



# The Physics of Soft and Biological Matter

## P.44 Self-assembly of nanoparticles on fluid membranes

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We show how fluid membranes can mediate linear aggregation of spherical nanoparticles binding to them for a wide range of biologically relevant membrane rigidities. This result is in net contrast with the isotropic aggregation of nanoparticles on fluid interfaces or the expected clustering of isotropic insertions in biological membranes. We find that the key to understanding the stability of linear aggregates resides in the interplay between bending and binding energies of the nanoparticles. Furthermore, we demonstrate how linear aggregation can lead to membrane tabulation and determine how tube formation compares with the competing budding process. The development of tubular structures requires less adhesion energy than budding, pointing to a potentially unexplored route of viral infection and nanoparticle internalization in cells.