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Pathogenic mechanisms in lung-derived cell line infected with seasonal H1N1 comparing with influenza H1N1 2009 viruses

Tistaya Semangoen
Burapha University, Thailand

The seasonal influenza virus can cause local inflammation at the upper respiratory tract. It can cause mild or severe illness. In 2009, there was a new emerging virus influenza A/swine flu/influenza 2009 which is a combination of swine-lineage influenza virus genes. However, some pathogenic difference between seasonal flu and influenza 2009 in human lung remains unclear and largely unknown. The alveolar epithelial cells (A549) were infected with seasonal flu (A/Thailand/Siriraj-03/2006 (H1N1)) and influenza 2009 (A/Nonthaburi/104/2009 (H1N1)). The IL-6 cytokine in culture supernatant was determined by ELISA. Cell pellet were quantitated cell death by Flow cytometry. The cellular responses of viruses-infected A549 were performed by 2-DE analysis and mass spectrometry. The results showed that there are 19 proteins expression changed after seasonal flu infections. Five proteins were up-regulated whereas fourteen proteins were down-regulated including, Cytokeratin 8, Heat shock protein 90 and Vimentin. Interestingly, there are 7 proteins whose expression changed in influenza 2009-infected A549. Four proteins were increased such as lamin A/C. Three proteins were decreased, receptor of activated protein C kinase 1 and proteasome subunit HsN3. These proteins play important roles in several pathways, especially in viral infection processes. Confirmation of vimentin and lamin A/C expression were performed by 2DE-western blot. This study will enhance the understanding of lung pathogenesis from seasonal flu and influenza 2009 infection, as well as the secretion of cytokines during viral infection which may contribute the severity of tissue pathology. Moreover, these findings may provide the information of molecular mechanisms which leading to the development of new therapeutic targets and strategies.

Biography

Tistaya Semangoen has completed PhD in 2009 from Department of Immunology, Faculty of Medicine Siriraj Hospital, Mahidol University and Post-doctoral studies from Department of Microbiology, Faculty of Medicine Siriraj Hospital. She is the Lecturer at Department of Medical Technology, Faculty of Allied Health Sciences, Burapha University, Thailand. She is the Assistant Dean of Student Affairs of the organization.

mam030@hotmail.com

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