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MORN1 - a moonlighting protein with a possible role in the nuclear division cycles of *Plasmodium falciparum*

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Due to increasing drug resistance of *Plasmodium falciparum*, a search for novel drug targets is of great importance. The nuclear division cycles of the malaria parasite are of particular interest, since they differ from traditional mitosis in several aspects. Thus, gaining deeper insights into parasite mitosis, its underlying dynamics and the involved proteins may reveal an entire array of novel targets. In this respect, the membrane occupation and recognition nexus protein 1 (MORN1), which is conserved among Apicomplexa, may be a promising candidate. In *Toxoplasma gondii*, MORN1 is associated with the spindle poles and the inner membrane complex (IMC). Overexpression of *Tg*MORN1 results in serious defects in nuclear segregation. In *P. falciparum*, MORN1 has been found to be solely expressed in schizonts suggesting a function during mitosis [1]. To further elucidate MORN1 function during the cell cycle, affinity purified anti-*Pf*MORN1-antibodies were used for stage specific Western blot and indirect immunofluorescence analysis. Western blot analysis is based on an antibody-based detection of the protein band of interest and its final identification in an enzymatic reaction that produces a chemiluminescent signal. The indirect immunofluorescence analysis employs the use of target-specific antibodies as first antibody. Binding to the target is then detected with a second antibody carrying a fluorophore. These two optical technologies were used to shed light on MORN1 function in *P. falciparum*. The anti-*Pf*MORN1-antibody detected a single band of the expected size of 41.4 kDa. As reported by Ferguson et al., 2008, highest *Pf*MORN1 amounts were found in mature parasites, the so-called schizonts and segmenters, consistent with its function in mitosis and its association with the IMC. However, contrary to previous studies *Pf*MORN1 expression was also found in young parasites, so-called rings, which could be confirmed with a second anti-*Pf*MORN1-antibody. The Western blot results are in good agreement with the microscopic examination. Segmenter stages showed a pattern that is characteristic for an association with the IMC of merozoites. In rings, however, MORN1-structures are located terminally at the crescent shaped DNA suggesting that MORN1 may not only be crucial for the nuclear division, but may also be required in the earlier development of *P. falciparum,* making it even more suited as potential drug target.

[1] D. Ferguson et al., *Eukaryotic Cell* **7**(4), 698-711 (2008)