**Immature brain cortical neurons have low transcriptional competence to activate antiviral defences and control RNA virus infections**

Divya Narayanan1, Nagaraj Moily2, Hayley A. McQuilten1, Katherine Kedzierska1, Jason M. Mackenzie1, Lukasz Kedzierski1,3¶ and John K. Fazakerley1,3¶

1Department of Microbiology and Immunology at the Peter Doherty Institute of Infection and Immunity, The University of Melbourne, Australia

2Department of Biochemistry and Molecular Biology, Bio21 Molecular Science and Biotechnology Institute, The University of Melbourne, Australia

3Faculty of Veterinary and Agricultural Sciences at the Peter Doherty Institute of Infection and Immunity, The University of Melbourne, Australia.

*¶ these authors contributed equally to this work*

Short title: Neurons and RNA virus infection.

Corresponding authors:

Prof John K. Fazakerley **E:**[john.fazakerley@unimelb.edu.au](mailto:john.fazakerley@unimelb.edu.au)

Dr Lukasz Kedzierski **E:** lukaszk[@unimelb.edu.au](mailto:john.fazakerley@unimelb.edu.au)

Department of Microbiology and Immunology

Peter Doherty Institute of Infection and Immunity

University of Melbourne

729 Elizabeth St., Melbourne 3000, Australia

Tel. +61 3 9731 2261

Keywords: alphavirus, interferon, neuron, innate immunity

**Supporting Information**

**Supplementary Table S1.** A list of the highly variable genes in three major bands presented in Fig. 4A.

**Supplementary Figure S1. Pathway activation and upstream transcriptional regulator activation profiles following pre-treatment with IFNβ and SFV infection. (**A) Heatmap showing clustering analysis of the key predicted pathways altered in immature and mature neurons in response to IFNβ pre-treatment and SFV infection. The activated pathways are coloured red and inhibited pathways are coloured blue based on the activation Z-score. Upstream transcriptional activation in response to IFNβ pre-treatment and SFV infection in mature (B) and immature (C) neurons. Upstream transcriptional regulators with p value <0.05 and predicted to be activated or inhibited (absolute Z-score >3) were considered in the analysis. The activated pathways are coloured red and inhibited pathways are coloured blue based on the activation Z-score.