

Structural and functional studies of *Drosophila melanogaster* Snipper

Chun-I Tu(杜春奕), Shu-Ing Toh and Yu-Yuan Hisao

Institute of Molecular Medicine and Bioengineering, NCTU

The family of DEDDh exonuclease (also name RNase T family in pfam database) contain over 30,000 members across more than 7,500 species and is involved in various DNA/RNA processing pathways. Usually, there are plural DEDDh exonucleases in one specie with different cellular functions, thus identifying the correct function of each member is difficult. In *Drosophila melanogaster*, there are four DEDDh exonucleases named Snipper (Snp) isoform D to G, which assembled with different amino acid sequences and un-identified cellular functions. Therefore, we aim to reveal the cellular functions of Snps by biochemical and structural approaches. Our nuclease activity assay indicated that Snp isoform E prefers single-stranded DNA/RNA more than double-stranded DNA/RNA, hence Snp remove 3'-overhang and blocked by the duplex structure of stem-loop DNA. Besides that, Snp isoform E showed lightly higher nuclease activity on RNA than DNA. The crystal structure of apo-Snp isoform E indicated the protein adopts a monomeric constitution containing classical active site residues of DEDDh exonucleases. Both pieces of evidence shown Snp isoform E may participate in RNA maturation process. Our study can pave the way for understanding the cellular functions of *Drosophila melanogaster* DEDDh exonucleases.