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BREAST CANCER

Epithelial–mesenchymal transitions in human breast cancer samples

Studies in preclinical models have indicated that the aberrant activation of epithelial–mesenchymal transition (EMT) is involved in tumour metastasis. To confirm the clinical relevance of this hypothesis, researchers led by Daniel Haber and Shyamala Maheswaran have analysed EMT in circulating tumour cells (CTCs) in patients with breast cancer.

The researchers used a dual colourimetric RNA-*in situ* hybridization assay to identify the E (epithelial) and M (mesenchymal) states in primary breast tumour samples and CTCs from patients with metastatic breast cancer. Among the majority of E-positive cancer cells in the primary tumour, a minor population simultaneously expressed E/M markers. By contrast, the M state was found to be enriched in the CTCs obtained from 17 patients with metastatic breast cancer.

Further analysis was performed on CTCs from 11 patients post-treatment. A decrease in CTC number and/or a decrease in M-positive CTCs was observed in six patients who responded to therapy. The five patients who did not respond showed an increase in M-positive CTCs, indicating there is a dynamic fluctuation between the two states depending on the response to therapy.

This study supports a role for EMT in metastasis. Maheswaran believes that "monitoring EMT in CTCs could represent a method to monitor tumour progression, and suppressing this transition could sensitize these metastatic intermediates that seed at distant sites."

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Original article Yu, M. *et al*. Circulating breast tumor cells exhibit dynamic changes in epithelial and mesenchymal composition. *Science* **339**, 580–584 (2013)