Title; Neoblast-like cell dynamics and growth in the liver fluke *Fasciola hepatica*;

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Fasciola hepatica (liver fluke) infections of livestock challenge food production systems globally. Control relies heavily upon the drug triclabendazole, but this over reliance has led to widespread issues of resistance. Key players involved in fluke growth appear to be proliferative cells that are neoblast-like. Neoblasts play a major role within free living planarian flatworms where they facilitate their remarkable regenerative abilities, however their roles in parasitic flatworms are less well established. We have identified proliferative 'neoblast like' cells within both juvenile and adult *Fasciola hepatica*. This project sets out to characterise these cells and their regulators to develop an understanding of their role and significance to fluke biology.

Here these proliferative cells have been localised in juvenile fluke at various stages of development and under distinct nutritional environments to examine their dynamics. Two day old juveniles maintained in nutrient-rich media had ~2x more proliferative cells than juveniles in unsupplemented media. By seven days of age juveniles in nutrient rich media had >90% more proliferative cells than juveniles maintained in standard media, exposing the dramatic impact of serum on cell proliferation in growing juveniles. Profound differences were observed in the dynamics of neoblast-like cells in juveniles at different stages of development and in *in vivo* compared to *in vitro* maintained juveniles, consistent with the notable differences in the growth rates of these two groups.

An underpinning hypothesis is that these cells are somatic stem cells which fulfil similar roles to those reported in the related blood fluke, *S. mansoni.* These cells could be valuable as a source for new control targets due to their integral role in parasite growth, development and virulence.