

RADIAL GLIA IN THE ADULT BRAIN

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Radial glial cells provide frameworks for migration of newborn neurons from the ventricular and sub ventricular zones (SVZ) to their final position in the developing brain. They are progenitors for many neurons and glial cells soon after birth and continue to be produced in the adult brain. In adult lateral ventricular wall, they generate self-renewing, multipotent neurospheres and new neurons that migrate through the rostral migration stream to the olfactory bulb. They become the neural stem cells that reside in the other neurogenic regions of the adult CNS. Radial glial cells have also been proposed as a source of trophic substances, promoting the generation, differentiation, and/or survival of new neurons. Radial-like glial cells reappear in the mouse adult brain and interact with migrating cells following implantation of human glioblastoma cells. Migrating glioma cells were closely apposed to thin long processes, of those radial cells, replicating a developmental program associated to neuroplasticity in the adult brain. Astrocytes submitted to diffusible chemical signals from embryonic brain in vitro, and to freezing injury in vivo, give rise to de-differentiated, rejuvenated immature radial glia-like cells. Thus, radial glial cells have emerged as a multifunctional cell type, central to many aspects of CNS development and plasticity. Their functions contribute not only to the potential of the intact brain to generate new neurons continuously, but provide also an essential part of the cellular substrate of brain plasticity.

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