AB017. Investigation of the effect of lymphocyte-derived microparticles on retinal macrophages in the oxygen-induced retinopathy model

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Background: Retinopathy of prematurity (ROP) is the major cause of blindness in children, mainly caused by the retinal neovascularization (NV). Mounting of evidences shown that macrophage plays a pivotal role in the regulation of angiogenesis in ROP. Numerous studies confirmed that the deletion of macrophage significantly reduce the neovascularized areas in the oxygen-induced retinopathy (OIR) model. We have been studied the effect of lymphocyte derived-microparticles (LMPs) over ten years. LMPs are extracellular vesicles derived from apoptotic human CEM T lymphocytes. Our previous studies demonstrated that LMPs possess strong anti-angiogenic effect. Recently we observed that LMPs are capable to switch the phenotype of macrophage, thus to suppress the choroidal neovascularization (CNV). However, the role of LMPs on macrophage in ROP has not been clarified. Thus, my project is to disclose the relationship between LMPs and macrophage in ROP using the OIR model. Hypothesis: LMPs may inhibit retinal NV in the OIR model through targeting at macrophage by affecting the migration of macrophage, thus to inhibit pathological angiogenesis in ROP.
Methods: Cell culture [RAW 264.7 and bone marrow-derived macrophage (BMDM)] for cell migration and viability assay. Generate the OIR model for *in vivo* detection of macrophage recruitment. Quantification of retinal NV, immunohistostaining of the macrophage *in vivo*, *ex vivo* retinal explants for cell migration and qPCR.
Results: LMPs do not affect RAW 264.7 and BMDM cell viability ($P>0.05$). LMPs significantly decrease the BMDM cell migration indirectly ($P<0.05$). I successfully generate the OIR model and confirm that more macrophages infiltrate during retinal angiogenesis with counting the F4/80 immunostaining in the retinal flat mount. LMPs exert inhibiting effect on retinal angiogenesis through decreasing the migration of macrophages *in vivo*.
Conclusions: LMPs have the negative effect on retinal angiogenesis via reducing the infiltrated macrophages to the neovascularized areas in the OIR model.
Keywords: Retinopathy of prematurity (ROP); anti-angiogenesis; microparticles; oxygen-induced retinopathy (OIR)

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