

Studies on Arp2/3 complex in a ciliate *Tetrahymena thermophila*

Hiroaki UBUKATA, Kentaro NAKANO and Osamu NUMATA (Biological Sciences, Graduate School of Life and Environmental Sciences, University of Tsukuba)

SUMMARY

Actin-related protein 2/3 complex (Arp2/3) is an evolutionarily conserved 7-subunit protein complex in eukaryotes. Arp2/3 mimics actin dimer and enhances actin polymerization when activated by a WASP-family protein. It is known that Arp2/3 functions in phagocytosis, endocytosis, cell migration and vesicle traffic in mammalian cells, yeast and higher plant cells. However, whether those cellular functions of Arp2/3 complex are conserved in protozoa is still poorly understood. In this study, we investigated cellular functions of Arp2/3 in the ciliate, *Tetrahymena thermophila*. We identified 6 out of 7 subunit genes of Arp2/3 and a WASP gene in *T. thermophila*. Molecular phylogenetic trees reveal that Arp2/3 components have changed moderately through evolution while retaining activity. Immunofluorescence microscopy showed that Arp2/3 is localized in the oral apparatus and food vacuole in *T. thermophila*. In addition, when actin polymerization was suppressed with Latrunculin-B treatment, Arp2/3 still remained in the oral apparatus. Arp2/3 pull down experiments using GST-fused WASP fragments revealed that *Tetrahymena* WASP can interact with both Arp2/3 and actin. These results suggest that Arp2/3 may function in phagocytosis in *T. thermophila* under the control of WASP.