VISUALIZE HIV-1 GENOME EXPORT FROM THE CELL NUCLEUS IN LIVING CELLS.

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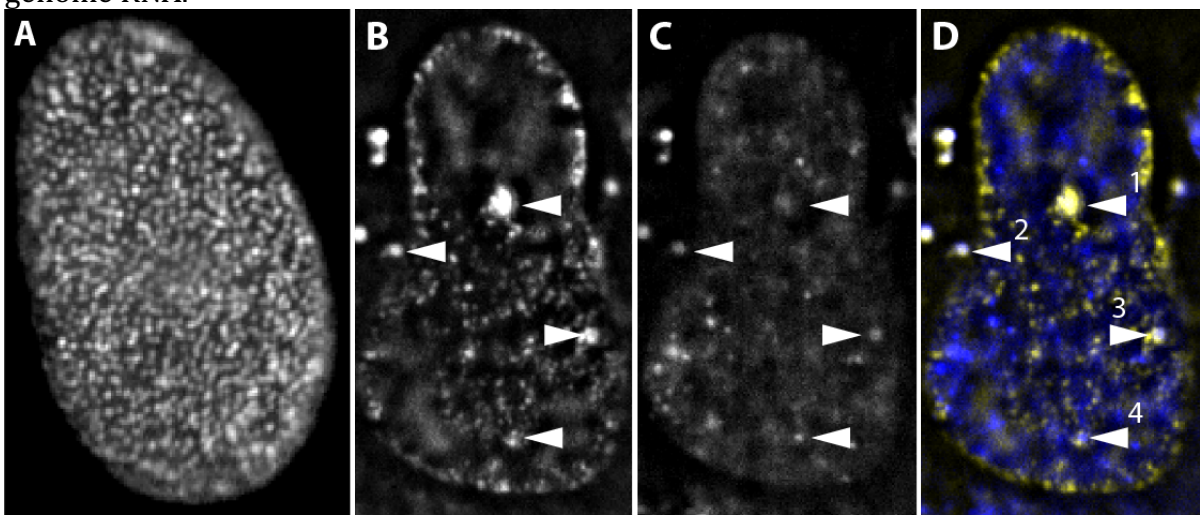
The nuclear pore (NPC) and its components (nucleoporins) have long been implicated as host factors involved in HIV-1 infection. Nucleoporins facilitate the entry of the preintegration complex (PIC) into the nucleus but when and where these nucleoporins are recruited to facilitate translocation is still unclear.
We recently found that the RNAs do not export in a canonical manner through an NPC. Rather, frequently docking and interacting with the NPCs, but almost never translocating across them, the HIV-1 RNA 'absorbs' nucleoporin (Nup) components resulting in HIV-1 RNA foci that colocalize with the Nups, and lower Nup density per NPC. The NPCs, concomitantly to or as a result of the loss of Nups cluster along the nuclear envelope (NE) leaving prominent gaps between pores. Within these gaps, bulges and herniations appear which constitute the points of en masse HIV-1 RNA exodus into the cytoplasm. The hijacked Nups colocalize with the viral genomes into the cytoplasm, continue with them to the cell membrane and are copackaged with the genomes into the newly forming viral particles that release into the intracellular space.
This finding has been verified with different cell lines, different HIV-1 model genomes and we show that the process is reliant, at least, on fully functional Rev and HIV-1 genome RNA.



Live cell imaging of HIV-1 and POM121. A) Normal NPV distribution. B) NPC distribution 48 h post induction of HIV-1 expression. C) HIV-1 genome distribution 48 h post induction of HIV-1 expression. D) Overlay of B & C.