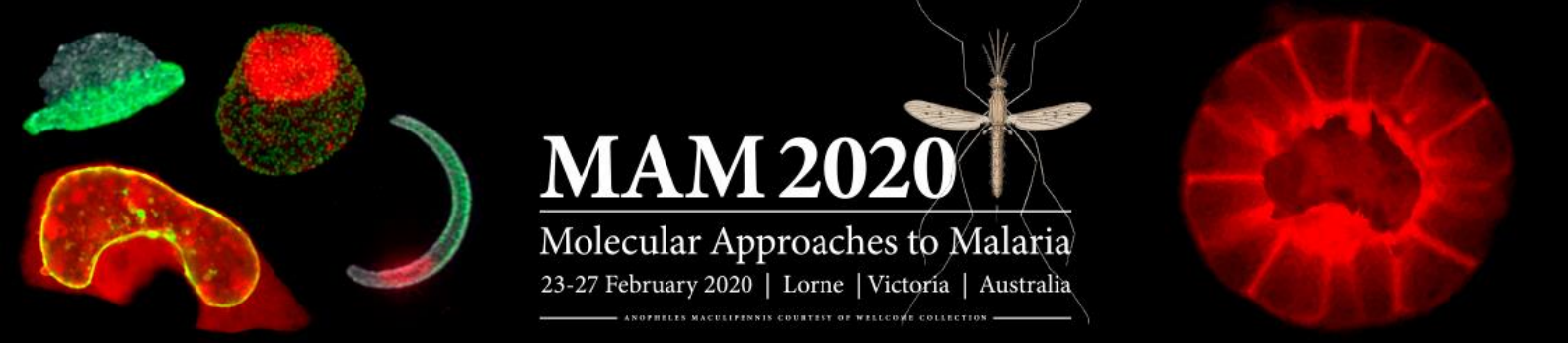

Report of the Molecular Approaches to Malaria Conference
23-27 February 2020, Lorne, Australia

I had the opportunity to attend the Molecular Approaches to Malaria Conference 2020 held in Lorne, Australia. This conference is organized every four years and with a particularly focus on the latest molecular research and technological advances in malaria research. With 5 workshops, almost 70 speakers and over 273 posters it was a packed, but very exciting program!

The talks covered a wide range of malaria research divided into the following themes:

- Host-parasite interactions
- Molecular Epidemiology
- Sex and Transmission
- Drug development
- Immunity and Vaccines
- Pre-Erythrocytic Biology
- Asexual Biology
- Genetics and Epigenetics
- Malaria Pathogenesis
- Drug resistance
- Frontier Technologies

Especially the talks in the sessions 'Sex and Transmission' and 'Immunity and Vaccines' were of great interest to me, since my PhD project focusses on the development of a vaccine that interrupts sexual parasite development and transmission. Talks highlighted novel insights into the mechanisms involved in sexual commitment of parasites and methods to identify genes involved in sexual development.

I also attended several workshops during the conference, I especially liked the workshop 'Job Interviewing in Industry'. The speaker is an employee at Merck and gave a lot of practical advice on how to set up your resume and prepare for an interview at a pharmaceutical company. It was a great way to get some more insights into the application process.

Furthermore, I had the opportunity to present my own research during one of the poster sessions. I had several interesting discussions and suggestions regarding the work I presented. It was very helpful and definitely things that I take along in my future research.

Besides the programme, there were several social events organised (e.g. welcome reception and conference diner) allowing to meet and talk with the other attendees (over 450). I enjoyed talking to other young scientists, discussing about science, future career plans and sightseeing spots in Australia.

This conference has allowed me to expand my knowledge on the broad scope of malaria research and more specially about my PhD project during my poster presentation. Furthermore, it was incredible to meet so many fellow scientists. I would like to thank the Dutch Society for Parasitology for awarding me this travel grant to attend this conference.

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Potency of transmission blocking monoclonal antibodies in field settings

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Interventions that inhibit malaria parasite transmission to mosquitoes are considered important tools to support elimination programs. The pre-fertilisation antigens Pfs48/45 and Pfs230 and post-fertilisation antigen Pfs25 have been the main focus of transmission blocking vaccine (TBV) development. Pfs25- and Pfs230- based vaccines have progressed to clinical testing and Pfs48/45 will follow in the near future. The success of these vaccines will not only depend on their ability to elicit high antibody titers, but also whether protective antibodies target conserved epitopes. Monoclonal antibodies (mAbs) can inform on required titers for protection and whether cross-strain protection is achieved. In this study, mAbs directed against Pfs48/45, Pfs230 and Pfs25 were compared for their efficacy in blocking transmission in the standard membrane feeding assay (SMFA) using cultured gametocytes and in direct membrane feeding assays (DMFA) using natural gametocyte donors. We found Pfs48/45 mAb45.1 and Pfs230 mAb2A2.2a to be highly potent; achieving near complete blocking of NF54 gametocytes in the SMFA at concentrations <5µg/mL, while 90µg/mL of Pfs25 mAb4B7 was required for achieving 90% reduction. DMFA data from natural gametocyte donors demonstrated that high transmission reducing activity could be achieved with mAb45.1 and 4B7, and IC_{50} values were comparable to SMFA. A remarkably different pattern was observed for mAb2A2.2a with clear variation is efficacy against gametocytes from different donors. A similar phenomenon was observed in the SMFA using gametocytes from lab-cultured isolates other than NF54. Strains could be classified as susceptible, moderately susceptible or resistant to this mAb. These observations were supported by variable binding of the mAb to Pfs230 on the gamete surface of these parasite lines. Genetic analysis of Pfs230 revealed non-synonymous mutations in resistant lines compared to susceptible lines that could explain the differences in efficacy of mAb2A2.2a in the SMFA and contribute to our understanding of the mAb binding site. The presence of these mutations in circulating parasites in the tested natural gametocyte donors and the developed oocysts in the DMFA are currently being determined. Overall, our data demonstrate that despite the general consensus that TBV targets are highly conserved, genetic variations may impact the efficacy of antibody-mediated interventions.