Drosophila protease ClpXP specifically degrades DmLRPPRC1 controlling mitochondrial mRNA and translation

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https://doi.org/10.15017/1928629

出版情報：九州大学, 2017, 博士（歯学）, 課程博士
バージョン：
権利関係：

（様式６－２）

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論　文　名	*Drosophila* protease ClpXP specifically degrades DmLRPPRC1 controlling mitochondrial mRNA and translation （ショウジョウバエのプロテアーゼ ClpXP はミトコンドリア mRNA と翻訳を調節する DmLRPPRC1 を特異的に分解する）
論文調査委員	主　査　九州大学　教授　中西　博 副　査　九州大学　教授　山下　喜久 副　査　九州大学　教授　自見　英治郎

論　文　審　査　の　結　果　の　要　旨

ClpXP is the major protease in the mitochondrial matrix in eukaryotes, and is well conserved among species. ClpXP is composed of a proteolytic subunit, ClpP, and a chaperone-like subunit, ClpX. Although it has been proposed that ClpXP is required for the mitochondrial unfolded protein response, additional roles for ClpXP in mitochondrial biogenesis are unclear. In this study, *Drosophila* leucine-rich pentatricopeptide repeat domain-containing protein 1(DmLRPPRC1) was found to be a specific substrate of ClpXP. Deletion or introduction of catalytically inactive mutation of ClpP increased DmLRPPRC1 and caused non-uniform increases of mitochondrial mRNAs, accumulation of some unprocessed mitochondrial transcripts, and modest repression of mitochondrial translation in *Drosophila* Schneider S2 cells. Moreover, DmLRPPRC1 over-expression induced the phenotypes similar to those observed when ClpP was depleted.

These results suggest that ClpXP regulates mitochondrial gene expression by changing the protein level of DmLRPPRC1 in *Drosophila* Schneider S2 cells. Therefore, the thesis is worthy of being defended for the Doctor of Philosophy (Dental Science).