

**Global analysis of RNases from *Thermus thermophilus* HB8**Hiromasa Ohyama<sup>1</sup>, Noriko Nakagawa<sup>1,2</sup>, Seiki Kuramitsu<sup>1,2</sup>, and Ryoji Masui<sup>1,2</sup>(<sup>1</sup> Dept. Biol. Sci., Grad. Sch. Sci., Osaka Univ., <sup>2</sup> RIKEN SPring-8 Center, Harima Inst.)

e-mail: hiromasa@bio.sci.osaka-u.ac.jp

RNA is one of the important macromolecules in the process of gene expression for all organisms. Ribonucleases (RNases) play essential roles in RNA metabolism. Diverse functions of RNases are categorized by RNA substrate and metabolic steps involved such as mRNA degradation, rRNA maturation, tRNA maturation and other RNAs processing and degradation. Many RNases have been studied well and some of them have multiple functions. However, recent several reports have revealed that some essential functions are performed by different RNases in different species. For example, *E. coli* RNase E is essential for mRNA degradation, but its homologue lacks in many bacteria and instead RNase J and RNase Y are assumed to function as a substitute for RNase E. In addition, some (putative) RNases have not assigned yet to a functional category. To elucidate functions of multiple RNases in RNA metabolism, we will perform global analysis of RNases. Since *Thermus thermophilus* HB8 has 12 RNases (Table 1), which are fewer than other organisms, *T. thermophilus* HB8 can be a model organism for the global RNase analysis. Proteins from this thermophile also have advantage in protein crystallization. Actually, the crystal structures of Argonaute and RNase J have been determined. Here, we report an overview of this research and progress to date.

**Table 1. RNases of *T. thermophilus* HB8**

Protein name	ORF ID	Main function
RNase J	TTHA1140	
RNase Y	TTHA1817	
RNase II	TTHA1534	mRNA degradation
RNase R	TTHA0910	
PNPase	TTHA1139	
RNase HIII	TTHA0198	DNA replication
RNase HI	TTHA1556	
RNase P	TTHA0445	tRNA maturation
argonaute	TTHB068	Protection from virus infection
L-PSP	TTHA0137	
$\beta$ -CASP family protein	TTHA0252	unknown function
RecJ-like protein	TTHA0118	