

[PS1.15]

Singapore grouper iridovirus induced paraptosis-like death in host cells via the activation of MAPK signalling pathways

Qiwei Qin^{*1}, Youhua Huang¹, Xiaohong Huang¹, Yang Yan², Huachun Cui², Jie Gong² et al
¹Key Laboratory of Marine Bioresource Sustainable Utilization (LMB), South China Sea Institute of Oceanology, The Chinese Academy of Sciences, 164 West Xingang Road, Guangzhou 510301, China, ²State Key Laboratory of Biocontrol, School of Life Science, Sun Yat-sen University, 135 West Xingang Road, Guangzhou 510275, China

Virus induced cell death play a critical role in the pathogenesis of viral diseases. Apoptosis and nonapoptotic cell death are the two forms of cell death in response to viral infection. However, the events of nonapoptotic cell death induced by DNA virus and the mechanism involved are much less well understood than those of apoptosis. Singapore grouper iridovirus (SGIV), a large DNA virus, was a novel ranavirus which belongs to family *Iridoviridae*. In present study, we found that SGIV infection in host (grouper spleen, GS) cells evoked cell death with paraptosis-like features, characterized by appearance of cytoplasmic vacuoles and distended endoplasmic reticulum in the absence of DNA fragmentation, apoptotic bodies and caspase activation. Caspase inhibitors were failed to prevent SGIV induced such cytopathic effects (CPE) and cell death. Differently, SGIV induced typical apoptosis in non-host (fathead minnow, FHM) cells, as evidenced by caspase activation, and DNA fragmentation, suggesting that SGIV infection induced paraptosis-like cell death is host cell specific. We further showed that extracellular signal-regulated kinase (ERK) pathway (Raf→MEK→ERK→MSK) was also involved in SGIV infection, and the SGIV infection induced CPE in GS cells was inhibited by ERK-specific inhibitors. In addition, p38 Mitogen-Activated Protein Kinases (p38 MAPK) pathway (MKK→p38→MAPKAPK-2) and c-Jun NH₂-terminal kinases (JNK) signaling pathway (JNK→c-Jun) were activated in SGIV infected GS cells. Together, these data firstly unveiled that SGIV induced host cell specific paraptotic cell death through the activation of MAPK signaling pathways. This study provides a new insight into the pathogenesis of iridoviruses.

Keywords: Singapore grouper iridovirus (SGIV); Paraptosis; MAPK signaling pathway

Keywords: Singapore grouper iridovirus (SGIV), Paraptosis, MAPK signaling pathway