

Hsp70 mediated protein stabilization & collective cell motion in lung organoids

Sander Trans (AMOLF Institute)

Abstract:

In this talk I will cover two quite different topics. In the first (Nature 2016), we revisited the model of action for the chaperone Hsp70, which is involved in a host of cellular processes ranging from de-novo folding to the regulation of apoptosis. This long-standing model suggests that Hsp70 binds exposed peptide segments, thus stabilizing unfolded states. Using single-molecule manipulation with optical tweezers, we show that Hsp70 also does the opposite, and stabilize folded states. The Hsp70 helical lid is essential for this function, suggesting a clamp-like mechanism. This mode of action could play a role in the various physiological functions of Hsp70. The second topic concerns cellular motility within organoids - assemblies of in-vitro grown cells that reproduce key organ structure and function. Specifically, I will talk about lung organoids and infection with RSV virus. Surprisingly, upon infection, the organoids undergo a dramatic rotational movement. Analysis suggests that this coordinated movement emerges from purely mechanical interactions between randomly moving cells.