MBD Talk 3 Writeup

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March 31, 2015

This talk was about the global pandemic of HIV, which currently infects around 35 million people. The bible belt is a current hot spot in the US.

HIV is a retrovirus, named because it reverses the central dogma and replicates via reverse transcription, creating a single stranded DNA from some RNA. This is done by co-opting the cells of the host organism. The DNA of these cells are modified to become factories to create more HIV, which means infection is for life.

HIV replication is impacted by dozens of miRNA, with many related to transcription [2]. Another interesting fact that was brought u was that HIV exploits the exosome pathway [3]. If anything is blocked in this pathway, then HIV can't replicate.

HIV has a fairly small genome but has a very complex behavior. Its complexity is due in part to it's ability to acquire the proteins it needs from the host [1].

The presenter presented a hypothesis that HIV is a "Trojan Exosome." This hypothesis explains why HIV exploits the exosome pathways and why HIV acts like an exosome. It also gives explanation as to why HIV samples are contaminated with exosomes. This hypothesis predicts HIV vaccines actually help the virus, as the virus can identify and kill the T-Cells hunting for it.

References

[1] MARGARET M LEE GUO and JAMES EK HILDRETH. Hiv acquires functional adhesion receptors from host cells. *AIDS research and human retroviruses*, 11(9):1007–1013, 1995.

[2] Zachary Klase, Laurent Houzet, and Kuan-Teh Jeang. Micrornas and hiv-1: complex interactions. *Journal of Biological Chemistry*, 287(49):40884–40890, 2012.

[3] Deborah Greene Nguyen, Amy Booth, Stephen J Gould, and James EK Hildreth. Evidence that hiv budding in primary macrophages occurs through the exosome release pathway. *Journal of Biological Chemistry*, 278(52):52347–52354, 2003.