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Neurogenesis in the supraependymal region of the adult rat

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The subgranular zone in the hippocampus and walls of the lateral ventricles continue to generate neurons in the adult mammalian brain. Questions concerning the occurrence of similar adult neurogenic niches are still open. In this regard, the current study focused on understanding the neural stem cell like characteristics of supraependymal cells (SEC) of the third ventricle in rat. In this study, 16 Wistar rats weighing 150-200 g were divided into four groups. Group I was used as normal control, group II and III for unilateral and bilateral cervical sympathectomy respectively and group IV as sham control. Fourteen days after the experiment, the floors of the third ventricle of all animals were studied by scanning electron microscopy (SEM). For SEM analysis the animals were perfused under anesthesia transcardially with 3% glutaraldehyde, the brains were dissected out and processed. SEM analysis showed distinct clusters of SEC on the surface of the third ventricle. These cells are immersed in the cerebrospinal fluid and enjoy a unique environment in the mammalian brain. Fourteen days after unilateral cervical sympathectomy, there was a profound increase in the number of supraependymal neurons on the surface of the third ventricle. From these studies, it can be concluded that SEC of the third ventricular floor show neural stem cell like characteristics and may represent another stem cell niche in the adult rodent brain. Further studies are necessary to understand the clinical significance and the signaling mechanisms that induce proliferation and differentiation of SEC.

Biography

Thazhumpal Chacko Mathew completed his PhD from the University of Alberta, Canada in 1992 and obtained FRCPATH (UK) in 2003. In 1983, he had undergone Research Training at the University of Lund, Sweden. After his Post-doctoral studies at the University of Alberta, he worked as Assistant Scientist at NYU, USA. In 1993, he joined the FAHS of Kuwait University. Currently, he is Professor and Vice Dean for Research. He was also the Director of the Electron Microscope Unit. His research interest is in Molecular Neurobiology. He received several awards and published more than 75 papers and attended over 100 conferences.

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