▶ EPIGENETICS

Going places with *BANCR*

A screen for transcripts affected by the expression of the oncogene *BRAF*^{V600E} has identified a long noncoding RNA (lncRNA) as being crucial for melanoma cell migration.

Paul Khavari and colleagues carried out massively parallel cDNA sequencing (RNA-seq) on normal melanocytes, normal melanocytes expressing ectopic *BRAF*^{V600E} and *BRAF*-mutant melanoma samples. By comparing the findings from the normal melanocytes with and without *BRAF*^{V600E} with the *BRAF*-mutant melanomas, the authors identified 1,027 protein-coding transcripts, 39 lncRNAs and 70 intragenic RNA transcripts that were altered by expression of *BRAF*^{V600E} and that were expressed in melanoma samples. Analysis of the 70 intragenic transcripts indicated that many were likely to be lncRNAs and further comparisons with publicly available databases of RNA transcripts altered in melanoma showed that one lncRNA was often highly upregulated by *BRAF*^{V600E} expression. The authors named this transcript *BRAF*-activated noncoding RNA (*BANCR*) and established that it is a four-exon transcript of 693 bp that is found in a 60 kb gene desert region on chromosome 9. The genes proximal to *BANCR* are not altered by changes in *BANCR* expression, indicating that this lncRNA is not a *cis* regulator of neighbouring genes.

BANCR expression is mostly restricted to melanocytes, and short hairpin RNA (shRNA)-mediated knockdown of *BANCR* in melanoma cells resulted in a change in the expression levels of 88 genes, many of which were found to be involved in cell migration and chemotaxis. Indeed, *BANCR* depletion impaired the migration of melanoma cells *in vitro*, but had no effect on their survival or proliferation. Addition of the chemokine CXCL11, one of the mRNAs downregulated when *BANCR* was depleted, was able to rescue the defective migration of *BANCR*-depleted melanoma cells.

The authors suggest that other lncRNAs could be identified using this approach of comparing genetically modified normal cells with appropriate tumour samples to enrich for transcripts that are relevant to the cancer type of interest.

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ORIGINAL RESEARCH PAPER Flockhart, R. J. et al. *BRAF*^{V600E} remodels the melanocyte transcriptome and induces *BANCR* to regulate melanoma cell migration. *Genome Res* 16 May 2012 (doi:10.1101/gr.140061.112)