

构象耦合作用下驱动蛋白的定向运动

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用电偶极子的转动来描述驱动蛋白的构象变化。把微管的构象简化为若干电偶极子的线性排列。驱动蛋白和微管之间的相互作用可看作偶极子-偶极子的耦合作用。计算结果表明:这种耦合作用能够产生沿微管的定向粒子流,并且粒子平均位移反映了驱动蛋白实验结果的主要特征。

THE DIRECTIONAL MOTION OF KINESIN BY CONFORMATIONAL COUPLING

The conformational change of kinesin is described by the rotation of a dipole which interacts with the microtubule. The microtubule is simplified as linear distribution of dipoles. The interaction between the kinesin and the microtubule can be taken as the coupling among the dipoles. The numerical calculation shows: this coupling produces a directional motion along the microtubule and the average displacement reflects the main feature of kinesin motors.

关键词

偶极子(Dipole); 微管(Microtubule); 驱动蛋白(Kinesin); 布朗马达(Brownian motor)