ABSTRACT

Neuroblastoma is the most common type of extracranial tumor which arises from neuronal ganglia of the peripheral sympathetic nervous system. Peroxisome proliferator-activated receptor gamma coactivator 1-alpha (PGC-1α), which is known normally as a key regulator of mitochondrial biogenesis, is modulated varyingly in different type of cancers, correlating to both protumor and antitumor activity. However, the exact mechanism and effect is still unclear in neuroblastoma. Through this research project, the author plans to elucidate further the role of PGC-1α in the proliferation, migration, and invasion of neuroblastoma cells, using SH-SY5Y neuroblastoma cell line. As the expression level of PGC-1α correlates with its function in mitochondrial biogenesis, the SH-SY5Y cells will be treated with SR-18292 to inhibit PGC-1α expression and ZLN005 to upregulate PGC-1α expression. All-trans Retinoic Acid (AtRA) will also be used to induce differentiation of SH-SY5Y cell line, as multiple studies has commented on the property of AtRA in PGC-1α upregulation and its good prognosis when used as a part of treatment regimens used for multiple type of cancer. Results from assays such as MTS colorimetric assay, BrdU assay, scratch wound-healing assay, and immunocytochemistry, had shown that atRA enhances the expression of PGC-1a which role is predominant in cell differentiation and maturation in the SH-SY5Y cell-line.