

**TABLE 5.1** Timescales of motions in proteins. The data are taken from [8–10].

Type of Movement	Example	Timescale (sec)
Local motions	• Overall	$10^{-15} - 10^{-6}$
	• Bond vibration	$10^{-15} - 10^{-13}$
	• Elastic vibration of globular region	$10^{-12} - 10^{-11}$
	• Methyl group rotation around connecting bond to molecule	$10^{-12} - 10^{-9}$
	• Rotation of surface side chains	$10^{-11} - 10^{-10}$
	• Hinge bending at domain interfaces	$10^{-11} - 10^{-7}$
	• Loop movement FV	$10^{-9} - 10^{-6}$
	• $\alpha$ -helix formation	$10^{-8} - 10^{-7}$
Rigid body motions	• Helix, domain, subunit	$10^{-9}$
Motions of large domains		$10^{-6} - 10^{-3}$
Protein folding		$10^{-6} - 10^{-4}$