

HIV-1/AIDS, since the onset of the pandemic in 1981, remains a significant public health threat, resulting in 36.3 million deaths and over 38 million people living with HIV. Despite tremendous efforts to combat the virus, there is still no cure. While no vaccine exists, potent antiretroviral therapy (ART) can control viral infection. However, ART does not cure the infection; instead, the virus enters a dormant (latent) state, evading drugs and immune recognition. Interruption of treatment leads to viral reactivation and subsequent attacks on the human body. To achieve a cure, latency must be defeated.

Latency is a complex molecular phenomenon controlled by transcriptional and less-characterized post-transcriptional repression mechanisms. Epitranscriptomics investigates post-transcriptional modifications on RNA molecules, influencing their fate. The role of epitranscriptomics in HIV replication is poorly understood, particularly its involvement in latency and reactivation. Consequently, epitranscriptomic modification of viral RNA represents an emerging layer in the control of HIV gene expression, offering new avenues for regulation and strategies to interfere with HIV expression.

In this project, we aim to elucidate the role of different epitranscriptomic modifications on HIV-1 RNA and their modulation of latent virus, using microscopy and molecular biology techniques. Results from this project may be beneficial for the identification of future new therapies to eradicate the virus and hopefully to reach a cure.