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Notch-ing up cancer genes

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Notch receptor signalling has been implicated in cell-fate decisions and differentiation in a variety of tissues. In an Advanced Online Publication in Nature Genetics Nicolas *et al.* define a tumour suppressor function for the mouse *Notch1* gene (*Nature Genetics*, 18 February 2003, doi:10.1038/ng1099). As *Notch1* is essential for embryonic development, they used a tissue-specific inducible gene-targeting approach to specifically delete the *Notch1* gene in the skin. *Notch1* ablation led to epidermal hyperproliferation and the development of basal cell carcinoma-like tumors. This was unexpected as active Notch signalling has been shown to cause tumors in other tissues. The *Notch1*-less mice were also susceptible to chemically induced carcinogenesis. Tumors lacking Notch1 were associated with decreased levels of the cyclin dependent kinase inhibitor $p21^{Cip1}$ and elevated levels of the transcription factor Gli2 and components of the β-catenin/Wnt signaling pathway.

References

1. Notch signaling: cell fate control and signal integration in development.

2. *Nature Genetics*, [http://www.nature.com/naturegenetics]