Research Interests

Italo Tempera Ph.D.

The laboratory of Dr. Tempera studies the impact of EBV infection on the 3D structure of the host genome. Viruses co-opt cellular mechanisms that control transcription and the 3D chromatin structure is an important regulator of transcription. However, the impact of viral infection on the host 3D chromatin structure is un-explored and under-appreciated. They showed that the PARP1/CTCF axis influences chromatin structure during infection. Whether, EBV co-opts PARP1 to alter the 3D structure of the *host* genome, by changing the ability of CTCF to bind *host* DNA, remains an open question. His group will use Hi-C and ChIP-seq to assess changes in CTCF-mediated chromatin loops of the host genome before and after expression of LMP1 (or other EBV proteins), and will couple Hi-C analysis to RNA-seq studies to correlate changes in loops to changes in gene expression. They expect that EBV infection will alter not only host chromatin but also host gene expression. This adds a new pathway to the existing model of how epigenetics and 3D chromatin structure regulate host-viral interaction and revises our understanding of the impact of viruses on the functioning of the host genome. These studies complement other ongoing research on viral-induced cancers.

Interactions with other trainers: Dr. Tempera is one of our junior trainers who just got promoted to Associate professor when recruited last year to the program. He is actively engaged with other trainers and trainees and attends all related activities. He actively engages with Drs. Robertson, Yuan, Lieberman, Greenberg, Weitzman and Yang investigating the 3D genomic changes to host genome on infection by oncogenic viruses.