

## **Tryptanthrin-induced growth inhibition and neuronal differentiation of human neuroblastoma cells in vitro**

**Xuemei Liao and Kwok-Nam Leung**

Biochemistry Programme, School of Life Sciences, The Chinese University of Hong Kong, China

Neuroblastoma, a tumor of the sympathetic nervous system, is one of the most common extracranial solid cancers in childhood. The prognosis of patients with advanced stages of neuroblastoma with N-myc amplification remains poor despite intense multimodality therapy, a situation that has called for alternative therapeutic approaches. "Differentiation therapy" makes use of a differentiation-inducing agent which induces tumor cells to undergo cellular differentiation and stop proliferation has attracted considerable interest in recent years. Tryptanthrin (6,12-dihydro-6,12-dioxindolo-(2,1-b)-quinazoline) is a weak basic alkaloid which can be isolated from the dried roots of medicinal indigo plants commonly known as Banlangen. It was found to exhibit anti-tumor effects on various kinds of cancer. However, its modulatory effects and action mechanisms on human neuroblastoma cells remain poorly understood. In this study, tryptanthrin was shown to suppress the growth of the human neuroblastoma LA-N-1 and SH-SY5Y cells in a dose- and time-dependent manner, but exhibited no significant direct cytotoxicity on normal cells. Mechanistic studies using the LA-N-1 cells indicated that tryptanthrin induced cell cycle arrest of the human neuroblastoma cells at the G0/G1 phase. Tryptanthrin also induced neuronal differentiation of LA-N-1 cells in a dose-dependent manner, as assessed by morphological criteria enhancement of acetylcholine esterase activity and up-regulation of various differentiation markers. Moreover, tryptanthrin treatment led to the reduction of N-myc expression in LA-N-1 cells. Collectively, our findings suggest that tryptanthrin might exert its anti-tumor effects on the human neuroblastoma cells by causing cell cycle arrest, inducing differentiation of the cancer cells and reducing N-myc expression. It might improve the therapy for high-risk neuroblastoma with N-myc-amplification.

### **Biography**

Xuemei Liao has completed her Master's degree from Guangzhou Institute of Biomedicine and Health, Chinese Academy of Sciences. She is a PhD candidate of the Chinese University of Hong Kong. Her supervisor is Professor Kwok-Nam Leung. She has published 3 papers in reputed journals.

[liao.xuemei123@gmail.com](mailto:liao.xuemei123@gmail.com)