

5<sup>th</sup> International Conference on  
**Brain Disorders and Therapeutics**  
&  
**Mental Health and Psychology**

November 05-06, 2018 | Edinburgh, Scotland

## Brain against Tumor: Could Brain Stimulation slow Cancer?

### Fahed Hakim

Technion- Israel Institute of Technology, Israel


The brain's reward system, specifically the dopaminergic neurons in the ventral tegmental area (VTA), constitutes a key neuronal network whose activation mediates positive emotions, expectations, and motivation. The dopaminergic projections from the VTA to components of the limbic system are causally associated with motivated behavior and reward perception. Pharmacological studies indicated a connection between reward system activity and immune modulation, and we recently showed that reward system activity can boost antibacterial immunity. Regulating immunity is also a leading target for cancer therapy. We found that activation of the reward system in tumor-bearing mice (Lewis lung carcinoma (LLC) and B16 melanoma) using chemogenetics (DREADDs), resulted in reduced tumor weight. This effect was mediated via the sympathetic nervous system (SNS), manifested by an attenuated noradrenergic input to a major immunological site, the bone marrow. Myeloid derived suppressor cells (MDSCs), which develop in the bone marrow, became less immunosuppressive

following reward system activation. By depleting or adoptively transferring the MDSCs, we demonstrated that these cells are both necessary and sufficient to mediate reward system effects on tumor growth. Given the central role of the reward system in positive emotions, these findings introduce a physiological mechanism whereby the patient's psychological state can impact anti-tumor immunity and cancer progression.

### Speaker Biography

Fahed Hakim is an Assistant Professor at the Faculty of Medicine at the Technion- Israel Institute of Technology, and the Director of the Nazareth E.M.M.S Hospital in Nazareth, Israel. Dr. Hakim also serves as a senior physician in the Pediatric Department, and Pediatric Pulmonary Institute at Rambam Health Care Campus – Haifa. He completed a postdoctoral fellowship in sleep medicine at the University of Chicago, Department of Pediatrics, Pritzker School of Medicine. And today he leads the cancer research center at the Nazareth E.M.M.S Hospital in collaboration with the Rolls lab at the Technion. His group focuses their research on specific neuronal networks in the brain (e.g. the reward system) and on general changes in brain activity (e.g. sleep ) and analyzes their effects on immune activity. His research achievements have been published in worldwide leading journals.

e: hakimfahed@gmail.com

 Notes: