

Abstract Submitted
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Time-temperature-transformation curves in chemical reactions regulated by cytoskeletal activity BHASWATI BHATTACHARYA, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India, ABHISHEK CHAUDHURI, University of Oxford, UK, KRIPA GOWRISHANKAR, University of California, Davies, SATYAJIT MAYOR, National Centre for Biological Sciences-TIFR, Bangalore, India, MADAN RAO, Raman Research Institute/National Centre for Biological Sciences-TIFR, Bangalore, India — Efficient and reproducible construction of signaling and sorting complexes, both on the surface and within the living cell, is contingent on local regulation of biochemical reactions by the cellular milieu with active components. We have recently proposed that in many cases this spatiotemporal regulation can be mediated by interaction with components of the dynamic cytoskeleton, where the interplay between active contractility and remodeling of the cytoskeleton results in transient focusing of passive molecules to form clusters, leading to a dramatic increase in the reaction efficiency and output levels. In this presentation, we discuss the implications of actin dynamics by introducing an “effective temperature,” which can work as a regulatory parameter for signaling replacing the details of actin dynamics. We show this in time-temperature-transformation plots, with the proposed “effective temperature” as a parameter, which paves way for discussion of active chemical thermodynamics.

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