

Name: Maya Otto-Duessel

E-mail: cbergman@hsc.usc.edu

Analysis of MHC Expression on Astrocytes Derived from Neonates and Adult Mice

Maya Otto-Duessel^{1,2}, Stephen Stohlman^{1,2} and Cornelia Bergmann^{1,3}

Departments of Neurology¹, Molecular Microbiology and Immunology² and Pathology³,
University of Southern California, Keck School of Medicine, Los Angeles

The up-regulation of MHC class I and class II molecules on astrocytes during viral infection of the CNS is controversial. Transgenic mice expressing the green fluorescent protein (GFP) under the control of the glial fibrillary acidic protein (GFAP) promoter were used to isolate and analyze astrocytes from adult brains and spinal cords by flow cytometry. Using a mild trypsin treatment to dissociate tissue, approximately 9% and 12% of cells were GFP positive in brain and spinal cord from naïve mice, respectively. To monitor MHC expression during inflammation, six week old transgenic mice were injected intra-cerebrally with a neurotropic strain of mouse hepatitis virus designated v2.2-1 and CNS tissue analyzed at 3, 5, 7 and 12 days post-infection (p.i.). Astrocytes from naïve adult transgenic mice were negative for both MHC class I and II molecules, whereas 90% of astrocytes isolated 5 days p.i. were positive for MHC class I. MHC class II upregulation was delayed compared to MHC class I and was only expressed on a small percentage (~20%) by day 7 p.i. By this time 87 % of microglia expressed class II at high levels compared to astrocytes, indicating paucity of astrocytes to upregulate class II *in vivo*. In contrast to astrocytes in adult mice, primary astrocytes cultured from neonates expressed MHC class I spontaneously (~50%), and further up-regulated class I molecules upon stimulation with interferon gamma. Interferon gamma treatment also induced MHC class II expression to high levels *in vitro*, contrasting the low levels expressed *in vivo* following CNS infection. These data suggest that astrocytes can participate in presenting Ag to CD8 T cells, but only have limited capacity for class II Ag presentation during CNS infection of adult mice.

Supported by NS18146