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## Molecular Dynamics in the Nucleus and Gene Regulation

### 核内分子動態と機能発現メカニズム

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Our genome, whose length is about 2m, is folded into chromatin structure and is compactly packaged into a nucleus of cell whose diameter is a few  $\mu\text{m}$ . In the nucleus, DNA-binding proteins interact with genome DNA and regulate transcription, DNA duplication, DNA repair and so on. In addition, chromatin itself dynamically changes the structure and participates in such regulations. In my lecture, I will address how proteins interact with DNA to achieve such fundamental processes that are revealed by molecular simulations.

Keywords : protein, nucleic acid, complex, dynamics, simulation