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Pure form of tumor protein extracted successfully

by [neha gupta](#) - August 24, 2010

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After a decade and a half of continuous research, biochemists have finally succeeded in extracting a pure form of the tumor suppressor protein BRCA2 from human cells.



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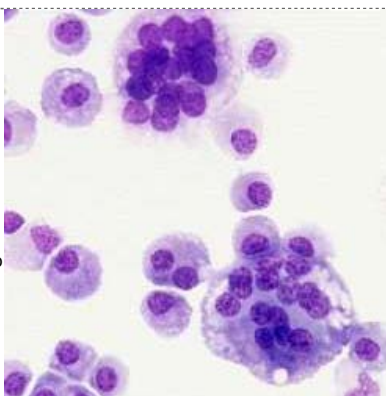
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The feat which was performed individually in 3 different labs proves how the protein keeps [tumors](#) in check.

It further gives an insight into how in the BRCA2 sequence causes [cancer](#) and paves way for research on compounds that could block this destructive process.



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Some mutations in the gene coding for BRCA2 enhances the probability that a person will develop breast, ovarian and other [types of cancer](#) in the future, reveal researchers.

The studies

Stephen Kowalczykowski, a biochemist at the University of California, and his team purified the protein by adding a maltose-binding protein tag to one end of the [BRCA2](#) protein.

The tag helps enhance the solubility of the protein and promotes proper protein folding, hence stabilizing it.

Finally, the protein was extracted in its pure form from cultured human epithelial kidney cells.

"Ryan Jensen, a postdoc in Kowalczykowski's lab and the first author on the Nature paper¹, spent four years simply optimizing the purification process", Kowalczykowski says.

In the second lab, a different approach was used by researcher Wolf-Dietrich Heyer, a biochemist at the University of California, and his team. They expressed the protein in the yeast and extracted the protein successfully.

In the third study, led by Stephen West, a geneticist at Cancer Research UK in London, BRCA2 gene was inserted into cultured human epithelial [cancer cells](#) as part of a bacterial construct.

Eventually, tags were added to the proteins in order to help purify them easily.

With the protein in hand, scientists can now "do all types of mechanistic experiments" that have so far eluded researchers, says Patrick Sung, a biochemist at Yale University in New Haven, who was not involved in the study.

"The significance is enormous," he says, "not only in understanding how BRCA2 works, but also in providing a framework for working with other [proteins](#) known to interact with it."

The findings are published online in 'Nature¹' and 'Nature Structural & Molecular Biology.'

Barriers to the extraction

The major difficulty faced by the teams was the size of the protein which clocked in at 3,418 amino acids.

"That is really huge," says Heyer. "I'm not aware of any other proteins that size that have been purified to homogeneity."

Secondly, BRCA2 is extremely unstable on its own, and commonly exists in complexes with other proteins due

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to which it gets difficult to extract it in its pure form.

"People have got it partially purified, but the question has always been contamination," Kowalczykowski says. "You really need to get it squeaky clean, and that has been the major stumbling block."

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Last edited by [Silky Chandvani](#) on Tue, 08/24/2010 - 09:49 | Write to author: [neha gupta](#) | [SHARE](#)

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IN FOCUS

7 Cancer Symptoms Men Tend to Ignore

Men often tend to delay health checkups until they have symptoms. But they need to get real and aware of anything that's different to keep cancers at bay.

by Lisa Anderson - April 21, 2010



Besides annual checkups and tests, which are as important, sometimes, it's just equally important to pay attention to your body and notice anything that's odd or unexplainable.

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Causes and Remedies of Bad Breath

Bad breath is one of the biggest put off. Why live with it when you can easily get rid of it?

by Dr. Sania Siddiqui - May 4, 2010



Halitosis or bad breath is not an uncommon problem amongst people. But we are either ignorant of its causes or don't pay much attention to the unintentional inconvenience that we cause people around us.

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Go the Organic Way

What is it about organic food that is luring people in large numbers? Themedguru finds out.

by Gunjan Mehra - August 3, 2010



Did you know that in spite of washing it repeatedly, an apple can have around 30 different types of pesticides on it, waiting to find their way into your digestive system?

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