

PROTEOMIC ANALYSIS OF ASEXUAL STAGES, YOUNG AND MATURE GAMETOCYTES OF *PLASMODIUM FALCIPARUM* STRAIN NF54 BY MASS SPECTROMETRY

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Abstract. *Plasmodium falciparum* has a complex life cycle within the human host and specialized proteins at each stage are required. A proteomic analysis and protein classification of asexual stages, young and mature gametocytes were conducted as a preliminary study towards a better understanding of the biology of this complex vector-borne parasite. *P. falciparum* strain NF54 was cultivated and asexual parasites, young gametocytes (Stages I-III) and mature gametocytes (Stages IV-V) were harvested on days 3, 8 and 13, respectively. Proteins expressed in each type of parasite preparation were separated by SDS-PAGE and identified by mass spectrometry. A total of 7,778 proteins were detected, of which 3,220 were exclusively in asexual stages, 463 from young gametocytes and 1,699 from mature gametocytes while 691 proteins were common to all three types of parasites. In order to obtain the functional characteristics of these parasite proteins, they were classified using a protein analysis through evolutionary relationships classification system (PANTHER). Receptor proteins were absent in young gametocyte while asexual stages had a five-fold higher content than mature gametocytes. Proteins with antioxidant activity in young gametocytes were five-fold more abundant than in both asexual parasites and mature gametocytes. Mature gametocyte showed a two-fold higher percent membrane-associated proteins than the other two parasite types. The data obtain from this study should be of use in more detailed investigations of proteins expressed in the various parasite stages, which could lead to discoveries of novel antimalarials and development of more effective vaccines.

Keywords: *Plasmodium falciparum*, asexual stage, gametocyte, mass spectrometry, proteome

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