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Viral Capsid Assembly in a crowded environment ERCAN KAMBER, Brandeis University, MICHEAL F. HAGAN, University of California, Berkeley, JANE' KONDEV, Brandeis University — While many experimental and all theoretical studies of viral capsid assembly dynamics focus on assembly in dilute solution, viruses replicate in the cell, which presents a crowded environment composed of numerous confining sub-volumes. We examine the effects of crowding and confinement on the formation of T1 capsidlike objects by using Newtonian dynamics simulations[1]. Subunits have excluded volume and asymmetric pairwise bonding interactions between complementary sides [1] and are confined to a three-dimensional box. We address the effects of finite system size on assembly dynamics by varying the system size with a fixed volume fraction of capsid subunits, and by varying the system size with a fixed number of subunits. In both cases, we find a non-monotonic variation in capsid formation times as the system dimensions become comparable with the size of a capsid. By analyzing assembly mechanisms, we probe the nature of assembly in crowded and confined environments. This work is supported by NSF DMR-0403997.

[1] M. Hagan and D. Chandler, Biophys. J. v 91, 2006

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