

Table of Contents

Summary	I
Acknowledgements	V
Table of Contents	VI
List of Abbreviations	VIII
1. Introduction	1
1.1 Malaria	2
1.1.1 Global disease burden	2
1.1.2 <i>Plasmodium</i> spp. life cycle	2
1.1.3 Malaria clinical symptoms and treatment	3
1.1.4 <i>P. falciparum</i> immune evasion and host immune response	4
1.1.5 Vaccine development against malaria	7
1.2 RNA-Seq method for transcriptome analysis	10
1.2.1 Transcriptomics: definition and history	10
1.2.2 RNA-Seq workflow	11
1.2.3 RNA-Seq data analysis	11
1.2.4 Application of RNA-Seq in malaria vaccine research	12
1.3 Group B <i>Streptococcus</i> / <i>Streptococcus agalactiae</i>	14
1.3.1 GBS disease history	14
1.3.2 Global GBS disease burden	14
1.3.3 GBS diagnosis and treatment in pregnant women	15
1.3.4 GBS virulence factors	16
1.3.5 GBS global epidemiology	18
1.3.6 Vaccine Development against GBS	20
1.4 MALDI-TOF MS in clinical microbiology	23
1.4.1 Microbial species identification in clinical routine	23
1.4.2 Principle of MALDI-TOF MS technology	23
1.4.3 MALDI-TOF MS in microbiological diagnostics	25
1.4.4 Ribosomal subunit protein biomarkers	26
1.5 Aims of this thesis	28

2. Safety, Immunogenicity, and Protective Efficacy against Controlled Human Malaria Infection of <i>Plasmodium falciparum</i> Sporozoites Vaccine in Tanzanian Adults	29
3. Whole blood transcriptome changes following controlled human malaria infection in malaria pre-exposed volunteers correlate with parasite prepatent period	42
4. Subspecies typing of <i>Streptococcus agalactiae</i> based on ribosomal subunit protein mass variation by MALDI-TOF MS	61
5. Draft Genome Sequences of Seven <i>Streptococcus agalactiae</i> Strains isolated from <i>Camelus dromedarius</i> at the Horn of Africa	89
6. Tracing and monitoring of emerging Group B <i>Streptococcus</i> genotypes with zoonotic potential in Hong Kong	92
7. General Discussion	115
7.1 Evaluation of malaria vaccines in different populations using controlled human malaria infection: Chapters 2 and 3	117
7.2 MALDI-TOF MS as a phyloproteomic tool for post-vaccination monitoring of GBS genotype landscape and screening for emerging strains: Chapters 4, 5 and 6	123
8. Outlook	129
9. References	134
Appendix	148
A: Supplementary information for Chapter 4	
B: Matrix-assisted laser desorption/ionization time of flight mass spectrometry for comprehensive indexing of East African ixodid tick species	