

# Towards direct visualization of the reaction coordinates of proteins

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As for man-made machines, the functional cycles of enzymes and other proteins involve the coordinated motion of their parts. These motions, and the mechanical properties of proteins more generally, are therefore an important link between protein structure, function, and evolution. For most proteins, experimental access to protein mechanics has remained elusive.

I will describe our efforts to observe the concerted motions of proteins in atomic detail by room-temperature and time-resolved X-ray crystallography. I will discuss new results on the direct visualization of K<sup>+</sup> ion permeation through an ion channel, and the dissection of intermediates in the reduction of substrate by the enzyme dihydrofolate reductase.