The Invasiveness Role of PGRMC1 in Cervical Cancer Cell

Shing-Jyh Chang¹, Ying-Jen Chen², Yi-Chieh Lin², Hong-Lin Chan²

¹ Department of Obstetrics and Gynecology, Hsinchu Mackay Memorial Hospital, Hsinchu, Taiwan

² Institute of Bioinformatics and Structural Biology, National Tsing Hua University, Hsinchu, Taiwan

Objectives

Cervical cancer remains a severe disease among the female population, although the mortality rate of cervical cancer is declined due to the widespread applications of Pap smear tests and vaccination. Once patients were diagnosed with metastatic cervical cancer, it usually came with poor prognosis. Therefore, it is important to elucidate the molecular mechanisms underlying cervical cancer invasion.

Methods

Invasive cervical cells HeLa-I5 were selected by transwell invasion assay.

Discovery and validation of potential biomarkers.

In this study, we performed 2D-DIGE, MALDI-TOF/TOF MS, and small interfering RNA to analyze differentially expressed proteins between HeLa and invasive HeLa-I5 cells. The marker expression in metastatic cervical cell line Ca Ski and ME-180 and in cervical tissue microarray were further examined.

Results

Figure 1. The invasive properties of HeLa-I5 cells compared to HeLa cells. (A) The wound healing ability of HeLa and HeLa-I5 cells. (B) The relative wound healing rates. (C) The migration ability and (D) The invasion ability of HeLa and HeLa-I5 cells. * $p < 0.05$; *** $p < 0.001$.

Figure 2. There were 68 proteins differentially expressed between the proteomic profiles of HeLa and HeLa-I5. (A) Functional ontology annotated these proteins are mainly in groups of glycolysis, cytoskeleton, protein folding, and redox regulation. (B) In which, one of the potential candidates called progesterone receptor membrane component 1 (PGRMC1) was higher expressed in HeLa-I5.

Figure 3. PGRMC1 was higher expressed in grade 3 cervical cancer specimens (A-C) and in invasive cell lines (D). (D) The invasive cell lines were found to have EMT characteristic.

Conclusions

1. PGRMC1 plays an essential role in mediating cell metastasis as well as progression in cervical cancer cells and might be a potential target for the treatment of cervical cancer.
2. The clinical application of PGRMC1 needs to be further evaluated.