Novel mitochondrial RNA editing found from marine parasitic protists

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Abstract

RNA editing is an important cellular process which results in RNA modification. As RNA editing in metazoan nucleus/cytosol and plants' organelles has been studied well, they play important roles in altering functional proteins and non-coding RNA. It was also known that RNA editing occurs in the mitochondria of several protist species, however, the function of their RNA editing is still controversial. Neither their mediating mechanisms nor evolutionary origins were also well understood. In this talk, I will present RNA editing phenomena which was recently found from ascetosporeans, one of the poorly understood marine parasitic protist groups. Ascetosporeans possess A-to-I and C-to-U substitution types of RNA editing in their mitochondria and the comparison between the specified amino acids before and after RNA editing suggests that they possibly contribute to keep the functional sequences at the amino acid level. In addition, PPR-DYW protein and adenosine deaminase acting on RNA (ADAR)-like protein that may be involved in C-to-U and A-to-I substitutions, respectively, are also detected from ascetosporeans. The molecular phylogeny suggests that their PPR-DYW protein may have been obtained by horizontal gene transfer and the ADAR-like protein may have been vertically inherited from the last eukaryotic common ancestor. The finding from ascetoporeans may be key information to better understand the function and evolutionary process of RNA editing in whole eukaryotes.

Keywords: Aspcetosporea, mitochondria, protist, RNA editing

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