PAC, a novel curcumin analogue, has anti-breast cancer properties with higher efficiency on ER-negative cells

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Abstract

We have investigated here the anti-breast cancer properties of two novel curcumin analogues, EAC and PAC. Apoptosis was assessed by the annexin V/propidium iodide (PI) assay on different breast cancer and normal cells. Immunoblotting analysis determined the effects of these agents on different apoptotic and oncogenic proteins. Furthermore, flow cytometry and Elispot were utilised to investigate the effects on the cell cycle and the production of cytokines, respectively. Breast cancer tumour xenografts were developed in nude mice. Finally, 18F-radiolabeled PAC and curcumin were produced to study their bioavailability and tissue biodistribution in mice. PAC is five times more efficient than curcumin and EAC in inducing apoptosis, mainly via the internal mitochondrial route. This effect was 10-fold higher against ER-negative as compared to ER-positive cells, and ectopic expression of ERa rendered ER-negative breast cancer cells more resistant to PAC.

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