



Dynamic Force Spectroscopy and Biomolecular Recognition

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Molecular recognition, also known as biorecognition, is the heart of all biological interactions. Originating from protein stretching experiments, dynamic force spectroscopy (DFS) allows for the extraction of detailed information on the unbinding process of biomolecular complexes. It is becoming progressively more important in biochemical studies and is finding wider applications in areas such as biophysics and polymer science. In six chapters, **Dynamic Force Spectroscopy and Biomolecular Recognition** covers the most recent ideas and advances in the field of DFS applied to biorecognition:

- *Chapter 1:* Reviews the basic and novel aspects of biorecognition and discusses the emerging capabilities of single-molecule techniques to disclose kinetic properties and molecular mechanisms usually hidden in bulk measurements
- *Chapter 2:* Describes the basic principle of atomic force microscopy (AFM) and DFS, with particular attention to instrumental and theoretical aspects more strictly related to the study of biomolecules
- *Chapter 3:* Overviews the theoretical background in which experimental data taken in nonequilibrium measurements of biomolecular unbinding forces are extrapolated to equilibrium conditions
- *Chapter 4:* Reviews the most common and efficient strategies adopted in DFS experiments to immobilize the interacting biomolecules to the AFM tip and to the substrate
- *Chapter 5:* Presents and discusses the most representative aspects related to the analysis of DFS data and the challenges of integrating well-defined criteria to calibrate data in automatic routinary procedures
- *Chapter 6:* Overviews the most relevant DFS applications to study biorecognition processes, including the biotin/avidin pair, and selected results on various biological complexes, including antigen/antibody, proteins/DNA, and complexes involved in adhesion processes
- *Chapter 7:* Summarizes the main results obtained by DFS applied to study biorecognition processes with forthcoming theoretical and experimental advances

Although DFS is a widespread, worldwide technique, no books focused on this subject have been available until now. **Dynamic Force Spectroscopy and Biomolecular Recognition** provides the state of the art of experimental data analysis and theoretical procedures, making it a useful tool for researchers applying DFS to study biorecognition processes.

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