

Cover Picture

Matthias Rief and Helmut Grubmüller

The cover picture shows how the mechanical properties of single molecules can be measured. Many processes in the body are effected and regulated by highly specialized protein molecules; the specific binding of a ligand molecule (“key”) to a receptor protein (“lock”) is a basic working principle of molecular recognition processes. Recent advances in single-molecule experiments and simulations reveal a host of astounding finely tuned mechanisms. Experimentally, receptors (red) are bound with a ligand (yellow), which is subject to an increasing pulling force. The pulling force is generated by an AFM tip, here indicated by the spring, and the rupture force can be measured. These experiments are also simulated at atomic detail in recent molecular dynamics calculations. Find out more in the article by Rief and Grubmüller on pages 255 – 261.

