

Role of the CM2 protein in Influenza C virus replication

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CM2 is the second membrane protein of influenza C virus. Although its biochemical characteristics, coding strategy, and properties as an ion channel have been extensively studied, the role(s) of CM2 in the virus replication cycle remains to be clarified. The author and colleagues generated a number of recombinant influenza C viruses and influenza C virus-like particles (VLPs) possessing CM2 mutation(s) in order to elucidate the role. The recombinant virus lacking CM2 could not be rescued, suggesting that CM2 is essential to the influenza C virus replication. On the other hand, the CM2-deficient VLPs were successfully generated, and analyses of VLP-generating cells, VLPs and VLP-infected cells indicated that CM2 has a potential role in the genome packaging and uncoating processes of the virus replication cycle. To further clarify the roles in the context of viral replication, the recombinant viruses and VLPs with CM2 mutations at its posttranslational modification sites were generated. None of the N-glycosylation, dimer/tetramer formation or palmitoylation were required for virus replication, although the recombinant viruses deficient in CM2 N-glycosylation or dimer/tetramer formation grew less efficiently than did the parental viruses, indicating that the CM2 posttranslational modifications are required for efficient virus replication. Analyses of the VLPs with CM2 mutations at the modification sites also showed the involvement of CM2 in the genome packaging and uncoating processes. In conclusion, we have obtained evidence that CM2 plays a critical role in virus replication.

Biography

Yasushi Muraki graduated from Yamagata University Faculty of Medicine in 1987 and received an M.D. He worked as an Instructor, an Assistant Professor, and an Associate Professor at Department of Infectious Diseases, Yamagata University Faculty of Medicine (1992–2009). He worked as an Associate Professor (2009–2011) and is currently working as a Professor (2011–) at Department of Microbiology, Kanazawa Medical University School of Medicine. In 1996, he received a Ph.D. in the field of Virology at Yamagata University. He worked as a visiting researcher at Division of Virology, National Institute for Medical Research, London, UK (1998–2000).