

How does pregnancy reduce breast cancer risk?

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Being pregnant while young is known to protect a women against breast cancer. But why? Research in BioMed Central's open access journal *Breast Cancer Research* finds that Wnt/Notch signalling ratio is decreased in the breast tissue of mice which have given birth, compared to virgin mice of the same age.

Early pregnancy is protective against breast cancer in humans and in rodents. In humans having a child before the age of 20 decreases risk of breast cancer by half. Using [microarray analysis](#) researchers from Basel discovered that genes involved in the immune system and differentiation were up-regulated after pregnancy while the activity of genes coding for growth factors was reduced.

The activity of one particular gene Wnt4 was also down-regulated after pregnancy. The protein from this gene (Wnt4) is a feminising protein - absence of this protein propels a foetus towards developing as a boy. Wnt and Notch are opposing components of a system which controls cellular fate within an organism and when the team looked at Notch they found that genes regulated by notch were up-regulated, Notch-stimulating proteins up-regulated and Notch-inhibiting proteins down-regulated.

Wnt/Notch signalling ratio was permanently altered in the basal stem/progenitor cells of mammary tissue of mice by pregnancy. Mohamed Bentires-Alj from the Friedrich Miescher Institute for Biomedical Research, who led this study explained, "The down-

regulation of Wnt is the opposite of that seen in many cancers, and this tightened control of Wnt/Notch after pregnancy may be preventing the runaway growth present in cancer."

More information: Parity induces differentiation and reduces Wnt/Notch signaling ratio and proliferation potential of basal stem/progenitor cells isolated from mouse mammary epithelium, Fabienne Meier-Abt, Emanuela Milani, Tim Roloff, Heike Brinkhaus, Stephan Duss, Dominique S Meyer, Ina Klebba, Piotr J Balwierz, Erik van Nimwegen and Mohamed Bentires-Alj, *Breast Cancer Research* (in press)

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