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## Influence of the immunological effector IFN $\gamma$ in the biology of neuroblastoma cells

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The immune and nervous systems interact both at the cellular and molecular level, and share significant similarities in essential mechanisms and signaling pathways. IFN- $\gamma$ , a cytokine that belongs to type II interferons, plays crucial role in innate and adaptive immunity whereas its aberrant expression/activity has been associated with a number of autoimmune diseases. IFN $\gamma$  can enhance neurogenesis in the hippocampus of adult mice, by unknown mechanisms, possibly involving coordination between brain inflammation and repair, and can also modulate neurotransmitter release at synapses and affect memory, thereby revealing an important role of this immunological effector for the function of the adult nervous system. Using neuroblastoma cells, we are currently analyzing the influence of neuroinflammatory components in the process of aberrant activation of key signaling pathways involved in cellular proliferation and neuronal differentiation as well as in cellular heterogeneity, a hallmark of neuroblastoma which is observed in both tumors and tumor-derived cell lines. We found that IFN $\gamma$  reduces neuroblastoma cell proliferation by delaying progression through the S phase of the cell cycle. Concomitantly, it promotes molecular and morphological features of early neuronal differentiation as revealed by the extended neurite outgrowth, increased formation of varicosities, and induction of specific neuronal differentiation markers. Our data also showed that chronic treatment with IFN $\gamma$  alters the program of retinoic acid-induced differentiation, leading to an induction of large, nestin+, Schwann-like (S-type) cells, known to influence the biology of the adjacent neuroblastic (N-type) cells, suggesting that immune components may contribute to the phenotypic heterogeneity and tumorigenicity of neuroblastoma.

### Biography

Xagara Anastasia completed her degree in Biology at the University of Ioannina (Greece), Department of Biological Applications and Technologies (5-years, 300 ECTS). She is currently a PhD candidate in the Department of Biomedical Research, Institute of Molecular Biology and Biotechnology- Foundation for Research and Technology (FORTH/BRI), under the supervision of Assoc. Prof. Theologos Michaelidis. Her research is focused on the analysis of neuro-immune interactions that take place in human CNS and PNS and their significance for the development of neurological disorders.

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