

Abstract Submitted
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Cooperative Macromolecular Disassembly via the Heat Shock Chaperone Hsc70¹ JASON PUCHALLA, KELLY KRANTZ, ROBERT AUSTIN, HAYS RYE, Princeton University — Many essential cellular functions depend on the assembly and disassembly of macromolecular complexes. A general class of protein known as molecular chaperones regulates several of these processes. How can complex protein structure be quickly and efficiently disassembled by the action of a small number of these proteins? One such example is that of clathrin: a ubiquitous coat protein that stabilizes vesicular trafficking by forming a scaffold onto the membrane surface. This scaffold must be removed before the vesicle can deliver its cargo. We report on the cooperative disassembly of yeast-derived GFP-labeled clathrin baskets via its interaction with Hsc70. We exploit the highest signal-to-noise light bursts from single fluorescent baskets transiting a confocal excitation spot to recursively determine the brightness and size distribution of the baskets during the uncoating process. This minimal uncoating system demonstrates the ability of a surprisingly simple protein system to facilitate rapid structural changes through cooperative action.

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