

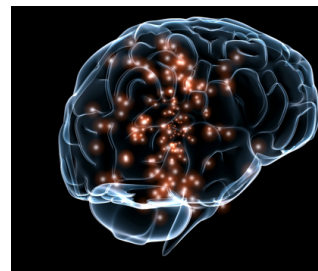
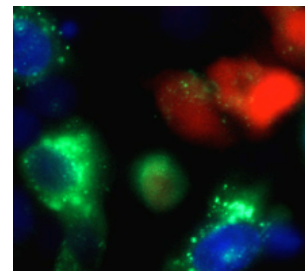
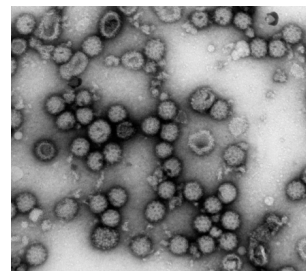
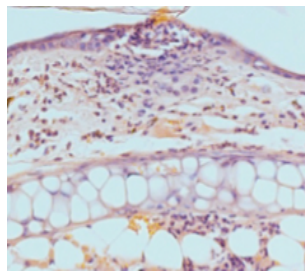


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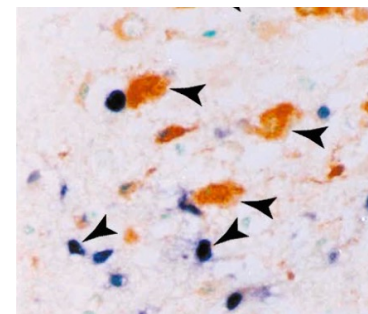
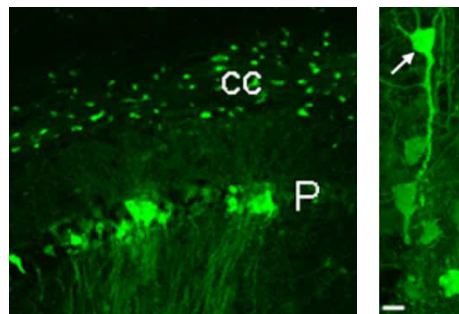
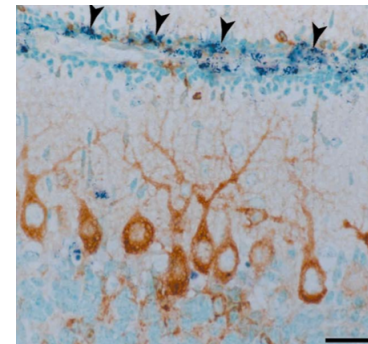
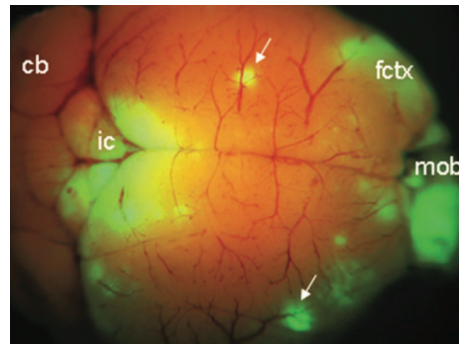
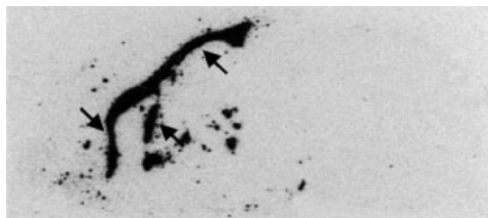
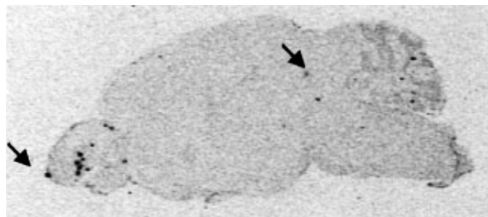
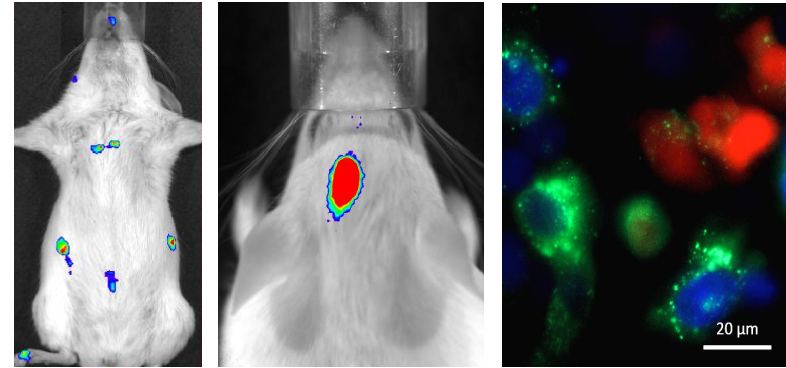
Clive McKimmie
Marieke Pingen
Steven Bryden

**Using neurotropic viruses to understand CNS
immune responses and neural cell function**



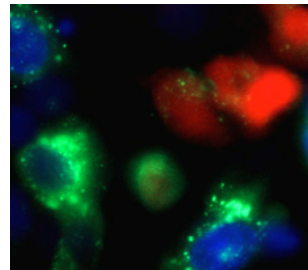
Background: Semliki Forest Virus (SFV)

- spread by mosquitoes
- infects mouse brain
- multiple genetically modified strains; marker genes
- John Fazakerely, Alain Kohl, Anders Merits

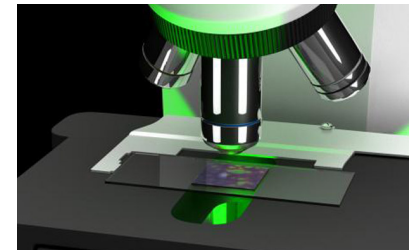
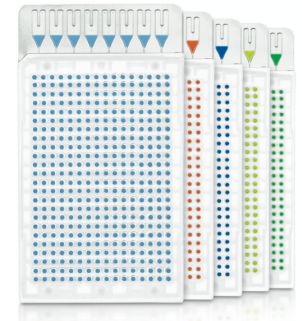


Methods employed

Models: in vivo veritas

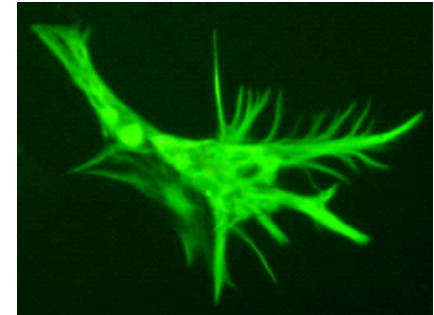
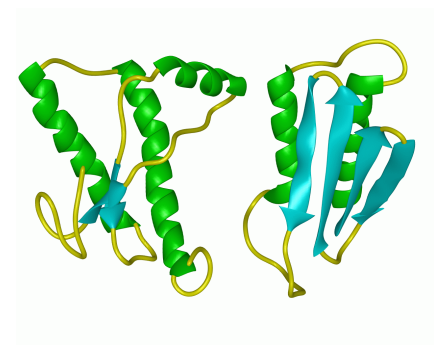
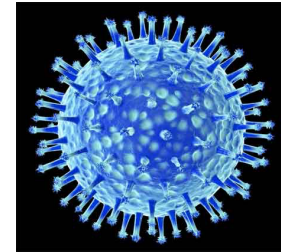


Techniques

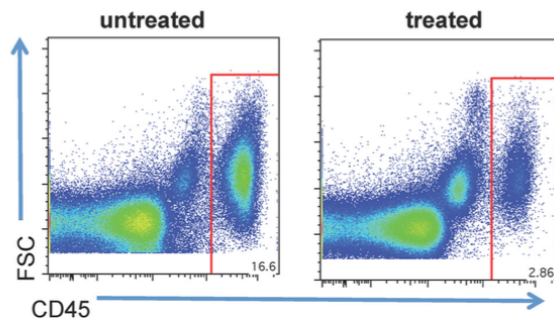
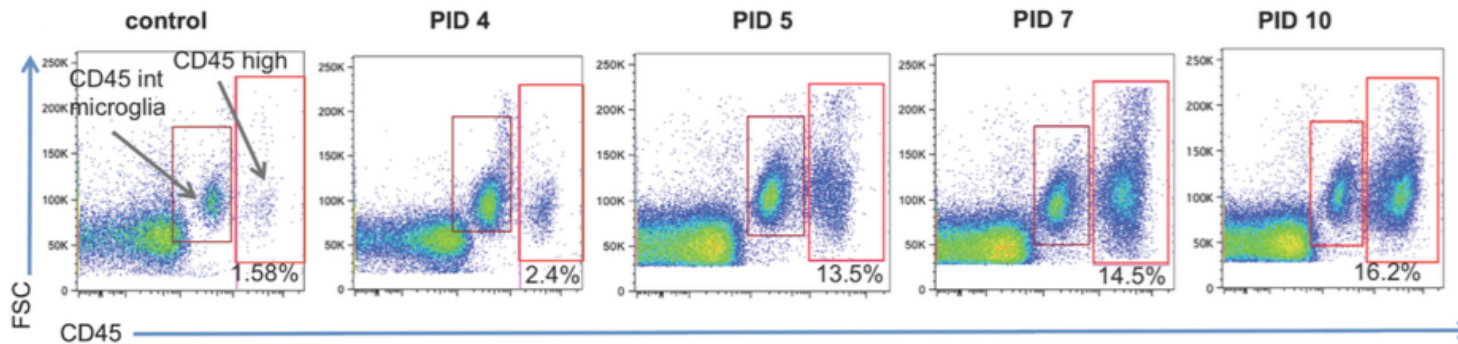
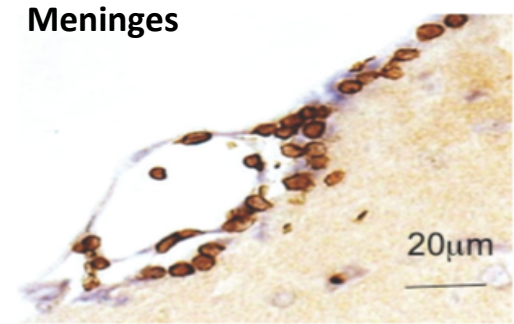
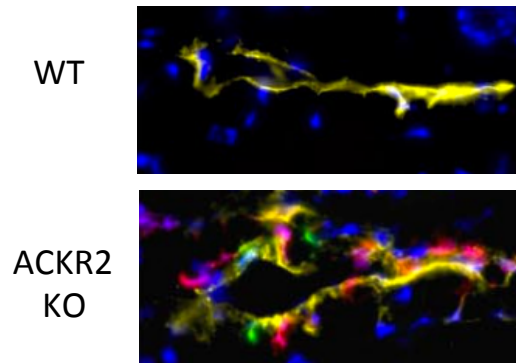


Innate immune system of the brain

- How does CNS detect infection?
- Innate immune system?
- Glia have **Toll Like Receptors**
 - TLR3
- Up-regulated by infection/cytokines



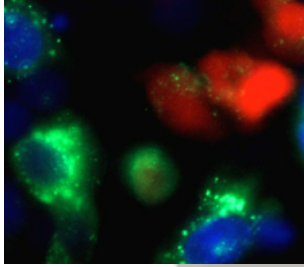
How chemokines control inflammation



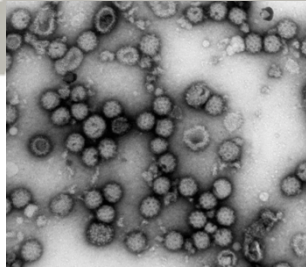
- McKimmie et al (2009) **Blood**
- Lee and McKimmie et al (2011) **Blood**
- McKimmie et al (2013) **Blood**
- Michlmyar et al (2014) **J. Virology**

How do events in the periphery affect CNS infection?

viral dissemination



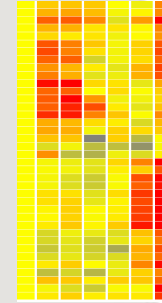
viral replication



CNS disease

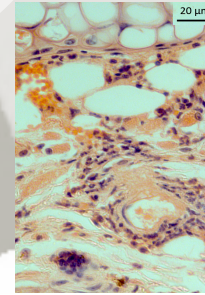


- In vivo model systems
- How does virus get to CNS?
- Can therapy at bite site affect CNS?



inflammation

leukocyte recruitment

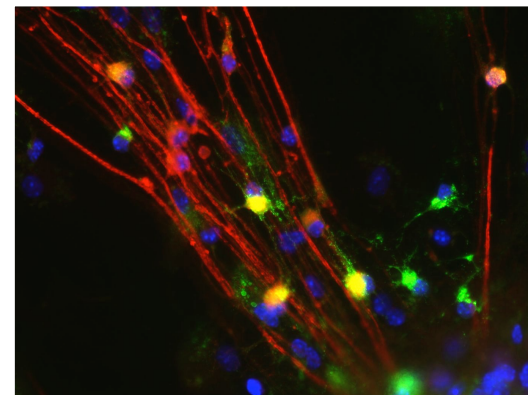


Arthropod bite

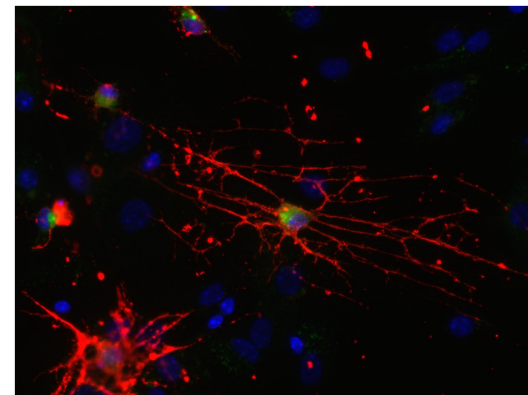
New collaboration: MS antibodies and viruses

- Julia Edgar / Chris Linington
 - MS antibodies and immune dysfunction
 - Using viruses to define their function
 - MS antibodies protect cells from infection
- **Combining expertise** in myelinating cultures and molecular virology
- Using viruses as a tool to understand CNS disease

Virus PLP DAPI



Virus O4 DAPI



Next steps: collaboration

Interdisciplinary studies synergise to generate higher impact research

- share resources and expertise
- clive.mckimmie@glasgow.ac.uk



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