You are cordially invited to a talk in the Edmond J. Safra Center for Bioinformatics Distinguished Speaker Series. The speaker is Simon Kasif, Professor of Biomedical Engineering, Computer Science and Bioinformatics, Boston University, USA

Title: "Towards a Network Biology Axis of Wellness and Disease Prevention: How to Live Happy and Healthy to 120".

Time: Wednesday January 3, 2018, at 11:15 sharp (refreshments from 11:00)

Place: Schreiber 309, School of Computer Science

Host: Prof. Ron Shamir, rshamir@tau.ac.il, School of Computer Science, TAU

Abstract: The vast majority of work in systems biology is focused on either basic biological processes (e.g., cell cycle or apoptosis) or systems biology of disease. These ideas created a major focus on modules (regulatory or protein complexes), master regulators and predictive network signatures of disease. This work is fundamental and already resulted in a number of seminal papers. In this talk we take a complimentary approach and focus on systems biology of disease prevention and wellness. This area is related to the study of aging and longevity but we define it broadly as a network study of health span. This “network axis of wellness” framework aims to produce a better understanding of why certain drugs, environmental conditions or food elements offer broad health benefits. It offers the possibility of explaining why certain individuals smoke like chimneys and resist getting cancer. Others exhibit all the classical symptoms of Diabetes but do not get any of the fatal complications. Many holocaust survivors end up living into their 90-s without developing major disease and of course the centenarians. We review our work in this area in the past 15 years. In addition to making multiple specific predictions with respect to genes and networks involved in health span this area refocuses our research efforts towards cross pathway networks that maintain global homeostasis. We provide an evolutionary perspective on the aim to develop a network based molecular axis of wellness and provide a computational complexity perspective that both challenges and complements traditional views on modularity. We describe the application of these ideas to Alzheimer’s, Major Depression, Cancer and Diabetes. These ideas barely touch the surface of a very promising research direction that can build on new ideas in network biology to unify so far disparate thought provoking and very promising results in epidemiology and molecular biology.