Study shows role of enzyme in prostate cancer growth

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Pei Chuan Li, left, and Jean C. Shih are researching the role of a specific enzyme in treating prostate cancer. Credit: Isaac Mora

A new USC School of Pharmacy study led by University Professor Jean Chen Shih offers new evidence that the monoamine oxidase-A enzyme (MAO-A) pathway could be an important target in treating prostate cancer.

Pioneering work previously conducted by Shih revealed the role the MAO-A gene plays in depression and other mental illnesses, as well as autism and aggression.

Research has shown increased MAO-A expression in prostate cancer, glioma and classical Hodgkin lymphoma. Yet the biological function of MAO-A in cancer development remained unknown—until now.

In a study published in *Oncogene*, Shih and her co-investigators examined the role MAO-A plays in the progression of prostate cancer. The findings show that inhibition of MAO-A expression reduces prostate cancer development by decreasing cell proliferation and cancer stem cells.

Because MAO-A inhibitors are successfully being used to treat other diseases linked to this enzyme, such as depression, Shih and her collaborators believe the right inhibitors also hold the potential and in treating prostate cancer and reducing prostate cancer growth.

"We've found MAO is increased in prostate cancer, glioma and lymphoma. In these cancers, we think the patient may benefit by treatment with MAO inhibitors," explained Shih, who holds the Boyd P. and Elsie D. Welin Professorship in Pharmaceutical Sciences and serves as director of the Center for USC-Taiwan Translational Research. "We are eager to pursue preclinical and clinical studies."

Treating prostate cancer with antidepressants

According to the American Cancer Society, more than 29,000 deaths from prostate cancer will occur in 2018, putting the disease just behind lung cancer as the leading cause of cancer death in American men. One in nine men will be diagnosed with prostate cancer during his lifetime.

"The results of this study are significant as they suggest that the MAO-A pathway is an important target in prostate cancer," said study co-author Mitchell Gross of the Keck School of Medicine of USC. "This is especially exciting because MAO inhibitors are already FDA-approved

and available to treat depression."

The results are being tested now in human clinical trials as prostate cancer patients receive treatment with MAO inhibitors (phenelzine sulfate). The preliminary data are promising, Shih noted.

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