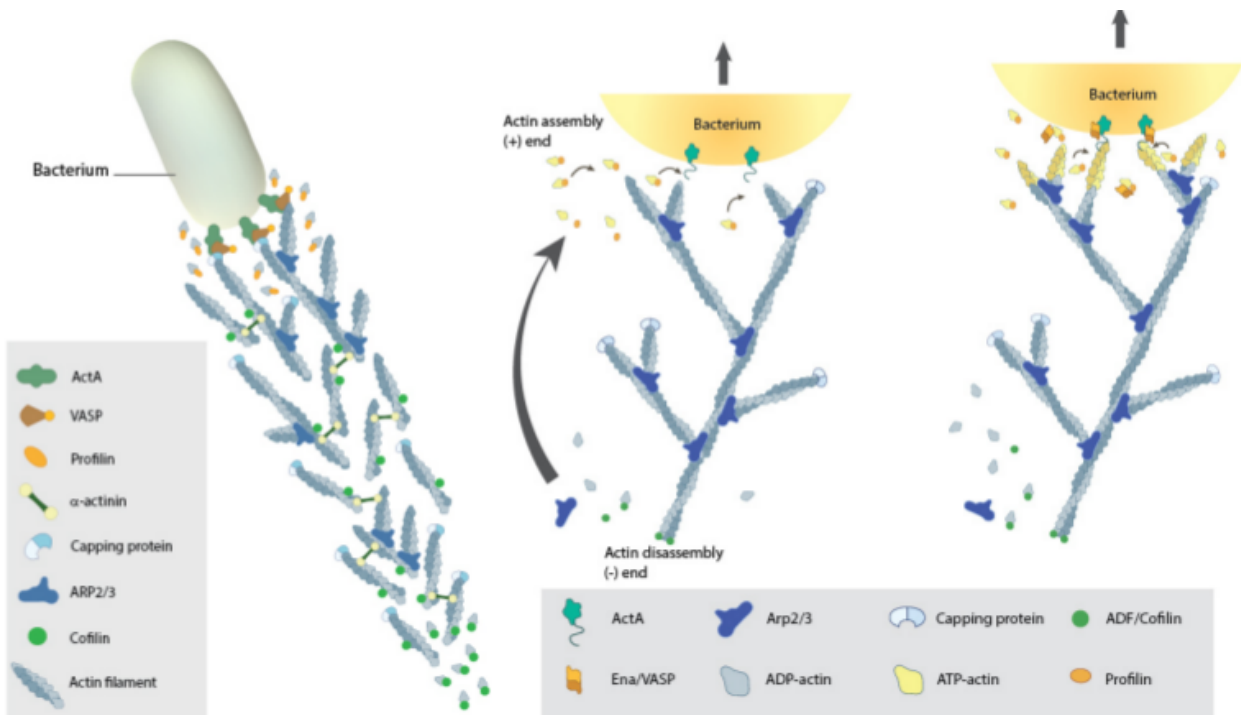


Force generation through polymerization

In contrast to macroscopic objects, the cytoskeleton is never static by constantly turns over. I encourage you to watch the excellent [video by Julie Theriot](https://www.youtube.com/watch?v=FIT0fdt6c3Y) (<https://www.youtube.com/watch?v=FIT0fdt6c3Y>) on this topic (youtu.be/FIT0fdt6c3Y).

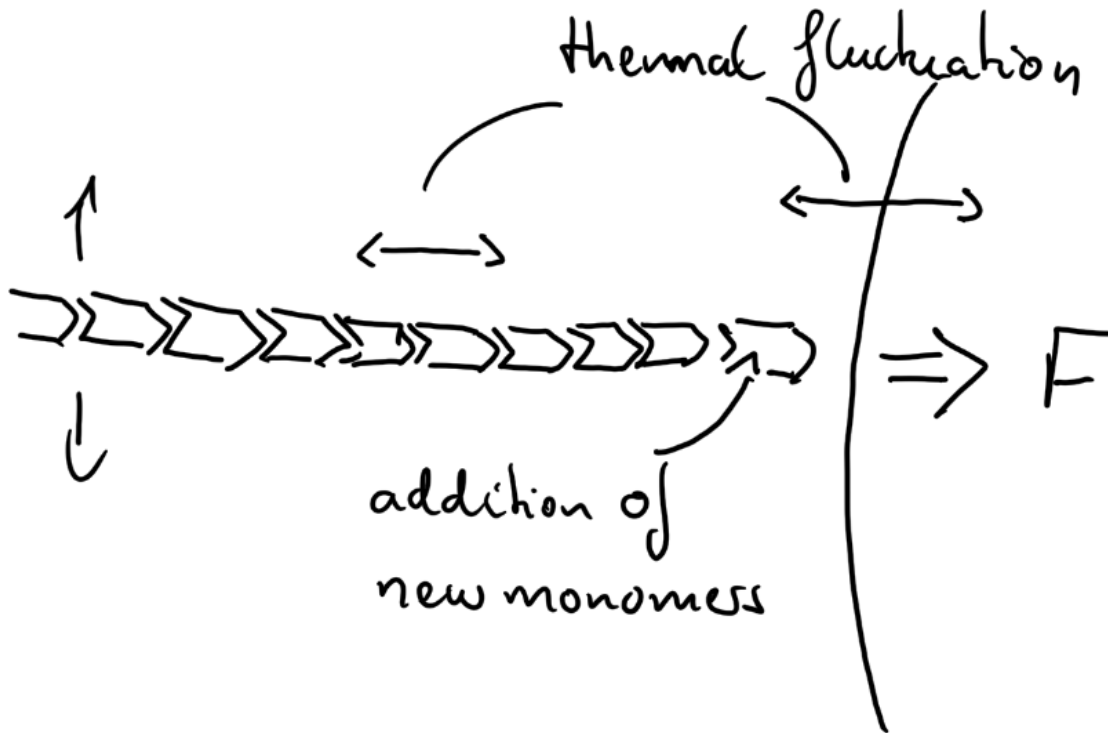
She explains how polymerization of action is the basis of cell motility and has led to fascinating biology such as the "comet-tails" of listeria.

Filling the void



by [mechanobio.info](https://www.mechanobio.info/pathogenesis/what-are-actin-comet-tails/) (<https://www.mechanobio.info/pathogenesis/what-are-actin-comet-tails/>).

Thermal fluctuations to force



- thermal fluctuations open the space between the membrane and the filament
- a new monomer is added (which consumes ATP)

Note that such force generation is **only** possible because the reaction is irreversible and consumes ATP. An equilibrium reaction could not generate a force.