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Membrane-mediated interaction between retroviral capsids RUI ZHANG, Northeastern State University, TOAN NGUYEN, Georgia Institute of Technology — A retrovirus is an RNA virus that is replicated through a unique strategy of reverse transcription. Unlike regular enveloped viruses which are assembled inside the host cells, the assembly of retroviral capsids happens right on the cell membrane. During the assembly process, the partially formed capsids deform the membrane, giving rise to an elastic energy. When two such partial capsids approach each other, this elastic energy changes. Or in other words, the two partial capsids interact with each other via the membrane. This membrane mediated interaction between partial capsids plays an important role in the kinetics of the assembly process. In this work, this membrane mediated interaction is calculated both analytically and numerically. It is worth noting that the diferential equation determining the membrane shape in general nonlinear and cannot be solved analytically,except in the linear region of small deformations. And it is exactly the nonlinear regime that is important for the assembly kinetics of retroviruses as it provides a large energy barrier. The theory developed here is applicable to more generic cases of membrane mediated interactions between two membrane-embedded proteins.

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