

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Biochemistry on a leash: A mechanism for ligand recruitment via tethered binding sites** DANIEL REEVES, KEITH CHEVERALLS, JANE KONDEV, Brandeis University — The diffusion limited reaction rate for ligand-receptor systems is typically estimated as the rate at which the ligand stumbles upon the receptor site by three-dimensional Brownian motion. We consider a mechanism that improves upon this limiting rate by placing a binding site on a flexible polymer. The tethered binding site explores the vicinity of the receptor site via polymer diffusion. After binding the ligand, the tether directly transfers it to the receptor site. This is in contrast with existing model mechanisms that involve non-specific binding that confines the ligand to lower-dimensional diffusion. The proposed mechanism may be relevant to the biological actin capping protein formin, which increases actin polymerization rates when bound to the growing tip of actin filaments.

Daniel Reeves  
Brandeis University

Date submitted: 27 Nov 2007

Electronic form version 1.4