ACTIVITY REPORT



In Vitro Reconstitution of the Mitochondria-Associated ER Membranes (MAM) using Xenopus egg extracts

Roles of Membrane Contact Sites in Organelle Dynamics and Diseases



Yoshitami Hashimoto, Ph. D.

Assistant Professor

Laboratory of Cellular Regulation,

Tokyo University of Pharmacy and Life Sciences.

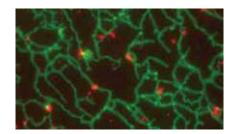
Tokyo University of Pharmacy and

Research summary

The endoplasmic reticulum (ER) is physically connected to mitochondria at a region called the mitochondria-associated membrane (MAM), which plays important roles in regulating not only mitochondrial activity but also various fundamental phenomena such as cell growth, apoptosis and autophagy. In this study, we will develop a novel in vitro system that recapitulate the MAM structure using fractionated *Xenopus* egg extracts for the purpose of analyzing the molecular architecture and biological function of the MAM.

Figure

A microscopic picture showing that mitochondria (red) are deposited along the ER tubule network (green) formed in egg extracts.



References

- 1.Ray Chaudhuri A, <u>Hashimoto Y</u>, Herrador R, Neelsen KJ, Fanchinetti D, Bermejo R, Cocito A, Costanzo V, Lopes M. (2012) Topoisomerase I poisoning results in PARP-mediated replication fork reversal. *Nat. Struct. Mol. Biol.*, 19, 417–23.
- 2. Hashimoto Y, Puddu F, Costanzo V. (2012) RAD51 and MRE11 dependent reassembly of uncoupled CMG helicase complex at collapsed replication forks. Nat. Struct. Mol. Biol., 19, 17–24.
- 3. Hashimoto Y, Ray Chaudhuri A, Lopes M, Costanzo V. (2010) Rad51 protects nascent DNA from Mre11-dependent degradation and promotes continuous DNA synthesis. *Nat. Struct. Mol. Biol.*, 17, 1305–1311.
- 4. Hashimoto Y, Tsujimura T, Sugino A, Takisawa H. (2006) The phosphorylated C-terminal domain of Xenopus Cut5 directly mediates ATR-dependent activation of Chk1. Genes Cells, 11, 993-1007.