How much does innate immunity impact rodent malaria infection dynamics? A meta-analytic approach

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Plasmodium parasites are intraerythrocytic parasites that elicit various immune responses in their vertebrate host. Molecular and cellular studies point to various mechanisms of innate immune regulation. However, how much and to what extent, innate immunity impacts the rate of replication of these parasites within their host is not fully understood. Here, we applied a meta-analytic approach to quantify the effects of innate immunity against rodent malaria and identified covariates that affect the extent of immune control. We used four malaria species of rodent hosts as models because over 4 decades of primary research provides an opportunity for a rigorous quantitative synthesis. We found a small significant effect across different *Plasmodium* spp. (Cohen's h 0.15 – 0.42) meaning experimental manipulation of innate immunity has a small, yet consistently impact on malaria infection dynamics. Additionally, we explored the role of specific components in the innate immune system and various methodological approaches. We found that the type of manipulation (methodological approach) impacts the mean magnitude of innate immune interventions, and this could be helpful to design experiments because you could maximise the chances of observing even small differences. We also show that the pace at which innate immunity affects parasite growth is parasite-specific and covaries with functional innate immune components (receptors, regulators, and effectors). Finally, the direction in specific mechanisms in the literature reported effects to be beneficial or detrimental, similarly, we show no directionality in the effects. We conclude that in rodent *Plasmodium* spp. host innate immune components impact parasite early replication, but not all components have the same impact; for example, we could not detect a difference in magnitude between pro-inflammatory and anti-inflammatory interventions in P. *chabaudi*. Our findings could be combined with knowledge about disease severity to generate strategies that have the biggest impact on parasite growth with little immunopathological effects.