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PGC-1α knockdown inhibits cell proliferation, migration, and invasion in human colorectal cancer SW620 cells

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Peroxisome proliferator-activated receptor γ coactivator 1α (PGC-1α) is a master regulator of metabolism. Recently, many investigators have studied the role of PGC-1 in several cancers. However, there are still controversies about the role of PGC-1α in cancers. Especially, our previous report suggested that PGC-1α might be a poor prognosis factor and be related with lymph node metastaisis in patients with colorectal cancer. Based on our previous observation, in this study, we investigated that the effect of PGC-1α knockdown on the cell proliferation, migration, and invasion in PGC-1α expressing human colorectal cancer cell line SW620. We established PGC-1α-shRNA-silenced stable cell line and examined the cell proliferation by cell counts and CFSE staining, migration by scratch test, and invasion by transwell assays. Our results showed that PGC-1α knockdown inhibited cell proliferation, migration, and invasion in SW620 cells. To explain these phenomena, we performed microarray assays with NC shRNA- and PGC-α shRNA-knocked down stable SW620 cells. Microarray results showed that genes are involved in increased cell prolifartion and invasion are downregulated in PGC-1α-shRNA knocked down SW620 cells. We also confirmed the increased expression of E-cadherin and the reduced expression of N-cadherin with Western blot analysis. These results suggest that PGC-1α might upregulate Wnt signaling and lead to increased cell proliferation, migration, and invasion in SW620 cells. Further studies for molecular interactions of PGC-1α in other colorectal cancer cells are needed to confirm our findings. This research was supported by the Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Science, ICT and Future Planning (2017R1A2B4011428, 2016R1C1B2007429).

Biography

Professor Park has studied the cancer molecular biology and biochemistry for 20 years, during which time she has authored more than 50 peer-reviewed papers. She is a member of KSBMB (Korean Society of Biochemistry and Molecular Biology) and AACR.

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