

Figure S1. As is shown above in our one independent experiment, mouse ESCs was sequentially differentiating into OPCs.

(A) Under influences of defined culture conditions, mESCs went through several differentiation stages including neural rosettes, neurospheres and NESCs, before shifting cell fate into oligodendrocyte lineage. Arrows indicate the typical morphology of NESCs. All scale bars, 200 μm . (B) Schematic diagram shows the differentiation workflow of mESCs into OPCs under a series of developmental procedures *in vitro*.

Figure S2. Pictures show the self-renewing OPCs.

Treatment of SAG, FGF2 and PDGF-AA, these mESCs-derived long term OPCs maintained the ability to proliferate at least eight passages. All scale bars, 100 μm .