Selectivity of mRNA degradation by autophagy discovered

～A new phenomenon has been discovered: autophagy selectively degrades mRNA bound to ribosomes, involving gene expression!!～

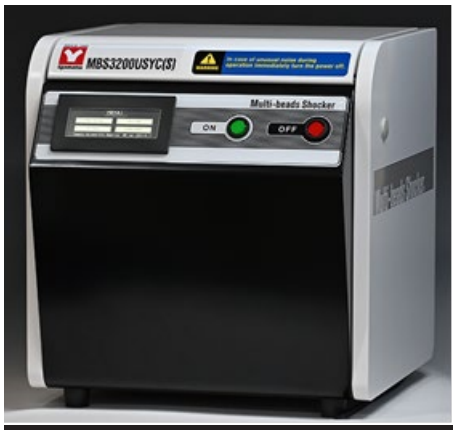
The results of research by a research group including Researcher Makino Shiho, Assistant Professor Kawamata Tomoko, Honorary Professor Ohsumi Yoshinori (Cell Biology Research Center, Institute of Innovative Research, Tokyo Institute of Technology) and Chief Researcher Iwasaki Shintaro (Iwasaki RNA Systems Biochemistry Laboratory, RIKEN Exploratory Research Center) have been published in a paper in Nature Communications!

"Selectivity of mRNA degradation by autophagy in yeast"

Shino Makino, Tomoko Kawamata, Shintaro Iwasaki & Yoshinori Ohsumi Nature communications 12, Article number: 2316 (2021)

Overview

Autophagy is a mechanism for breaking down cellular components and contributes to maintaining metabolic homeostasis. Until now, autophagy has been understood mainly as a mechanism for breaking down proteins, but it has recently become clear that it also breaks down nucleic acids (RNA) that carry genetic information. However, the selectivity of RNA degradation and its biological significance were unknown. In this study, we discovered that there is selectivity in the mRNAs that are degraded by autophagy. We also found that mRNAs that are easily degraded maintain their binding to ribosomes, which convert mRNA information into proteins, after autophagy is induced. This study discovered a new phenomenon in which autophagy is involved in gene expression by selectively degrading mRNAs bound to ribosomes.



Multi-Beads Shocker®

In this paper, the Multi-beads Shocker is used to pulverize yeast cells for ribosome profiling. The Multi-beads Shocker allowed us to quickly pulverize yeast cells with liquid nitrogen, which was extremely helpful ---
Dr. Makino Shiho

Dr. Makino Shiho

In 2016, she completed her doctoral studies at the Graduate School of Pharmaceutical Sciences, Tohoku University.

She is currently working as a researcher at the Ohsumi Laboratory, Cellular Engineering Research Center, Institute of Science and Engineering, Tokyo Institute of Technology.

She is researching the molecular mechanisms and biological significance of RNA degradation by autophagy.