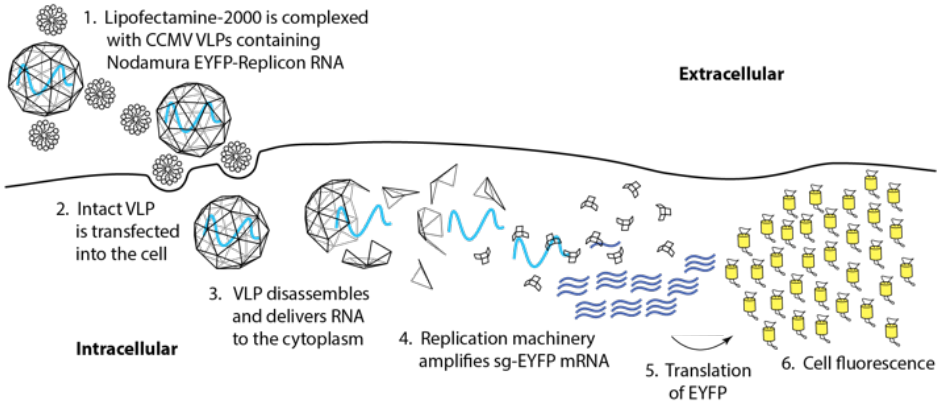
Physical Chemistry Student Seminar

“Assembling a Virus in the Lab”

The architecture of many viruses is beautifully simple. For small plant viruses, the virion often consists of only two structural elements: the RNA carrying the genetic information, and the capsid protein (CP), many copies of which form an icosahedrally-symmetric protective shell (the capsid) around the genetic cargo. Remarkably, many of these viruses are capable of spontaneous self-assembly, a process that is made possible by a delicate balance of attractive and repulsive forces that has evolved between the structural units. We study the self-assembly of one such virus, Cowpea Chlorotic Mottle Virus (CCMV). We have systematically investigated how the assembly process is affected by: (1) the relative strength of the interactions between the structural units, (2) the relative stoichiometry of the structural units, and (3) the relative size of the structural units. Using experimental techniques that include native gel electrophoresis, velocity sedimentation, and electron microscopy, we have identified some key requirements for the optimal assembly of CCMV. Additionally, we have begun exploring the possibility of using self-assembled CCMV capsids as vectors for gene delivery. These topics will be discussed.



Presented by

Rees F. Garmann

Prof. William Gelbart’s & Prof. Charles Knobler’s group

Department of Chemistry & Biochemistry

University of California, Los Angeles

Wednesday, May 28, 2014

12:00 P.M.

2033 Young Hall