

INTRODUCTION

- Schistosoma mansoni causes the disease schistosomiasis



Fig 1:
Pathological
effects of
schistosomiasis

- Schistosomes have a complex life cycle

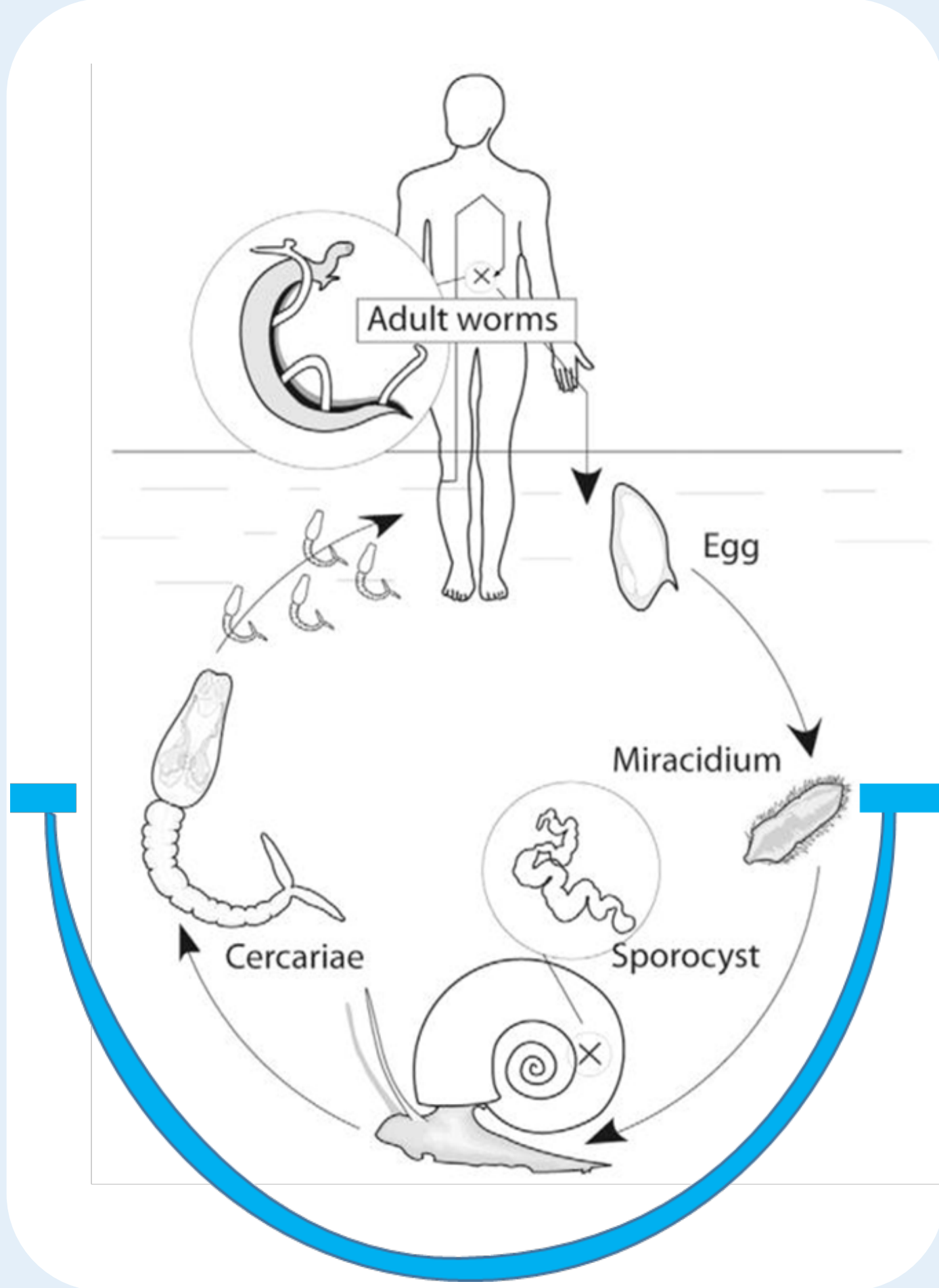


Fig 2:
Schistosoma
mansoni life cycle

- Kin selection theory predicts that closely-related parasites will be less competitive and therefore have lower virulence than unrelated parasites.

MATERIALS & METHODS

- 25 snails were exposed to either one or two parasite strains

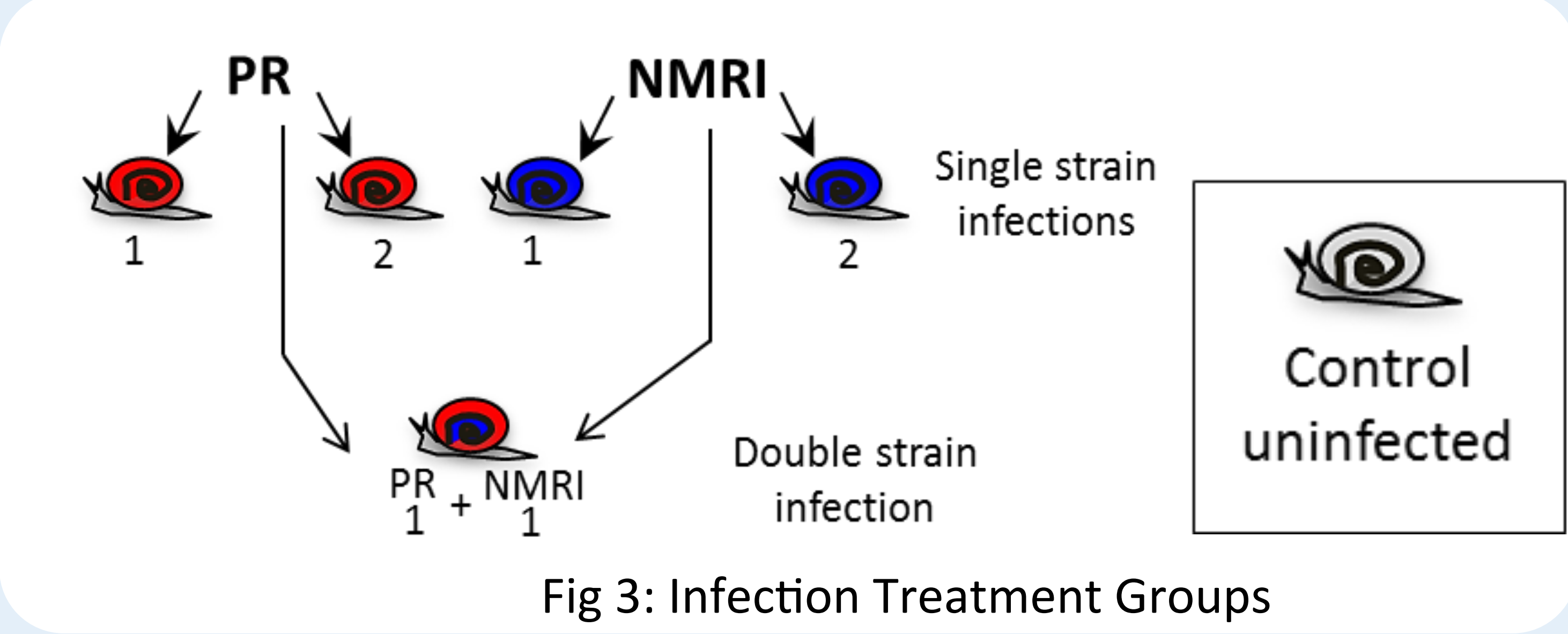


Fig 3: Infection Treatment Groups

- Host mortality and reproduction and growth were measured
- Parasite reproduction was measured and cercariae samples were collected
- Experiment continued until host death
- Cercariae samples were analyzed by Quantitative Polymerase Chain Reaction (qPCR) to calculate relative strain reproduction in co-infection and to verify our treatment groups

STRAIN EFFECTS

- Parasite reproduction varied between the two strains

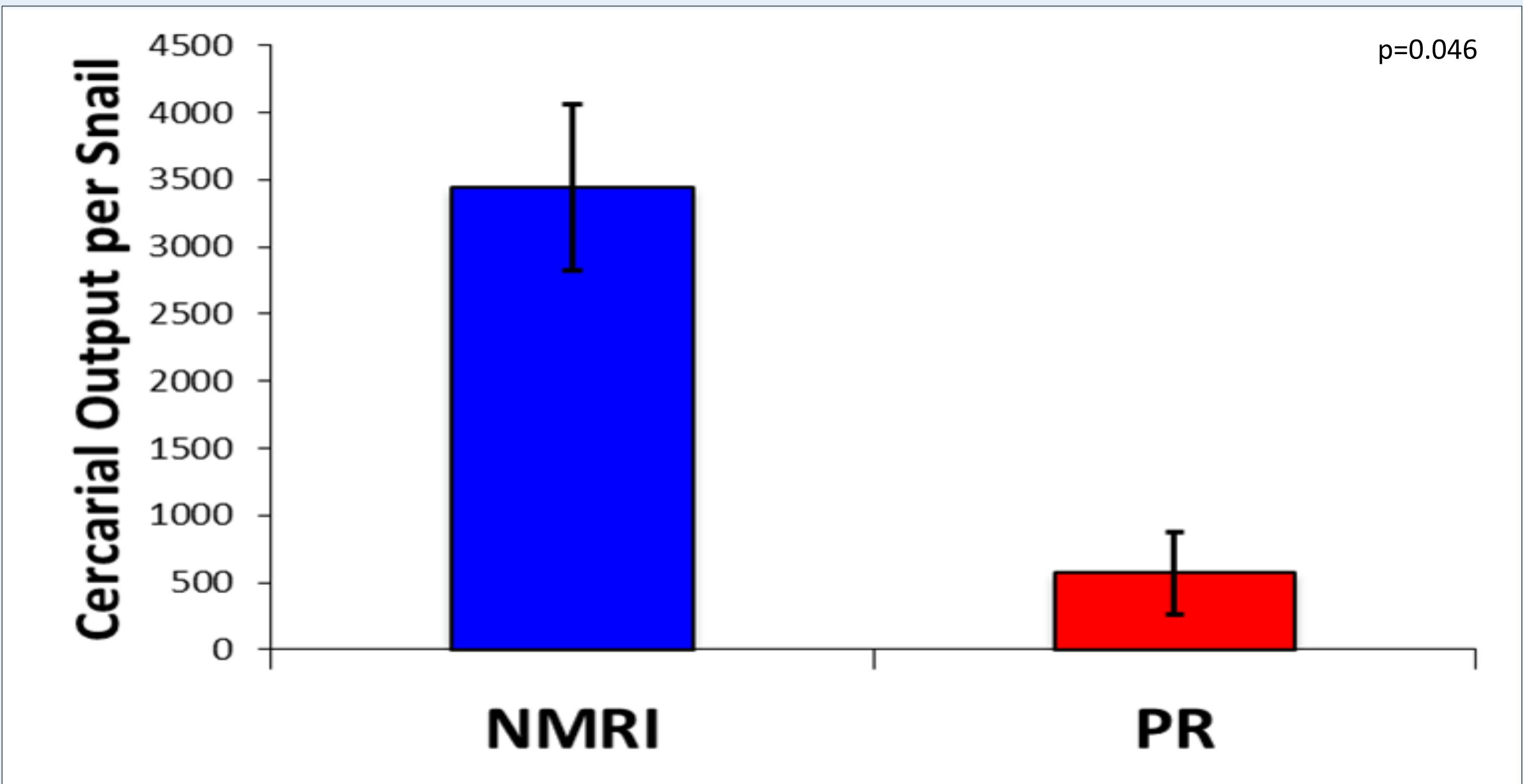


Fig. 4: NMRI had much greater lifetime cercarial output than PR, $p=0.046$

- Host mortality was greatly affected by infection composition

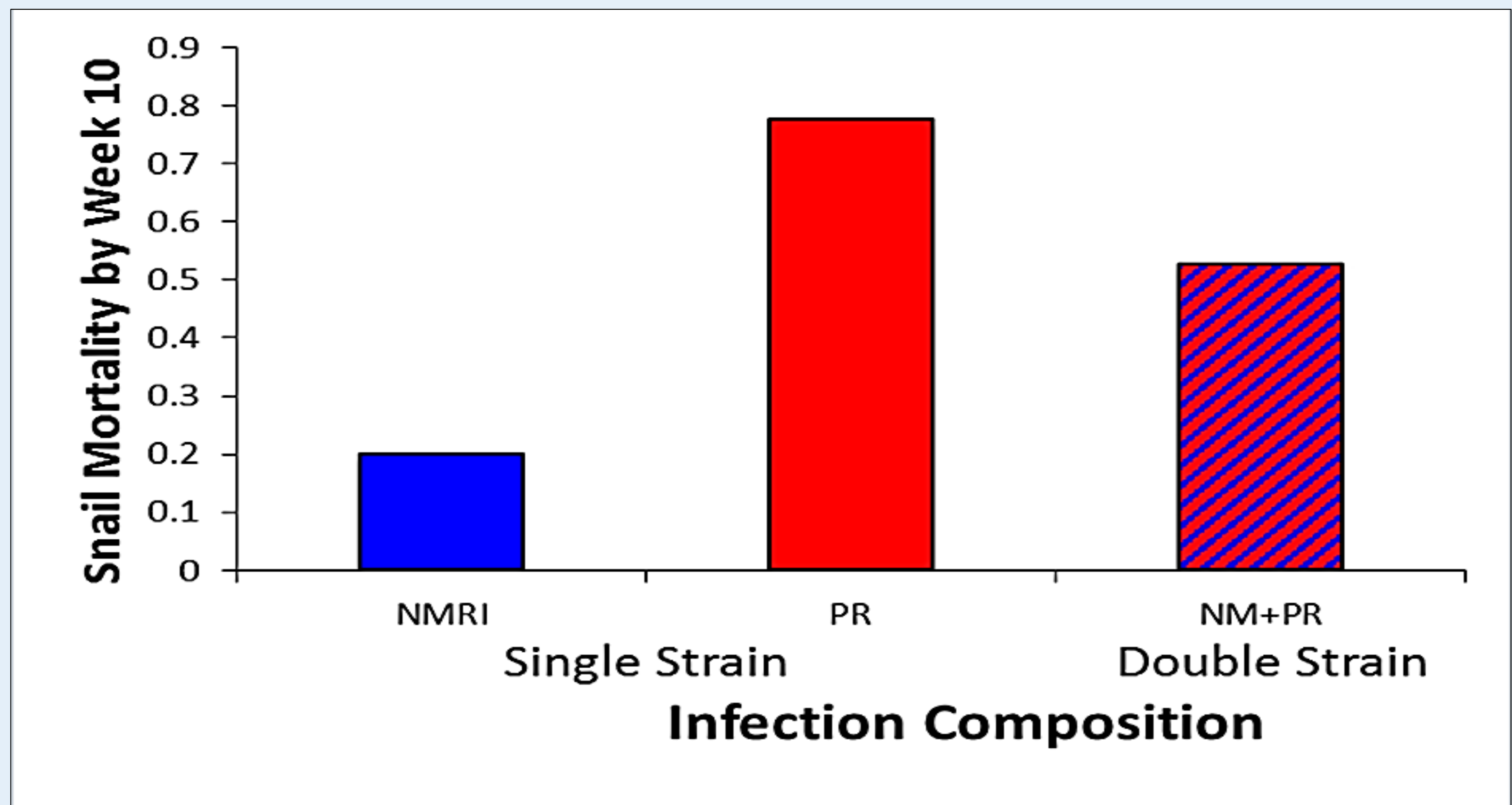


Fig. 5: Single-strain PR infections were deadlier than double-strain infections and single-strain NMRI infections.

- Host reproduction was lower for double strain infections

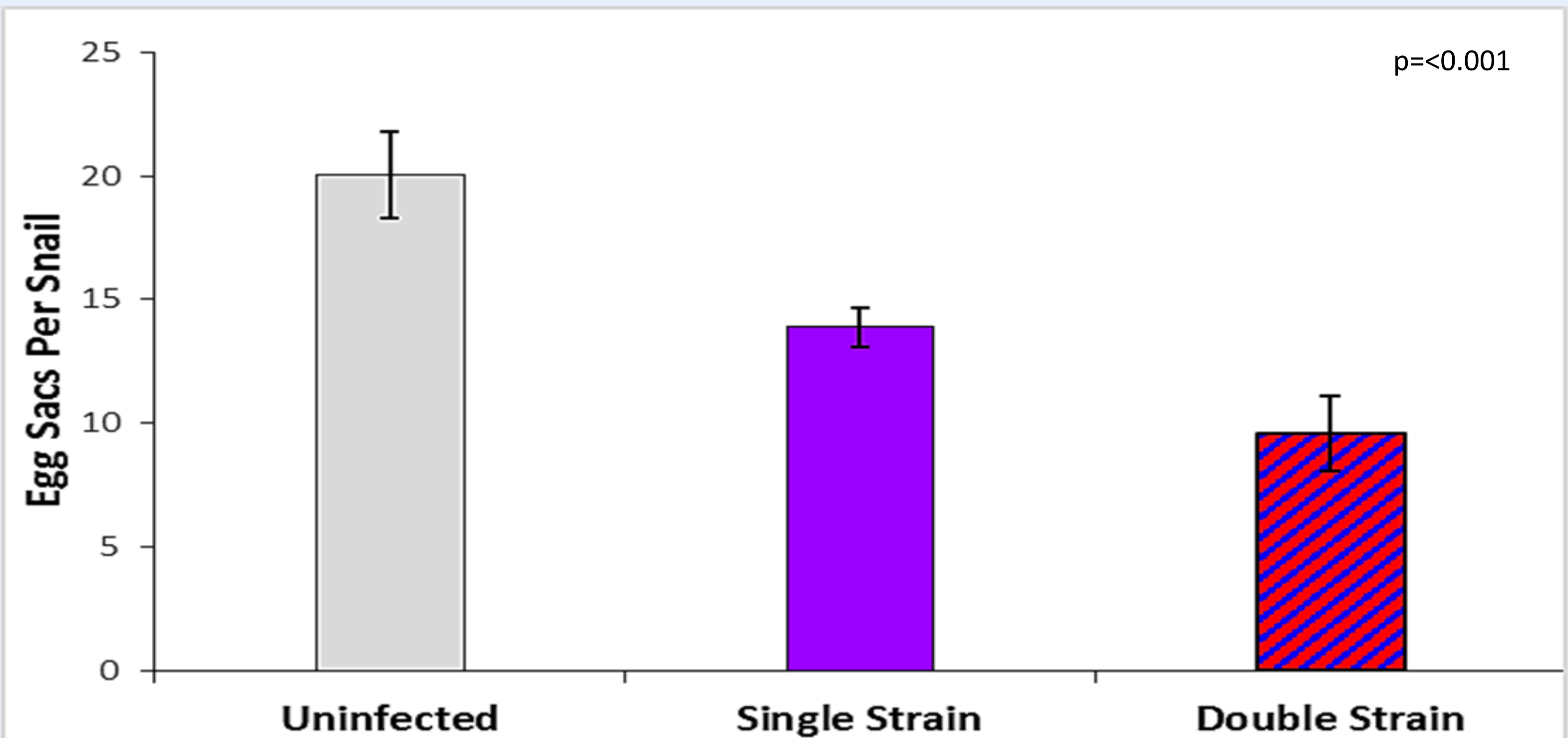


Fig. 6: Double-strain infections resulted in lower egg sac deposition by the hosts compared to single-strain infections and uninfected snails. $p<0.001$

PARASITE REPRODUCTION PATTERN

- Schistosome reproduction underwent 4-week cycles regardless of strain infection composition

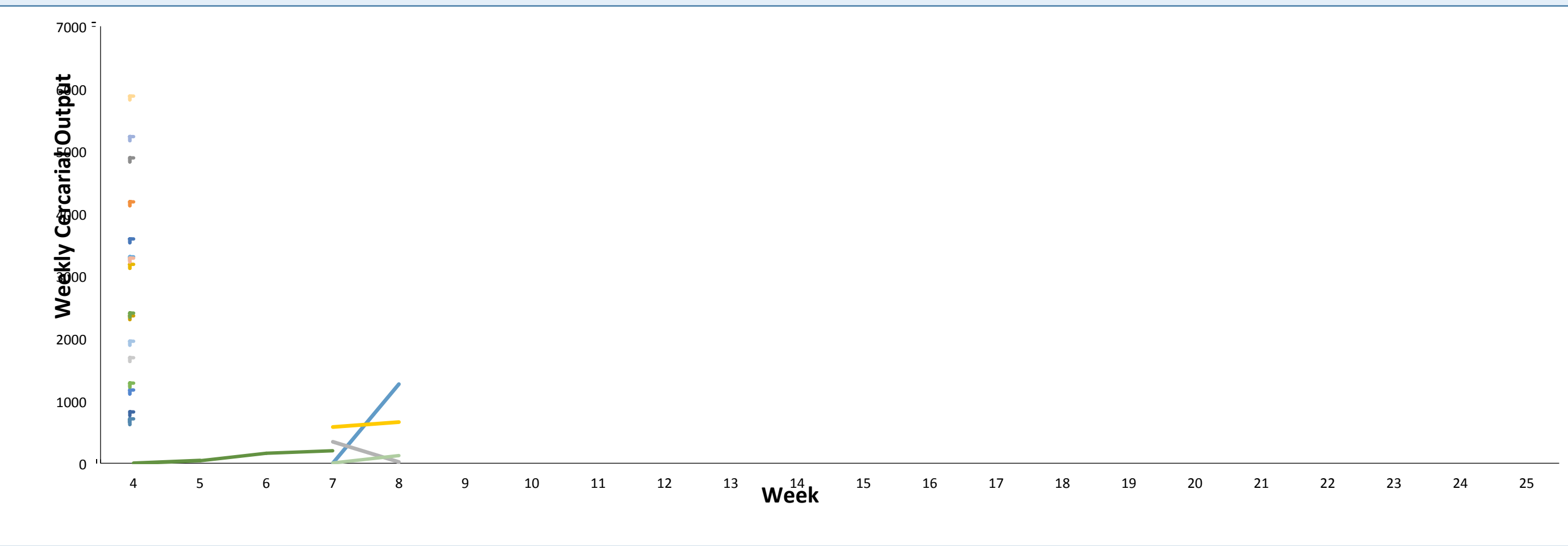


Fig. 7: Reproduction cycling in NMRI single-strain infected snails

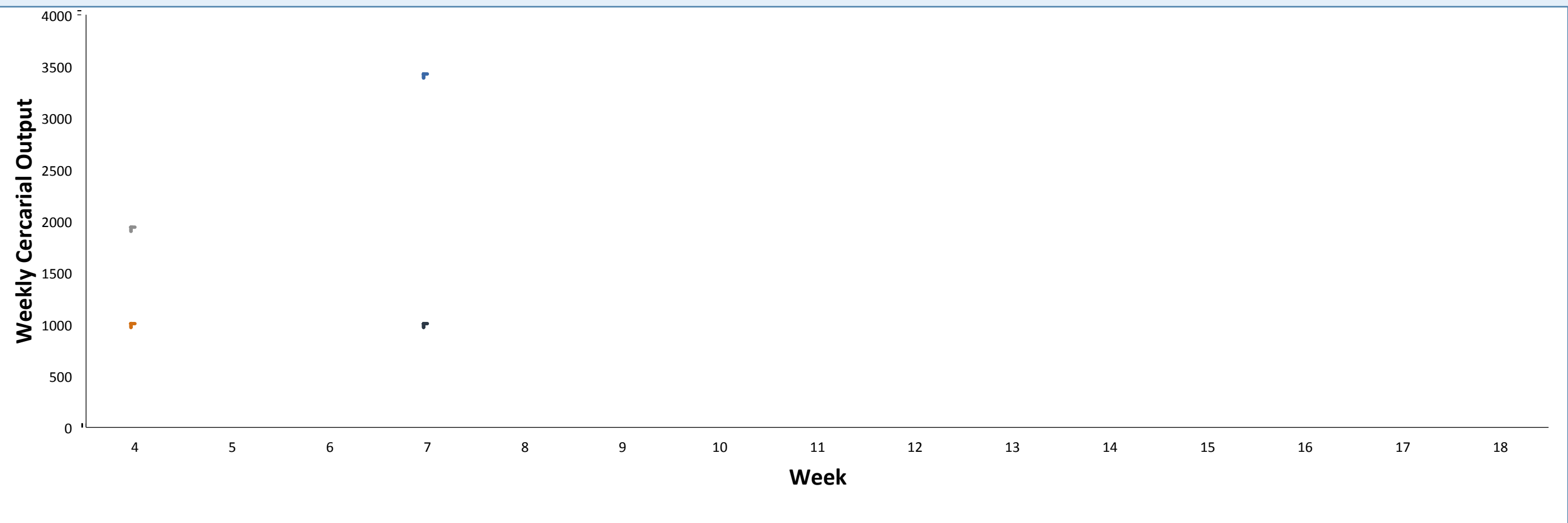


Fig. 8: Reproduction cycling in NM+PR double-strain infected snails

DISCUSSION

- Hosts that were co-infected laid fewer egg pouches, perhaps due to reduction in available nutrients.
- Cercarial output appears to go through four-week cycles. This means long-term studies are necessary to gain a full picture of infection.

FUTURE STUDIES

- Interactions between different strain combinations
- Effects of co-infection within the definitive host
- Potential mechanisms by which parasites interact.

Literature Cited

Parasites - Schistosomiasis." Centers for Disease Control and Prevention Centers for Disease Control and Prevention, Nov 2012 Web. 1 Apr 2014
Mitta G, et al. (2012) Compatibility polymorphism in snail/schistosome interactions: From field to theory to molecular mechanisms. Developmental and Comparative Immunology. 37: 1-8.

Acknowledgements

Thank you to all the help and guidance provided by Dr. Minchella, Alyssa Gleichsner and all the members of the Minchella lab group. Thank you to Purdue Biology Department for their support at every step along the way.