The Role of Apelinergic System in Human Ovarian Cancer Progression

Dr. Jung-Chien Cheng

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Room 1812, PABL

All Are Welcome

APELA is a small, secreted peptide that can function as a ligand for the G-protein coupled receptor, Apelin Receptor (APLNR, APJ). It has been shown that APELA plays an essential role in endoderm differentiation and cardiac development during embryogenesis. However, thus far, whether APELA exerts any biological functions that regulate cancer progression is completely unknown. In this study, analysis of the cancer genome atlas (TCGA) RNA sequencing datasets reveals that APELA mRNA is expressed in different human cancer including in ovarian cancer. Real-time quantitative PCR analyses of clinical human ovarian cancer samples show that APELA mRNA levels are higher in ovarian clear cell carcinoma (OCCC), than other subtypes. Using a CRISPR/Cas9-mediated knockout approach, we demonstrate that APELA knockout suppresses cell growth in the ovarian clear cell carcinoma cell line, OVISE. Decreased cell growth induced by APELA knockout can be partially attenuated by treating cells with recombinant human APELA protein. In addition, flow cytometry analyses show that APELA knockout induces G2/M phase arrest in OVISE cells. Western blot results show that the phosphorylation levels of ERK1/2 and AKT are significantly down-regulated in the APELA deficient OVISE cells. In summary, our study demonstrates that APELA may be an important factor that mediates the progression of OCCC.

Dr. Jung-Chien Cheng, Postdoctoral Research Fellow, BC Children’s Hospital Research Institute, is a candidate for the tenure-track position in Comparative Biomedical Sciences in the Department of Biomedical Sciences.