Characterisation and functional analysis of neural crest stem cells in hippocampal neurogenic niche

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Summary

It has been shown that meninges-derived signals promote neuronal production in mouse early embryonic neocortex, and that some meningeal cells themselves migrate into the cortex to differentiate into neurons (Bifari et al., *Cell Stem Cell,* 2017). However, properties of meningeal cells and their function in postnatal neurogenesis remains elusive. Here we examined signalling molecule expressed in meninges, developmental origin of the meningeal cells, and their programmed senescence. Our data show that meninges contain CD271+ neural crest stem cells (NCSCs) that express Raldh2, a synthetic enzyme of retinoic acid (RA). *Ex vivo* culture experiments suggest that RA signal promotes the production of BLBP+ radial glia (*i.e.* neural stem cells) and Olig2+ glial cells in postnatal dentate gyrus. Meninges-derived origanoid culture experiments also show that CD271+ NCSCs proliferate and differentiate into not only Foxc2+ meningeal fibroblasts but also MAP2+ neurons. Further, some of them undergo programmed senescence. Future studies will be necessary to further investigate 1) the function of meninges-derived RA signal in postnatal hippocampal neurogenesis, 2) the molecular mechanism of the programmed senescence in meninges and its biological significance.