Brain tumor initiating cell

Brain tumor initiating cells (BTICs) were isolated from three different types of brain tumors. The migration capacities of human adipose tissue derived mesenchymal stem cells (MSCs) (hAT-MSCs) toward BTICs were examined using an in vitro migration assay and in vivo bioluminescence imaging analysis. To investigate the crosstalk between hAT-MSCs and BTICs, Choi et al. analyzed the mRNA expression patterns of cyto-chemokine receptors by RT-qPCR and the protein level of their ligands in co-cultured medium. The candidate cyto-chemokine receptors were selectively inhibited using siRNAs. Both in vitro and in vivo experiments showed that hAT-MSCs possess migratory abilities to target BTICs isolated from medulloblastoma, atypical teratoid/rhabdoid tumors (AT/RT) and glioblastoma. Different types of cyto-chemokines are involved in the crosstalk between hAT-MSCs and BTICs (medulloblastoma and AT/RT: CXCR4/SDF-1, CCR5/RANTES, IL6R/IL-6 and IL8R/IL8; glioblastoma: CXCR4/SDF-1, IL6R/IL-6, IL8R/IL-8 and IGF1R/IGF-1).

The findings demonstrated the migratory ability of hAT-MSCs for BTICs, implying the potential use of MSCs as a delivery vehicle for gene therapy. This study also confirmed the expression of hAT-MSCs cytokine receptors and the BTIC ligands that play roles in their crosstalk [1)].

1)
Choi SA, Lee JY, Kwon SE, Wang KC, Phi JH, Choi JW, Jin X, Lim JY, Kim H, Kim SK. Human Adipose Tissue-Derived Mesenchymal Stem Cells Target Brain Tumor-Initiating Cells. PLoS One. 2015 Jun 15;10(6):e0129292. doi: 10.1371/journal.pone.0129292. eCollection 2015. PubMed PMID: 26076490.