

Identification of miRNA-miRNA Interactions between Virus and Host in Human Cytomegalovirus Infection

Authors : Kai-Yao Huang, Tzong-Yi Lee, Pin-Hao Ho, Tzu-Hao Chang, Cheng-Wei Chang

Abstract : Background: Human cytomegalovirus (HCMV) infects much people around the world, and there were many researches mention that many diseases were caused by HCMV. To understand the mechanism of HCMV lead to diseases during infection. We observe a microRNA (miRNA) - miRNA interaction between HCMV and host during infection. We found HCMV miRNA sequence component complementary with host miRNA precursors, and we also found that the host miRNA abundances were decrease in HCMV infection. Hence, we focus on the host miRNA which may target by the other HCMV miRNA to find theirs target mRNAs expression and analysis these mRNAs affect what kind of signaling pathway. Interestingly, we found the affected mRNA play an important role in some diseases related pathways, and these diseases had been annotated by HCMV infection. Results: From our analysis procedure, we found 464 human miRNAs might be targeted by 26 HCMV miRNAs and there were 291 human miRNAs shows the concordant decrease trend during HCMV infection. For case study, we found hcmv-miR-US22-5p may regulate hsa-mir-877 and we analysis the KEGG pathway which built by hsa-mir-877 validate target mRNA. Additionally, through survey KEGG Disease database found that these mRNA co-regulate some disease related pathway for instance cancer, nerve disease. However, there were studies annotated that HCMV infection casuse cancer and Alzheimer. Conclusions: This work supply a different scenario of miRNA target interactions(MTIs). In previous study assume miRNA only target to other mRNA. Here we wonder there is possibility that miRNAs might regulate non-mRNA targets, like other miRNAs. In this study, we not only consider the sequence similarity with HCMV miRNAs and human miRNA precursors but also the expression trend of these miRNAs. Then we analysis the human miRNAs validate target mRNAs and its associated KEGG pathway. Finally, we survey related works to validate our investigation.

Keywords : human cytomegalovirus, HCMV, microRNA, miRNA

Conference Title : ICMBBB 2016 : International Conference on Molecular Biology, Biochemistry and Biotechnology

Conference Location : Tokyo, Japan

Conference Dates : May 26-27, 2016