

MCB Student Seminar

Prof. Shalev Itzkovitz's lab

Tuesday, December 21st, 2021 at 11:00

The seminar will start with an introduction by the PI, followed by a student talk and will end with meet, greet & eat



Amichay Afriat

Will lecture about:

A spatiotemporally resolved single cell atlas of the *Plasmodium* liver stage

Malaria infection involves an obligatory, yet clinically silent liver stage. Hepatocytes operate in repeating units termed lobules, exhibiting heterogeneous gene expression patterns along the lobule axis, but the effects of hepatocyte zonation on parasite development have not been molecularly explored. In our work, we combine single-cell RNA sequencing and single-molecule transcript imaging to characterize the host's and parasite's temporal expression programs in a zonally-controlled manner for the rodent malaria parasite *Plasmodium berghei* ANKA. We identify differences in parasite gene expression in distinct zones, and a sub-population of periportal-biased hepatocytes that harbor abortive infections associated with parasitophorous vacuole breakdown. These 'abortive hepatocytes' up-regulate immune recruitment and key signaling programs. They exhibit reduced levels of *Plasmodium* transcripts, perturbed parasite mRNA localization, and may give rise to progressively lower abundance of periportal infections. Our study provides a resource for understanding the liver stage of *Plasmodium* infection at high spatial resolution and highlights heterogeneous behavior of both the parasite and the host hepatocyte.

Wolfson Lecture Hall

Meet, greet & eat will follow the lectures