



# INSTITUTE FOR CELLULAR ENGINEERING

## Towards understanding nonenveloped viral entry and release

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Viruses enter cells and deliver their genetic information to take over the cell, reproduce, and eventually release viral offspring. We study viruses for two main reasons. First, studying viruses provides valuable insight which may be used to stop them and inhibit infection. Second, viruses have evolved to get into specific cells so scientists can use them as Trojan horses. Essentially, pharmacological or gene therapy agents will be encapsulated within viral coat proteins to exploit the viral delivery mechanism. However, the delivery and release processes are specific to the type of virus and, more broadly, whether or not they contain a membrane called an envelope. How viruses which lack a membrane, or nonenveloped viruses, infect cells is poorly understood. We study Simian Virus 40 (SV40) in order to better understand how nonenveloped viruses carry out their life cycle.

We have proposed that the viral proteins VP2, VP3 and VP4 are critical for viral infection and release, moreover, that they interact with membranes to assist in genome delivery and virus release. So far, our results indicate that the viral proteins do interact with membranes. Specifically, they insert into membranes. Further work will determine how these proteins insert into membranes and what ramifications they have for viral infection and release.



Overall structure of SV40 depicting the viral coat protein VP1.  
Liddington et al., 1991  
*Nature*

Kristina Moody graduated with a Bachelors of Science in Biochemistry with a concentration in Molecular Biology from California Polytechnic State University (Cal Poly) in 2006. As an undergraduate she studied a malaria kinase believed to regulate the cell cycle called PfPK6. During summer internships at Applied Biosystems she worked on developing quantitative techniques to study DNA methylation, which is involved in gene expression. Her current research is focused on understanding viral infection and release using a combination of Biochemistry, Molecular Biology, and Cell Biology.