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Title: Generation of genetically attenuated blood-stage malaria parasites : characterizing growth and virulence in a rodent model of malaria

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Stellingen (Propositions)

Behorende bij het proefschrift

Generation of genetically attenuated blood-stage malaria parasites; characterizing growth and virulence in a rodent model of malaria

by Jingwen Lin

1. The observation made in this study that *P. berghei* parasites can survive without both plasmepsins and berghepains, indicates that the parasite can not only utilize overlapping enzymatic pathways but also alternative modes for survival (this thesis).
2. Our studies on hemoglobin catabolism using a rodent parasite that alter its red blood cell tropisms *in vivo*, challenge some assumptions derived from *P. falciparum* in culture and questions the supposition that examining *P. falciparum* directly is always the best way to understand human malaria (this thesis).
3. Even between cloned lines of the same *Plasmodium* (malaria) parasite, differences in virulence can exist (Amani V, *et al.* Infect Immun, 1998).
4. The strength of the novel GIMO transfection method developed in this study is that it not only improves transfection efficiency but also greatly reduces the number of laboratory animals required to select mutants (this thesis).
5. Despite the debate about the relevance of rodent models to study malaria pathology (Craig AG, *et al.* PLoS Pathog 8, 2012), these models still provide the most tractable and useful means of analysing host-parasite interactions *in vivo*.
6. Though some controversy exists about how well malaria pathology in rodents mimics that observed in humans, recent evidence indicates there are many similarities between malaria-associated acute respiratory distress syndrome (MA-ARDS) in humans and rodent models (Van den Steen PE, *et al.* Trends Parasitol, 2013).
7. While whole parasite vaccines are likely to be more expensive than sub-unit vaccines, they contain a greater spectrum of correctly folded parasite proteins, which ultimately may be critical for inducing sustained protective immunity.
8. In order to realise a vaccine against malaria, based on attenuated parasites, studies should not only aim to generate the best immunogen but also examine and improve the vaccination regime, including the best routes and sites of vaccine administration.

9. To re-interpret Donald Rumsfeld's quote (1932–): While we pursue known unknowns, occasionally uncovering unknown unknowns, it is also wise to question known knowns.
10. The best way to have a good idea is to have lots of ideas (Linus Pauling, 1901–1994).
11. A fall into the pit, a gain in your wit. Our greatest glory is not in never falling, but in getting up every time we do (Confucius, 551–479 BCE).
12. It doesn't matter if the cat is black or white as long as it catches mice (Deng Xiaoping, former president of China, 1904–1997).