

Stephanie Morriss, Biochemistry

University: University of Missouri

Year in School: Senior

Hometown: Harrisonville, Missouri

Faculty Mentor: Dr. Marc Johnson, Molecular Microbiology & Immunology

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Host proteins used in HIV assembly and budding

Stephanie Morriss, Rebecca L. Jorgenson, and Marc C. Johnson

Human immunodeficiency virus (HIV), the virus responsible for the AIDS pandemic, uses host cell machinery to assist its replication during the viral life cycle. A recent study randomly screened 21,000 host cell genes using siRNA to knock down the gene's expression and determine the effect gene disruption on HIV replication. This study indicated that many host genes are involved in viral replication. We are interested in pursuing the individual genes that were reported to be required for HIV assembly and budding, the process of how the virus forms and gets out of the cell. We are selecting genes indicated to be involved in assembly and budding by this study. We will use siRNA, short double strands of RNA used in interfering with gene expression, to knock down the host gene's expression to see whether the gene has any effect on infectivity. We are attempting to verify the effect on infectivity that these host genes have and, if we confirmed the previous results, we will attempt to look at which part of viral assembly and budding is affected. We can use a variety of techniques to determine this. Single round infectivity assays allow us to see if the virus is still infectious using flow cytometry. Scanning Electron Microscopy allows us to see if the virus is budding correctly. SDS page gels allows us to stain for viral proteins which can show us if viral proteins are being made and processed correctly to form functional viral particles. Once we have established which host proteins are required for replication, we hope to determine at which step in the viral cycle the host gene comes into play and how the virus uses the host's mechanisms to spread to other uninfected cells.