

## P9.24

### A multivalent stage-specific vaccine against *Fasciola hepatica* in sheep

Luke Norbury<sup>1</sup>, Anna Zawistowska-Deniziak<sup>1</sup>, Katarzyna Basalaj<sup>1</sup>, Alicja Sielicka<sup>1</sup>, Agnieszka Wesolowska<sup>1</sup>, Przemyslaw Wilkowski<sup>1</sup>, Peter M. Smooker<sup>2</sup>, Halina Wedrychowicz<sup>1</sup>

<sup>1</sup>*The Witold Stefanski Institute of Parasitology, Polish Academy of Sciences, Warsaw, Poland,* <sup>2</sup>*School of Applied Sciences, RMIT University, Bundoora, Victoria, Australia*

*Fasciola hepatica* is an important veterinary parasite, predominantly infecting sheep and cattle. A multivalent vaccine, comprised of recombinant versions of *F. hepatica* stage-specific proteases, has shown promising results in a rat model. In this work we assessed the efficacy of the vaccine in sheep, through both intramuscular and mucosal forms of vaccination.

The vaccine under investigation incorporates two stage-specific proteins, FhCL5 and FhCB2. The vaccine trial involved forty sheep, divided into 5 groups. Sheep received 3 doses of vaccine, either intramuscularly, with antigens mixed with the adjuvant QuilA, or nasally with the antigens mixed with a saponin-based delivery system. The other sheep groups were exposed to the appropriate adjuvant controls, or left untreated.

Subsequently, the sheep were challenged with *F. hepatica* metacercariae. The cellular and humoral immune responses generated by the vaccine and subsequent challenge were analysed using a range of immunological assays.

Nasal vaccination was able to stimulate a systemic immune response; however, antibody titres were significantly higher following intramuscular vaccination. Despite the significantly higher antibody responses following intramuscular vaccination, the protective effect following vaccination was not significant. However, reductions in fluke burdens were observed following nasal vaccination, and flukes also produced fewer eggs. The data indicate that while the promising results achieved in the rat model did not directly translate into success in the sheep definitive host, mucosal vaccination does offer potential in future vaccination strategies. Project funded by NCN grant no. 2012/06/M/NZ6/00115.