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Effects of exosomes from *Piwil2*-induced cancer stem cells on the proliferation, migration and invasion of fibroblasts cells

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Objective: Recently, several studies have explored the effects of exosomes released from cancer cells and little is understood regarding the functions of exosomes released by cancer stem cells. In this study, we investigated the effects of exosomes released by cancer stem cells on fibroblast cell proliferation, migration and invasion, further to determine the important role of exosomes released from the tumor cells in the development of tumor and may provide the theory for early diagnosis of tumor and metastasis basis for early detection.

Methods: We first isolated the exosomes from *Piwil2* induced cancer stem cells (*Piwil2*-iCSC) by ultracentrifugation, then identified by transmission electron microscopy (TEM), nanoparticle tracking analysis (NTA) and western-blot analysis. Thereafter, these exosomes were co-cultured with fibroblasts (FB) to evaluate cell proliferation, migration and invasion.

Results: The exosomes derived from the *Piwil2*-iCSC had uniform size with diameter of about 30-100 nm, most of them were oval or spherical coated with membrane and rich in four times transmembrane proteins, such as CD9 and CD63. CCK-8 assay suggested that *Piwil2*-iCSC derived exosomes could promote the proliferation of fibroblasts ($P<0.05$). Wound healing experiment revealed that *Piwil2*-iCSC derived exosomes could promote the migration of fibroblasts ($P<0.01$) and transwell assay showed that *Piwil2*-iCSC derived exosomes could promote the invasion of fibroblasts ($P<0.05$).

Conclusion: *Piwil2*-iCSC derived exosomes can promote proliferation, migration and invasion of fibroblasts cells.