条虫におけるミトコンドリア遺伝暗号

中尾稔*、横山紀子、福長将仁、伊藤亮*

Mol. Biochem. Parasitol., **111**(2): 415-424 (2000)

Mitochondrial genetic code in cestodes

M. Nakao*, N. Yokoyama, M. Fukunaga, A. Ito*

ABSTRACT: The flatworm mitochondrial genetic code, which has been used for all species of the Platyhelminthes, is mainly characterized by AUA codon for isoleucine, AAA codon for asparagine and UAA codon for tyrosine. In eight species of cestodes (*Echinococcus multilocularis*, *Echinococcus granlosus*, *Taenia solium*, *Taenia saginata*, *Taenia hydatigena*, *Taenia crassiceps*, *Hymenolepis nama* and *Mesocestoides corti*), the cytochrome c oxidase subunit I (COI) genes were partially sequenced to verify this genetic code. Comparison of the COI-encoding nucleotide sequences with those of human, sea urchin, fruit fly, nematode and yeast indicated that the assignments of AUA and AAA codons are adequate for cestodes. In addition, the nucleotide sequences of ATPase subunit 6 (ATP6) gene and its flanking region were compared to examine initiation and stop codons. In the related species of *T. solium* and *T. saginata*, the deduced amino acid sequences of ATP6 were homogeneous; however, the conversion of initiation codon AUG into GUG was observed in *T. saginata*. We also found the similar conversion in *T. crassiceps*. The C-terminal sequences of putative ATP6 proteins were highly conserved among the eight species and the stop codon UAG was altered to UAA in all *Taenia* species. The features of the gene-junctional region between NADH dehydrogenase subunit 4 (ND4) and glutamine tRNA (tRNAGln) genes also supported that UAA serves as a stop codon. Based on these results, we propose that the flatworm mitochondrial code should be modified for cestodes, particularly, in an initiating methionine codon (GUG) and a terminating codon (UAA).

抄録　扁形動物門のミトコンドリア遺伝暗号の特徴的なものにAUAはイソロイシン、AAAはアスパラギン、UAAはチロシンが相当していることがあげられる。本論文では、条虫類8種のミトコンドリア蛋白遺伝子COI, ATP6, ND4の遺伝暗号について検討した結果、開始コドンにGUG、終止コドンにUAAが用いられることが明らかにされた。

* 旭川医科大学寄生虫学教室