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生後初期脳のリスクアセスメントシステムの構築

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The brain is so vulnerable in the early postnatal stage and the environmental changes might cause permanent impairments in brain functions. To assess risks in the brain at the early postnatal stage, we are establishing the organotypic slice culture of the postnatal rat forebrains that have neural progenitors labeled by eGFP-encoding retrovirus (pNIT-GFP). In this study, we compared the development of oligodendrocyte progenitors in this in vitro model with that in the in vivo control. In the in vitro model, 150 μm sagittal sections of forebrains were made at P1, pNIT-GFP was applied on the subventricular zone (SVZ) under the microscope, and the sections were cultured for 3 days. As an in vivo control, we stereotaxically injected pNIT-GFP into SVZ of P1 rats and sagittal sections were made at P4. The rate of O1 positive cells (oligodendrocyte progenitors) in GFP-positive cells and their migration pattern in the in vitro model were almost same as those in the in vivo control. Pharmacological experiments can be performed in this slice culture system. This in vitro model can be applied to the risk assessment system of the brain at the early postnatal stage.