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# Effects of aluminium salts and cyclic volatile methylsiloxanes on DNA damage and DNA repair in immortalised non-transformed human breast epithelial cells

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Dermal absorption of components of underarm cosmetics may be a contributory factor in breast cancer development. Aluminium (Al) salts are added as the active antiperspirant agent, and cyclic volatile methylsiloxanes (cVMS) are used for purposes of conditioning and spreading. Al has been measured in human breast tissue, breast cyst fluid, nipple aspirate fluid and milk: Al levels in breast tissue have been recently reported to be a risk factor for breast cancer in young women. cVMS have been measured in human milk. The objectives of this study were to investigate any genotoxic effects of exposure to the antiperspirant salts Al chloride and Al chlorohydrate, and to the cVMS hexamethylcyclotrisiloxane (D3), octamethylcyclotetrasiloxane (D4) and decamethylcyclopentasiloxane (D5) in immortalised non-transformed human breast epithelial cells. All these compounds enabled a dose-dependent growth of the non-transformed cells in suspension culture, which is an established marker of transformation. DNA damage was demonstrated using a comet assay. Long term (≥20 weeks) exposure to these compounds also resulted in loss of expression (mRNA and protein) of the breast cancer susceptibility gene BRCA1 which is a key gene in repair of DNA in breast cells. Alterations to expression of other DNA repair genes at an mRNA level will be presented. If these compounds can both damage DNA and compromise DNA repair systems, then there is the potential for breast carcinogenesis.

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