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Brk expression may affect the differentiation status of breast cancer cells

AJ Harvey[1], CJ Pennington[2], DR Edwards[2], SA Eccles[3], MR Crompton[4]

[1]Biosciences Brunel University, Uxbridge, UK; [2]School of Biological Sciences, University of East Anglia, Norwich, UK; [3]Cancer Research UK Centre for Cancer Therapeutics, Institute of Cancer Research, Sutton, UK; [4]School of Biological Sciences, Royal Holloway, University of London, Egham, UK

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The breast tumour kinase Brk (PTK6) is found in over two-thirds of breast cancer cell lines and tumours but is not expressed in normal mammary cells. Brk has previously been shown to play a role in regulating proliferation in breast tumour cells [1]. However, *in vivo*, the site of Brk expression in normal tissues is restricted to nonproliferating cells that are undergoing terminal differentiation such as those in the gut or the skin [2,3]. This led us to hypothesise that Brk expression in breast tumours could be reflective of a differentiation phenotype, especially as a previous study had shown that involucrin, a marker of terminal keratinocyte differentiation, was expressed in a subset of tumours [4]. We therefore examined involucrin expression in breast tumour cells lines and patient biopsy samples. In addition we investigated whether inducers of differentiation in keratinocytes such as prolonged culture in suspension or vitamin D3 treatment could also affect differentiation of breast tumour cells.

We found that the expression of Brk in cultured cell lines correlated with involucrin expression. In addition the change in Brk expression, as a result of culture conditions, was accompanied by a change in involucrin levels. Moreover, treatment with vitamin D3 resulted in a decrease in cell numbers in the Brk-positive cell lines relative to the control treatments. The Brk-negative cell line was unaffected by vitamin D3 treatment.

These data suggest that Brk and involucrin may be coregulated and that inducers of differentiation such as vitamin D3 could be considered potential therapeutic strategies.

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