FOR 1336

Developmental Specialization or Local Adoption: The Case of "New Microglia"

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Project Leader
Professor Dr. Ingo Bechmann
Universität Leipzig
Medizinische Fakultät
Institut für Anatomie

Project Description:

Microglia represent a stable population of brain antigen-presenting cells (APC) which differ from other APC by their immune phenotype and their radio-resistance. Upon irradiation and anterograde axonal degeneration induced by entorhinal cortex lesion CCR2+ precursors are recruited and adapt to the local environment in that they morphologically transform into ramified microglia. At present it is unknown whether irradiation and axonal injury-induced intraparenchymal recruitment is dependent on the induction of metalloproteinases (MMP) -2 and -9 as it has been shown for autoimmune encephalomyelitis (EAE) and pertussis toxininduced neuroinflammation. It is also unclear if the local adoption involves phenotypical changes and radio-resistance which are typical of intrinsic microglia. In fact, we found that microglia has a strong capability of repairing DNA after irradiation. In this proposal, we have, therefore, three major aims: 1. Determining whether and, if so, at which part of the vascular tree, MMP-2 and -9 are upregulated after irradiation and axonal injury, 2) studying whether invaded mononuclear cells adopt phenotypically and 3) whether they acquire radioresistance typical of microglia.

Reference: https://gepris.dfg.de/gepris/projekt/165174716