

COMBATTING FUTURE BIOLOGICAL THREATS – HOST-DIRECTED INTERVENTIONS TO EMERGING THREATS FOR RAPID RESPONSE

Rapid Detection Of Viral Infection With Host Epitranscriptional Signatures

Taehyung Kwon Los Alamos National Laboratory Sofiya Micheva-Viteva Los Alamos National Laboratory

Studying the genetic landscape within host cells during viral infection is crucial in epidemiology, while it is challenging to fully understand the dynamic interplay between two organisms. Here, we aimed to overcome this challenge by investigating transcriptional and epitranscriptional dynamics of host transcripts when infected with different DNA and RNA viruses. We characterized N6-methyladenosine (m6A) modifications in cellular transcripts, pivotal regulators of transcript lifespan, throughout different phases of viral infection. Our survey revealed the host transcripts undergo epitranscriptional changes followed by subsequent transcriptional changes involved in host immune responses and viral replication. By leveraging epitranscriptomic sequencing, these findings offer a detailed insight into the host-virus interaction on a temporal axis, which highlights the importance of detecting early epitranscriptional changes in cellular transcripts as signatures of viral infection.