IJAE
Vol. 119, n. 1 (Supplement): 21, 2014
ITALIAN JOURNAL OF ANATOMY AND EMBRYOLOGY

Human and murine microglial cell lines: two experimental models to deeply understand the mechanism of microglia involvement in human brain diseases

Jacopo J.V. Branca[1], Gabriele Morucci[1], Massimo Gulisano[1], Marco Ruggiero[2], Ferdinando Paternostro[1], Alessandra Pacini[1], Lorenzo Di Cesare Mannelli[3], Stefania Pacini[1]

[1] Department of Experimental and Clinical Medicine, University of Firenze, 50134 Firenze, Italy
[2] Department of Clinical and Biomedical Experimental Sciences, University of Firenze, 50134 Firenze, Italy
[3] Department of Neurosciences, Psychology, Drug Research and Child Health, Section of Pharmacology and Toxicology, University of Firenze, 50134 Firenze, Italy

Microglia act as a first line of defence against pathogen invasion, by recognizing, sequestering and processing antigens. Once microglia become activated, they produce and release many substances that activate nearby astrocytes, microglia and neurons (Martin et al., 2005). In this study we compare two microglial cell lines: the human cell line c13-nj and the murine microglia cell line BV-2. BV-2 are commonly available on the market but their main limitation consists in the fact that they are not human thus limiting their use for the study of human brain diseases. On the contrary, the human c13-nj cell line, which would be the most appropriate to investigate the role of microglia in human brain diseases, is not commercially available. In this study we compare the cell viability, the cAMP formation, the VEGF expression as well as the expression of a specific marker of microglial activation (B7-2) after treatment with a toxicant (oxaliplatin) and with a protective agent (GcMAF) on BV-2 and on c13-nj (kindly donated). Our results show that the human microglial cell line is more resistant to toxicants such as oxaliplatin; however, the signal transduction pathways activated when the two cell lines are treated both with oxaliplatin and with GcMAF, are the same. This lead us to hypothesize that the murine microglial cell line (BV-2) can be considered as a superimposable model in studies concerning human brain representing an excellent experimental model, not expensive, easy to culture and to retrieve.

References

[1] Martin et al. (2005) Neurotensin and the Neurotensin Receptor-3 in Microglial Cells. J Neurosci Res 81: 322-326.

Keywords

Human microglia, VEGF, B7-2, oxaliplatin, GcMAF.