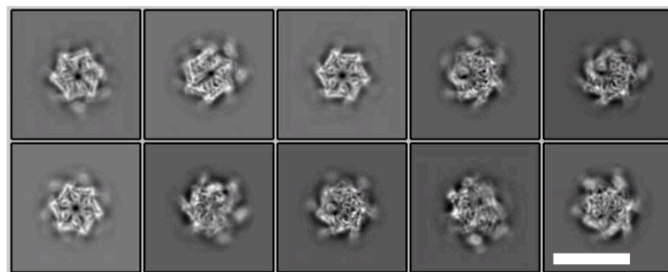
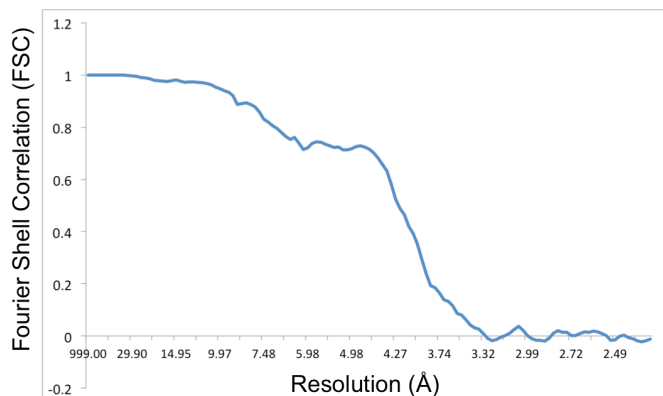


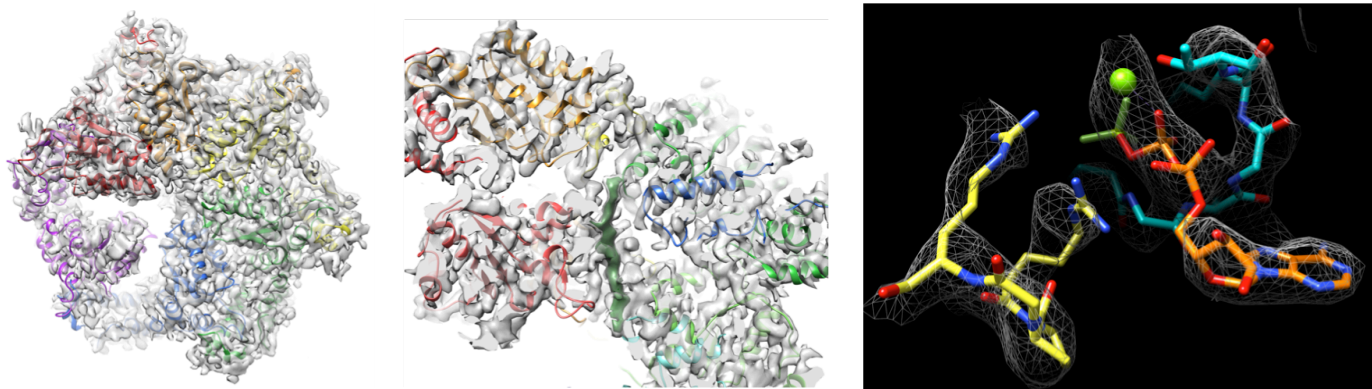
**Figure 1.** Cryo-EM micrograph of purified substrate-bound Cdc48 complexes. Image recorded on Talos Arctica/K2.



**Figure 2.** Reference-free 2D classes of the substrate-bound Cdc48 particle. Scale bar, 20 nm.



**Figure 3.** Reference-free 2D classes of the substrate-bound Cdc48 particle.



**Figure 4.** Reconstruction of asymmetric, substrate-bound Cdc48 complex derived from ~50k particles. Left, top view of complex. Note that the pink subunit is pulled away from the central pore and disengaged from substrate. Middle, cut-away side view showing substrate density (green). Right, density and model of nucleotide (ATP).