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Inhibition of polysialylation- of neural cell adhesion molecule in the kelly neuroblastoma cell line by hexane extracts of the roots of *Withania somnifera*

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It has been known for several decades that alterations in glycosylation patterns play an important role in the metastasis of cancer cells but thus far few drugs have been developed specifically targeting these molecules. Polysialic acid (PSA) is a developmentally regulated cell-surface glycan consisting of sialic acid monomers attached by α-2,8-glycosidic linkages which, in mammals, is mainly expressed on neural cell adhesion molecule (NCAM). Polysialylated NCAM is abundant in embryonic tissues, and limited to areas of persistence of neuronal plasticity in adults. Up-regulation of PSA has also been reported in highly metastatic cancers where it appears to be associated with tumour progression. In this study we tested the ability of crude extracts of the Ayurvedic medicinal plants, namely *Withania somnifera* (ashwaghanda) and *Bacopa monnieri* (Brahmi), to inhibit PSA expression in several human tumour cell lines including TE671 rhabdomyosarcoma, Kelly neuroblastoma, 1321N1 brain astrocytoma and HCT colorectal carcinoma. Highest PSA signals, determined by ELISA, were observed in Kelly cells. Hexane extracts of roots of *Withania somnifera*, at doses that did not cause any cytotoxicity as determined by MTT assay, were found to cause 20-30% inhibition of PSA expression. To exclude the effect of counteracting constituents, we intend to fractionate the herbal extract to purify and characterise the compounds responsible for this inhibitory activity. We propose a therapeutic approach in which expression of glycans associated with tumour progression and metastasis could be inhibited by prolonged treatment with relatively non-toxic agents that do not target cell survival processes.

Biography

Nada Al-Hasawi graduated from the Faculty of Science at Kuwait University in 1995 with a degree of Biochemistry and subsequently an M. Sc. In 1999. She worked first as Scientific Assistant, then as Department Technician and then for 5 years as a Teaching Assistant in the Faculty of Pharmacy at Kuwait University before taking up a scholarship to study for a PhD at the Institute of Cancer Therapeutic at Bradford University, England. Following its completiion in 2008 she was appointed to her present position as Assistant Professor in Departmenmt of Pharmaceutical Chemistry, Faculty of Pharmacy at Kuwait University. Dr Al Hasawi's current interests focus on the role of polysialic acid in metastatic cancers.

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