72nd RAP Seminar

The 72nd Seminar on RIKEN Center for Advanced Photonics

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- ONLINE Seminar -

Date: **July 16 (Fri) 16:00 - 17:00, 2021**

Title: **Elucidating the energetics of biological molecular machines**

生体分子マシンのエナジェティクスに迫る

Speaker: **Prof. Shoichi TOYABE**

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Pre-registration

Biological molecular motors are tiny autonomous machines working in cells. Their dimension is only ten nanometers, but they work robustly and efficiently in the fluctuating and complex environment inside cells. Since these machines are nano-sized engines that convert chemical energy to mechanical work, energetics is crucial for characterizing motor performance. We have developed an experimental methodology to evaluate the energetic quantities of the molecular motors by combining statistical physics and single-molecule experiments. This methodolgy has been revealing the mechanism underlying the highly efficient mechanochemical coupling of a rotary motor, F1-ATPase. In this seminar, I discuss how the nano-sized F1-ATPase converts chemical energy to mechanical motion efficiently in a fluctuating environment. I also briefly introduce our ongoing project to create an artificial nanomotor.

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