# On the growth of helical pipe protrusions out of lipid bilayers interacting with ESCRT-III subunits

Luca Barberi[1] and Martin Lenz[1]

[1]*LPTMS, CNRS, Univ. Paris-Sud, Université Paris-Saclay, 91405 Orsay, France*

ESCRT-III is a cytosolic protein complex necessary for membrane remodeling in a number of cellular processes, ranging from cytokinesis [1] to multivescicular body biogenesis [2] and viral budding [3]. Despite its importance, we still have a limited knowledge on the specific contribution of each of its subunits in deforming lipid bilayers. One of these, Snf7, has been observed to polymerize on membrane substrates in the shape of spirals [4], whose out-of-plane buckling could, theoretically, drive an invagination dynamics [5]. Recent unpublished observations by our collaborators from the Roux Lab in Geneva have shown how the addition of two further ESCRT-III subunits, namely Vps2 and Vps24, can make helical pipe membrane protrusions bud away from the cytoplasm. As they bind to a Snf7 spiral, Vps2 and Vps24 could directly influence its preferred curvature and torsion, making it grow out of the plane of the membrane to which it sticks and leading to the formation of the observed helical protrusions. In order to validate this prediction, we developed a model of polymerized membrane and present some preliminary results on the mechanically stable configurations of such system.

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