of this protein, which helps maintain cellular stability.

The researchers designed a molecule—called RK-33—to disrupt DDX3’s function by locking onto a portion of the protein. They have shown in cell cultures that adding RK-33 to malignant lung and other cancerous cells that highly express DDX3 slowed or halted multiplication of the cancer cells.