Reviewer 1:

Reviewer's comment: The manuscript presents a study comparing the maturation rate and infectivity of HIV-1 virions in HEK293T and Jurkat cells. While the results are intriguing to certain readers, the perspective of the manuscript seems somewhat superficial and incomplete in explaining the underlying reasons for the observed differences between the two cell lines. As a result, the manuscript primarily highlights the phenomenon without delving into the underlying mechanisms. To improve the depth and comprehensiveness of the study, I recommend that the authors include additional experiments to enrich their analysis and provide insight into the mechanisms behind the observed differences.

Authors' Response: Thank you so much for reviewing our manuscript. We understand the importance, as suggested by the reviewer, of including more molecular mechanisms to explain why the virion maturation rate from the T-cell line is lower than that from HEK293 T-cells, which corresponds to the subsequent virus infectivity. As we discussed in the Discussion section, there are several factors contributing to this difference. One particular hypothesis is the expression differences of IP6, which has been reported to be important for virion maturation. Detecting IP6 is very challenging because it is a metabolite, making it unavailable for detection by western blot assay. However, we initiated a mass spectrometry analysis in collaboration with Dr. Monika Konaklieva, an associate professor in the Department of Chemistry at AU. We have identified the peak of IP6, confirming that we can measure its amount. We are currently developing a method for high-purity virus sample preparation for subsequent mass spectrometry analysis. This experiment will confirm our hypothesis about the role of IP6 in the observed phenomenon, though it is not the ultimate determinant. This manuscript is submitted in the communication format, which is intended for short articles presenting groundbreaking preliminary results or significant findings that are part of a larger, multi-year study. We believe that the observation of phenotypic differences in virus-producer cells meets the requirements of this format policy. We will conduct a deeper molecular biological analysis in the next phase of our research, which will be submitted as original research articles in the future. The requirement for further experiments and its difficulty have been emphasized in lines 133-135 in the discussion section highlighted in red.