HCMV Infection Promote the Cell Proliferation and Migration in Colorectal Cancer Derived-cell Lines

Wan Huai Teo[1*], Hsin-Pai Chen[2], Chia-Lin Lee[3], Jason C Huang[1], Yu-Jiun Chan[3]

[1.] Department of Biotechnology and Laboratory Science in Medicine, National Yang-Ming University, Taiwan, [2.] Division of Infectious Diseases, Department of Medicine, Taipei Veterans General Hospital, Taipei, Taiwan, [3.] Division of Microbiology, Department of Pathology and Laboratory Medicine Taipei Veterans General Hospital, Taipei, Taiwan

Background/Objective

The relationship of human cytomegalovirus (HCMV) and cancer had being studied for decades and recent studies indicated that HCMV is detectable in tumorous tissues such as glioma, colorectal cancer (CRC), prostate cancer and others cancer tissues. It had been proposed that HCMV may mediate the tumor progression and modulate the malignant properties. In recent studies, we disclosed that HCMV was detected in the neoplastic tissue of CRC and the viral nucleic acids were most found localized at the mucosal epithelium, especially the basal layer where the cancer stem cells are localized. Thus we hypothesize that the HCMV may favor to infect and reside at cancer stem cell . Therefore, we would like to investigate the infectivity of HCMV in CRC cell and "stem-like" cells and study their effects in CRC derived cells .

Method

HCMV AD169 was used to infect the HT29 cell and HT29 "stem-like" cells which had pre-subjected to the tumor sphere assays. Immunofluorescence assays was performed to determine the HCMV IE1/2 protein expression and calculated the infected cells. We had performed the cell proliferation and migration assays to study the effect of HCMV infection.

Result

We found that there was increasing of infectivity rate (approximately 40%) in AD169 infected HT29 "stem-like" cells compare to HT29 cell line. We found that after 72 hours post-infection of HCMV in HT29 cells and HT29 "stem-like" cells, it enhanced the cell proliferation, 1.24 fold ($p=0.0023$) and 1.5 fold ($p=0.0012$) respectively. In additionally, infection of HCMV in HT29 cells and HT29 "stem-like" cells also promoted the cell migration. The migration rate in AD169 infected HT29 "stem-like" is 4.6 fold higher compared to AD169 infected HT29 cells.

Conclusion

These results provide a significant phenotypic alteration of CRC cell line when infected with HCMV, especially the "stem-like" cell.