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&amp;

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**Different aspect of electro taxis in long term culture cell related to senescence****Seung Hee Hong, Mi Hee Lee, Min-Ah Koo, Gyeong Mi Seon and Jong-Chul Park**

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Stem cells may differentiate into various cell lineages. Thus, these cells are promising tools for tissue engineering and cell therapies. But stem cells have limited lifespan in vitro, so the use of stem cells are restricted. It has been reported that long-term culture of stem cells causes the cells undergo senescence with cell morphology, alteration in differential potential and proliferating ability. In this study, we confirmed the possibility of applying direct current electric field to cells, known as electro taxis, to be a useful way to distinct cell. We used 3 types of stem cells (TMSC, hMSC, ADSC) and 3 passages (P5, P10, P15) for each stem cells in every experiment. We performed MTT assay to evaluate proliferative ability of 3 types of stem cells. The proliferation rate of stem cells cultured for long term was significantly decreased compared with the early phase passage 5. One of well-known senescence marker, senescence-associated  $\beta$ -galactosidase was stained, and its activity was detected. The number of  $\beta$ -galactosidase stained cells were increased in long term culture compared with the early phase.

The activity of  $\beta$ -galactosidase shown similar pattern compared with  $\beta$ -galactosidase staining. In electric induced cell migration, we applied cells in charge of 1000 $\mu$ A for 3 hours in customized agar-salt electro taxis incubator and chamber system. Early cultured cells move toward anode with directedness direction. But in long-term culture cells directedness has been decreased. In conclusion, our result showed that long term culture of stem cells undergoes senescence which can be known by proliferation assay and senescence-associated  $\beta$ -galactosidase assay. Also, in electro taxis result, different result about passage increasing could be influenced by stem cell senescence which is similar aspect shown in senescence assay. Therefore, applying direct current electric field to cells can be another method to confirm senescence cells.

**Speaker Biography**

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