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Behavioural signatures of neuroinflammation

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Multiple sclerosis is an autoimmune demyelinating disease that affects more that 2.5 million people worldwide. Biochemical and *in vitro* data put forward many therapeutic candidates that have to be verified *in vivo* models of MS. Experimental autoimmune encephalomyelitis (EAE) is a widely utilized model that replicates many aspects of MS. The traditionally used assessment of behavioural outcomes is performed by two independent observers in the blind to experimental setup manner. Such way of assessment is person dependent and allow only evaluate a small number of parameters. Also, the scores often are different among different laboratories. Here we propose to utilize 40 parameters behavioural assessment during development and progression of EAE. We used 24hr/day recording of animals before and three weeks after induction of EAE. The films were analysed using Clever Sys software. We found dramatic differences in behavioural outcomes even within the first week of the EAE induction. First, we noted a significant reduction of total distance walked per day. Mice with EAE walked two-fold less after 1-week post-EAE and four-fold less after two weeks of EAE. Hanging behaviour significantly declined (up to 30 fold) in mice within two weeks of EAE. On the other hand, grooming behaviour significantly increased in the first week of EAE. Detailed analysis of mouse activity revealed that mice are most active between 20h and 24h and least active during 11h and 15hr. In conclusion, we demonstrate that multiple parameter automated analysis of behavioural outcomes may help to validate therapeutic targets and give insights into the mechanisms of the neuroinflammation during MS.

Biography

Denis Gris is a head of neuroimmunology laboratory at the University of Sherbrooke QC Canada. He graduated from University of Western Ontario from Dr. Weaver's laboratory where he studied inflammation after spinal cord injury. Dr. Gris moved to pursue his postdoctoral studies with Dr. Ting at university of North Carolina at Chapel Hills NC USA where he began to investigate role of NLRs in neurodegeneration. His main interest is to discover novel anti-inflammatory pathways within the central nervous system and use this knowledge to design therapies for neurological diseases including multiple sclerosis amyotrophic lateral sclerosis autism and epilepsy.

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