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Abstract for an Invited Paper
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Energy Landscapes Encoding Function in Enzymes Investigated Over Broad Time Scales[1]

ROBERT CALLENDER, Albert Einstein College of Medicine

The operating hypothesis of much of our current work is that atomic motion, over broad time scales (femtoseconds to milliseconds, the latter being the time scale of most enzyme catalyzed reactions), contributes to enzymic catalysis in proteins. It is clear from our work that specific types of motions are important in binding of ligands to proteins and transition state formation in enzymatic catalysis. Since new experimental and theoretical approaches are needed to understand the dynamical nature of proteins broadly and enzymatic catalysis specifically, we have employed time-resolved "pump-probe" spectroscopic techniques because of the sensitivity of these type of approaches to all relevant time scales. And we have also developed and applied new theoretical methods. The talk will focus on how lactate dehydrogenase brings about catalysis based on current experimental and theoretical studies.

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