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Protein predicts breast cancer prognosis

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Researchers have identified a protein that they believe may help predict breast cancer prognosis, potentially relieving thousands of women at low risk from having to undergo painful, oft-debilitating therapies, while insuring the most successful treatments for those at high risk. The research was published ahead of print in the journal *Molecular and Cellular Biology*.

Using bioinformatics techniques, the authors showed that the levels of expression of some 1,200 genes that are directly controlled by the enzyme, EZH2, correlates with the aggressiveness of breast cancer cases.

"The analysis pipeline that we developed will be useful for stratification of breast cancer patients," says Elizaveta V. Benevolenskaya of the University of Illinois at Chicago, a researcher on the study. "That stratification will enable clinicians to accurately predict breast cancer progression. The level of expression of a subgroup of EZH2-bound genes could have further predictive value, indicating, for example, that a specific treatment regime is needed."

In the study, she and her collaborators generated breast cancer cells in which they could dampen expression of EZH2 using a technique called RNA inhibition. Inhibiting EZH2 expression reactivated the genes this enzyme controls, which resulted in less aggressive cancer phenotypes.

In addition to predicting aggressiveness, Benevolenskaya says small molecule inhibitors of EZH2, which have recently become available,

could be developed as therapeutic drugs for breast cancer. The advantage of small molecules is that they are cheaper to manufacture, and generally can be taken by mouth, unlike larger molecules, which must be given by injection.

Besides breast cancer, EZH2 overexpression appears to be associated with a worse prognosis in prostate, endometrial, and melanoma tumors. The computational analysis used in their research could also be helpful for predicting the aggressiveness of these and other cancers, says Benevolenskaya.

More information: A copy of the manuscript can be found online. Formal publication is scheduled for the October 2013 issue of *Molecular and Cellular Biology*.

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