



181 Longwood Avenue
Boston, Massachusetts 02115-5804

Department of Medicine
Channing Division of Network Medicine

Channing Methods Seminar

July 30 (Friday), 2021, 11AM (ET)

<https://us02web.zoom.us/j/579497999?pwd=cHNIWHMzWUJFUUVJTG1EeVJmY05aQT09>

Meeting ID: 579 497 999

Passcode: 844168



Orr Levy, PhD

Department of Physics
Bar Ilan university

Age-related loss of gene-to-gene transcriptional coordination among single cells

A long-standing paradigm holds that stochastic aberrations of transcriptional regulation play a key role in the process of aging. While transcriptional dysregulation is observed in the majority of cell types in the form of increased cell-to-cell variability, its generality to all cell types remains doubted. Here, we propose a novel approach for analyzing transcriptional regulation in single-cell RNA sequencing (scRNA-seq) data by focusing on the global coordination between the genes rather than the variability of individual genes or correlations between pairs of genes. Consistently, across very different organisms and cell types, we find a decrease in the gene-to-gene transcriptional coordination in aging cells. In addition, we find that loss of gene-to-gene transcriptional coordination is associated with high mutational load of a specific, age-related signature and with radiation-induced DNA damage. These observations suggest a general, potentially universal, stochastic attribute of transcriptional dysregulation in aging.

Bio: I am a Physics Postdoc student in the lab of Prof. Shlomo Havlin in Bar Ilan university, and the head of C4I branch in the Israeli defense industry, in charge of data mining and data engineering. My Postdoc study is in the field of complex networks focusing on "real-world" problems. In my current research, I am analysing the structure and function of interactions, communities and stability in complex networks and their implications in real networks. My main interest is in the study of biological and physiological systems.

Hosted by Yang-Yu Liu