

I, Harshit Jain, am nominating this innovative HIV research project for its potential to significantly advance the understanding of HIV's early infection mechanisms and to develop novel therapeutic strategies. The project, which focuses on utilizing artificial membranes embedded with HIV-specific receptors (CD4 and co-receptors) to capture unintegrated viral RNA, is a groundbreaking approach in the field of virology.

The high mutation rate of HIV has long been a major obstacle in creating a permanent cure. Existing methods for isolating viral RNA often result in contamination, sample degradation, and failure to accurately capture the unmutated viral genome in its natural state. Traditional techniques, such as spin column-based extraction, magnetic bead isolation, and TRIzol reagent extraction, lack the specificity and sensitivity needed to preserve the unintegrated viral RNA, making it difficult to study the virus before it mutates or integrates into the host cell's DNA.

This project introduces a novel solution by leveraging artificial membranes that mimic the natural environment of human cells, but without the presence of a nucleus where viral integration occurs. By binding the virus to these membranes, the viral genome is captured at the earliest stages of infection, allowing researchers to study the virus in its unmutated form. This method offers several advantages, including improved specificity, higher yield of viral RNA, and reduced degradation, which are crucial for advancing research on HIV drug resistance, vaccine development, and potential cure strategies.

Furthermore, this project tackles the limitations of existing technologies by offering a method that is scalable, cost-effective, and more efficient, making it accessible to researchers worldwide. It holds promise for providing new insights into the unmutated viral genome, potentially identifying conserved regions of HIV that are less susceptible to mutations, thereby opening doors to the development of more effective antiviral treatments.

For these reasons, I firmly believe that this research project deserves recognition and support. It presents a unique opportunity to make a meaningful contribution to the global fight against HIV/AIDS, and I am honored to nominate it for this distinction.

Sincerely,

Harshit Jain

Signature: Harshit Jain.



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