

Enzyme Motors and Pumps: From Transport to Collective Behavior

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One of the more interesting recent discoveries has been the ability of free-swimming enzymes to catalytically harness the chemical energy in their environment to move autonomously. Recent work from our group has shown that enzymes participating in catalytic cascades show surprising emergent behavior, ranging from directional chemotactic motility in response to chemical gradients to dynamic assembly driven by phoretic and hydrodynamic effects. The resultant organization and collective behavior of interacting active enzymes show remarkable similarities to the biological world.