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- Genes and Other Genetic Materials
- Replication and Recombination
- Gene Expression
- Protein Synthesis
- DNA-Protein Interaction
- RNA Processing
- Genetic Engineering
- Genetic Diseases
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Extracellular Matrices and Cell Adhesion Molecules
Cell Cycle
Receptors and Signal Transduction
Stress Proteins and Molecular Chaperones
Cell Death
Differentiation, Development, and Aging
Neurobiology
Tumor and Immunology

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COVER:

Discovery in Japan

Direct measurement of catalytic power of conformational sub-states on F₁-ATPase

In the process of catalysis, protein molecules experience a large number of conformational sub-states by thermal fluctuation, which has been considered to be important for enhancement of the catalytic power (1). Although there is a great deal of experimental evidence for the contribution of conformational fluctuation to the catalytic enhancement, the catalytic power of individual conformational sub-states is not well understood (1, 2). Recently, the rotary motor protein; F₁-ATPase, is mechanically stalled in transient conformations, and its catalytic power in various conformational sub-states was successfully measured, which directly verified the importance of protein dynamics on enhancement of catalytic power (3).

Center: 3D structure of F₁-ATPase. Right hand: the mechanical manipulation via rotary shaft which restrains F₁-ATPase in a targeted conformational sub-state. Left hand: the observation of the catalytic reaction of F₁-ATPase.

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