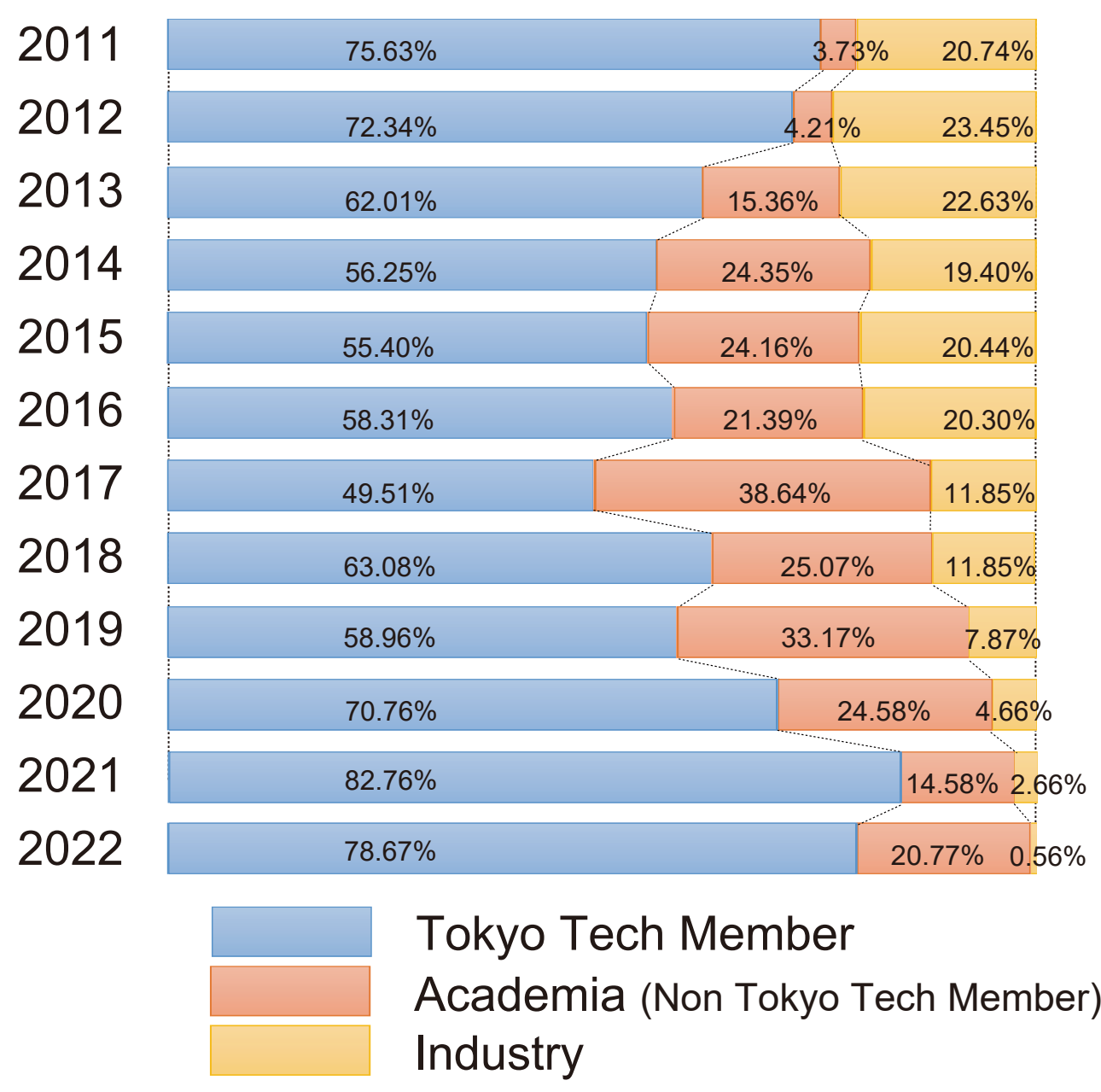# Joint Usage of TSUBAME3.0
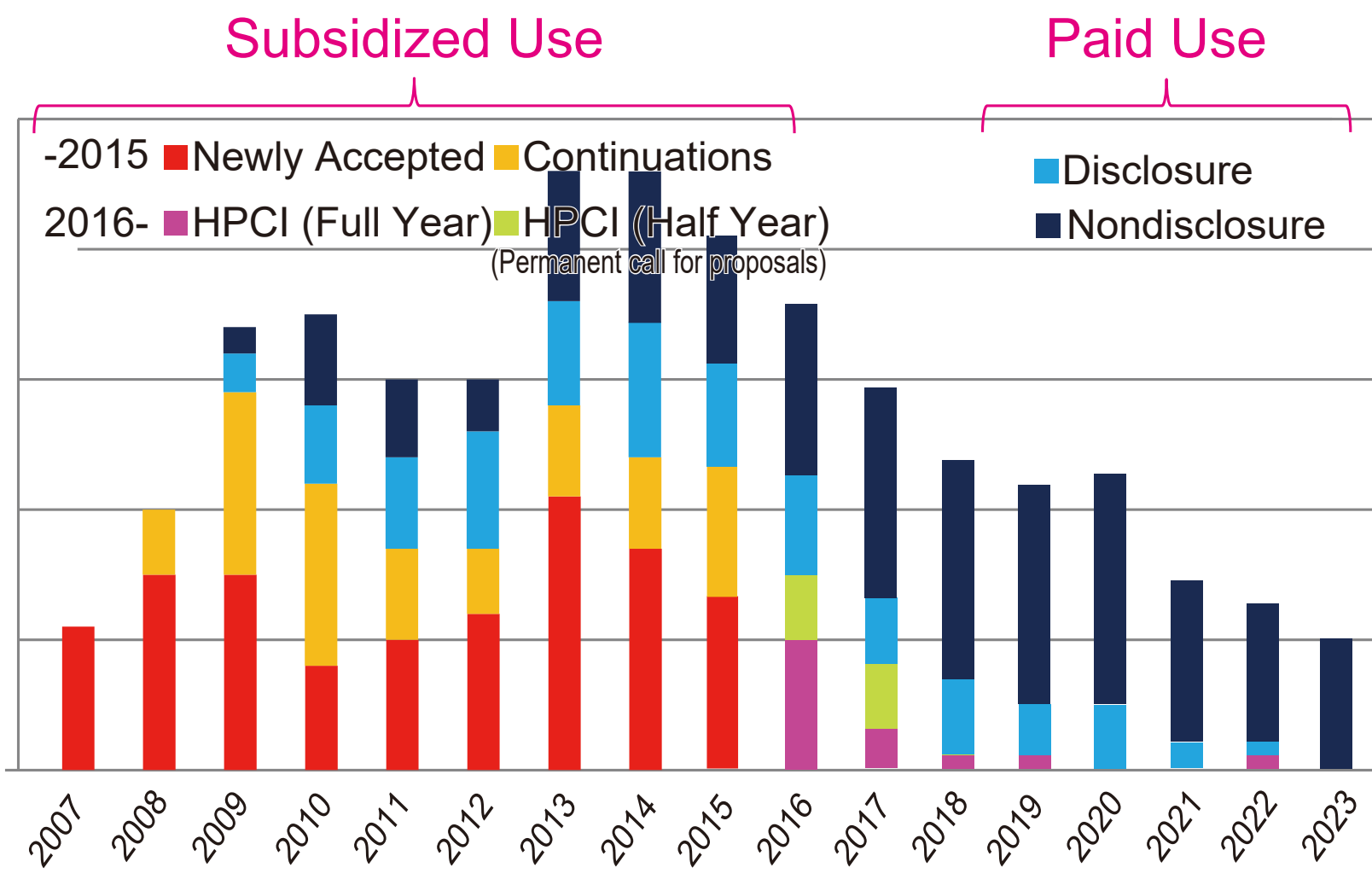## Partnership Resource Allocations

TSUBAME Industrial Use -Statistical Information-

TSUBAME is open to academia and industries. Industrial use started in FY2007.

TSUBAME Resource Usage Profile

Year	Tokyo Tech Member	Academia (Non Tokyo Tech Member)	Industry
2011	75.63%	3.73%	20.74%
2012	72.34%	4.21%	23.45%
2013	62.01%	15.36%	22.63%
2014	56.25%	24.35%	19.40%
2015	55.40%	24.16%	20.44%
2016	58.31%	21.39%	20.30%
2017	49.51%	38.64%	11.85%
2018	63.08%	25.07%	11.85%
2019	58.96%	33.17%	7.87%
2020	70.76%	24.58%	4.66%
2021	82.76%	14.58%	2.66%
2022	78.67%	20.77%	0.56%

Tokyo Tech Member
Academia (Non Tokyo Tech Member)
Industry

The Number of Industrial Projects

Subsidized Use — Paid Use

-2015 ■Newly Accepted ■Continuations
2016- ■HPCI (Full Year) ■HPCI (Half Year)
(Permanent call for proposals)
■Disclosure
■Nondisclosure

How to Use TSUBAME?

User Types	Programs	Remarks
Tokyo Tech Students and Faculty Member		All Students have TSUBAME accounts.
Non-Tokyo Tech Users (Academic and Industrial Users)	Partnership Resource Allocations	
	HPCI/JHPCN	Supported by MEXT
Industrial Users	Project for Creation of Research Platforms and Sharing of Advanced Research Infrastructure (- 2015)	Supported by MEXT
	HPCI/JHPCN (2016 -)	Supported by MEXT
Foreign Researchers	International Collaboration	
Collaborators with Tokyo Tech Professors	Research Collaboration based on Research Fund or Industrial Contracts	

TSUBAME Services

Menu	Publicity	Price	Remarks
Subsidized Use	Disclosure	Free	Supported by MEXT
Pay Use	Disclosure	$0.75/NodeH	
	Nondisclosure	$2.24/NodeH	

Exchange rate is calculated with $1 = ¥147.

Intellectual Property Rights are reserved completely by the users and are not required to be shared with Tokyo Tech. "NodeH" is the unit for pricing. 1 NodeH is equivalent to 1 node for 1 hour.

For example, if you pay $75, you can use 100 nodes for 1 hour, or 1 node for 100 hours.
Each node has 2 Intel Xeon processors (28 cores) and 4 NVIDIA Tesla P100 GPUs, with 256GB Memory.
"Publicity: Disclosure" requires company name, division, purpose to use and the report of result to be published.
"Publicity: Nondisclosure" only requires company name to be published.

## Cis-allosteric regulation of HIV-1 reverse transcriptase by Integrase

Takao Masuda (Tokyo Medical and Dental University), Osamu Kotani (National Institute of Infectious Diseases) et al.

Reverse transcriptase (RT) and integrase (IN) are encoded tandemly in the pol genes of retroviruses. This study examined the effect of IN fusion on RT during reverse transcription by an in vitro cell-free assay, using recombinant HIV-1 RTIN (rRTIN). It found that, compared to recombinant RT, rRTIN generated significantly higher cDNAs under physiological concentrations of dNTPs. Then, analysis of molecular dynamics simulations suggested that IN can influence the structural dynamics of the RT active center and the inhibitor binding pockets in cis. Thus, This study demonstrated, for the first time, the cis-allosteric regulatory roles of IN in RT structure and enzymatic activity.
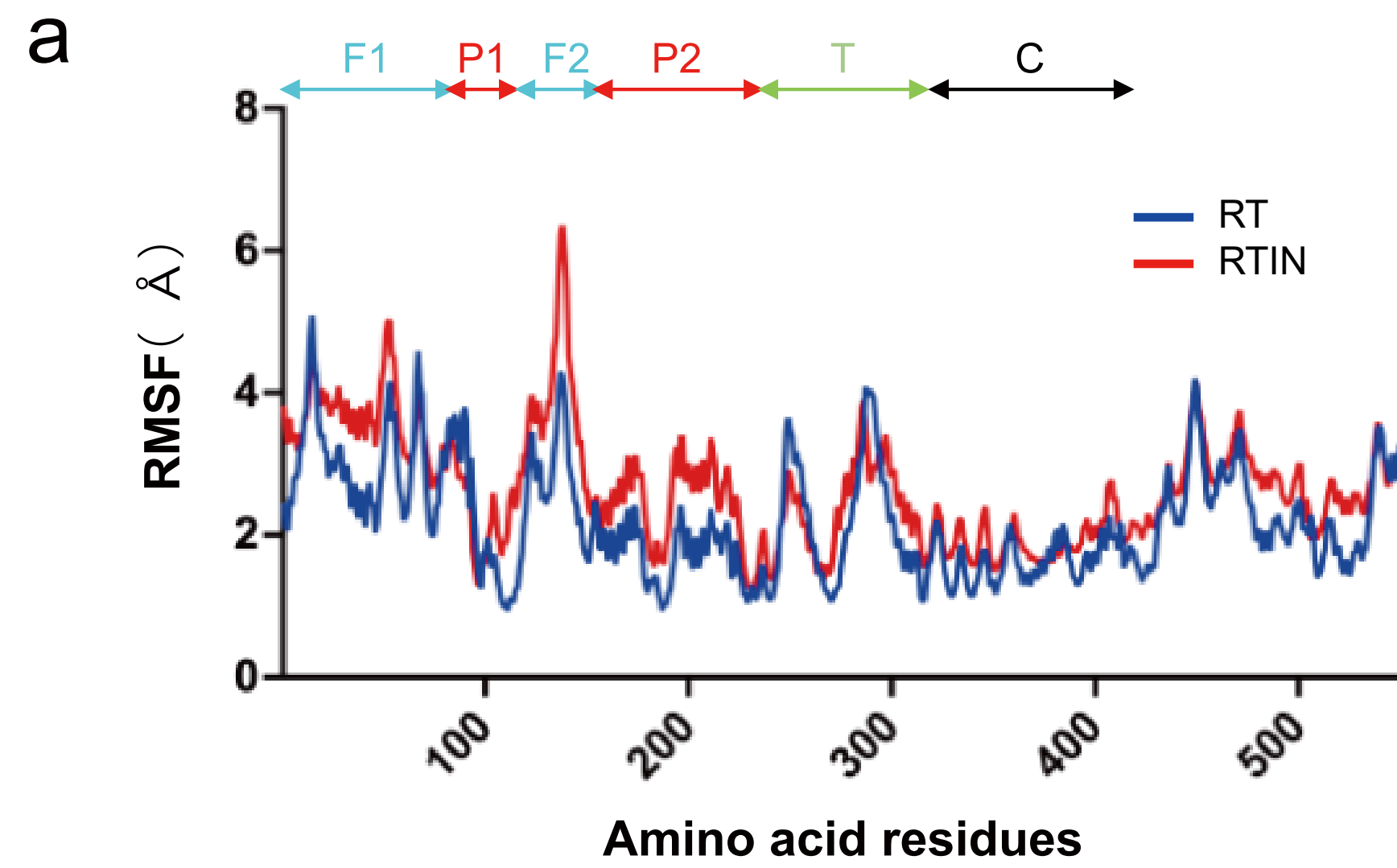
Figure: Effects of IN fusion on fluctuations of RT protein. RMSF values, which indicate the atomic fluctuations of the main chains of individual amino acids during MD simulations. **(a)** Distributions of RMSF inRT. Numbers on the horizontal axes indicate positions in the mature RT of HIV-1 NL4-3. **(b)** Overall view of RT active center.
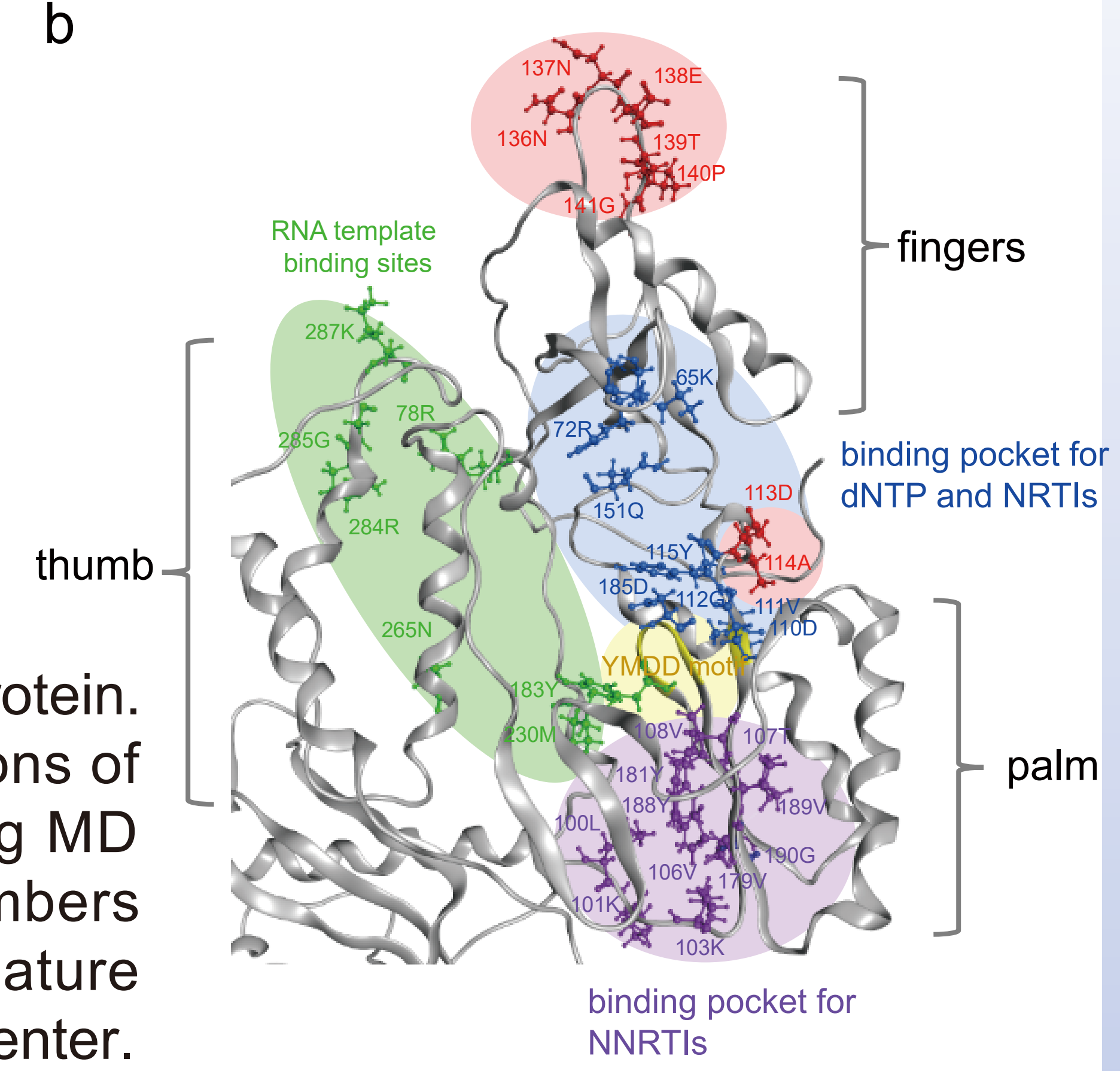
HPCI Confederation

High Performance Computing Infrastructure
- National grid infrastructure for HPC research

Resources
- 15 supercomputers in Japan, including TSUBAME3.0
- 90PB global shared storage to share data

Services
- One-stop sign up to all resources
- Single sign on to all resources using Shibboleth & GSI

Status
- 10 projects use TSUBAME3.0 for the HPCI project on FY2023

For more details, please go to booth #1725 "Research Organization for Information Science & Technology (RIST)"

JHPCN

Joint Usage/Research Center for Interdisciplinary Large-scale Information Infrastructures

The Network-Type Research Center aims to contribute to the advancement and permanent development of the academic and research infrastructure of Japan

Resources Provider

8 supercomputer centers in Japan, including TSUBAME3.0

Call for Proposals of Joint Research Projects

Approximately 60 research projects in each year, including international & Industry joint research projects

Status

7 projects use TSUBAME3.0, and total 68 projects are adopted as JHPCN projects on FY2023