Immunolocalization and functional characterization of PFE1445C: a novel integrin alpha-like cell adhesion protein in *Plasmodium falciparum*

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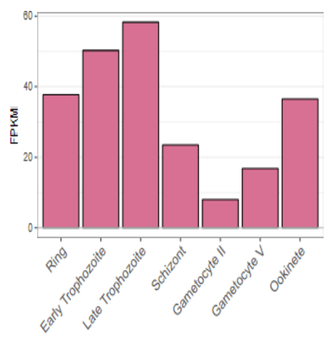
Background

Plasmodium cytoadherence is an important immune evasion strategy that ensures the development and expansion of malaria parasites in human host. The cytoadherence/sequestration process of Plasmodium parasites is organ selective, and thought to be mediated by a combination of specific ligands and receptors that are located in trans on both the parasite (or infected erythrocyte surface) and associated host cell surface membranes. Whereas the cytoadherence protein, PfEMP-1 had been identified as the most important ligand for mature asexual stage parasite cytoadherence to microvasculature endothelia, the protein ligands responsible for sexual stage sequestration in collagen-rich bone marrow tissues have remained unknown.

Objective: To determine the subcellular localization and immunological characteristics of a novel *Plasmodium falciparum* integrin-like protein with potentials to mediate both asexual and sexual stage parasite sequestration in collagen-rich tissues.

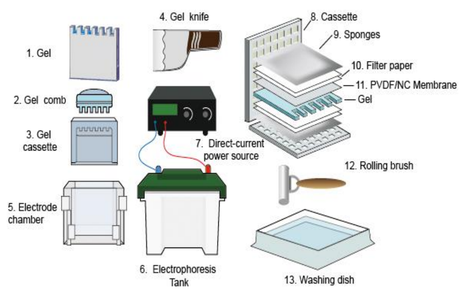
Materials and Methods

A- Identification of Pfintegrin by structural classification of proteins (SCOP).

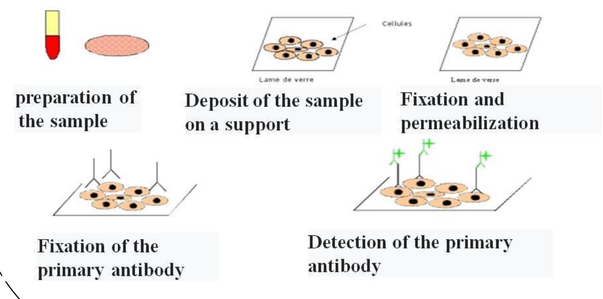


Transcript expression profile of PFE1445C

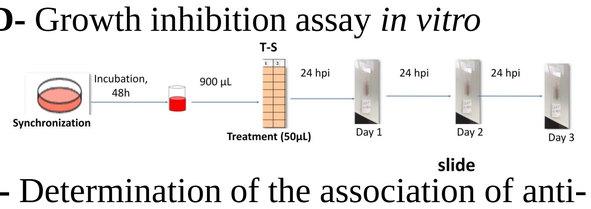
B- Western immunoblot analyses.



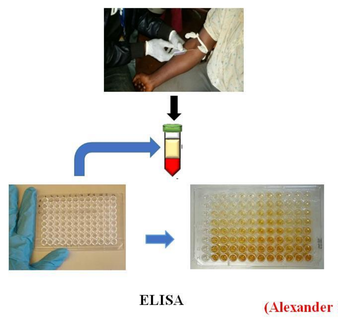
C- Fluorescence microscopy examination of the protein in fixed cells.



D- Growth inhibition assay *in vitro*



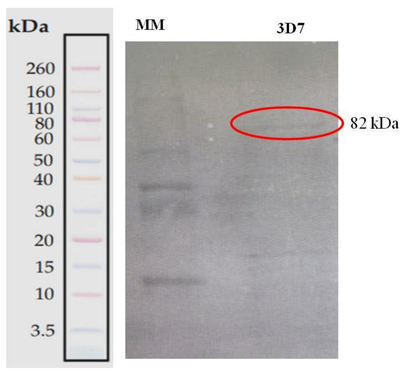
E- Determination of the association of anti-PfINT antibody carriage with protection against malaria.



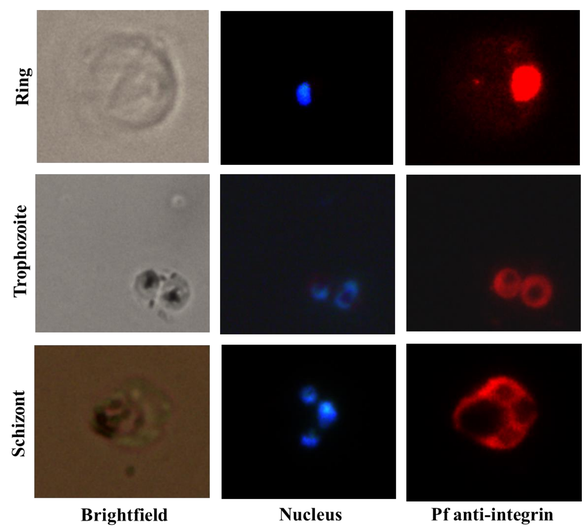
(Alexander Boes *et al.*, 2015)

Results and discussion

A. Expression and membrane-association of PFE1445C

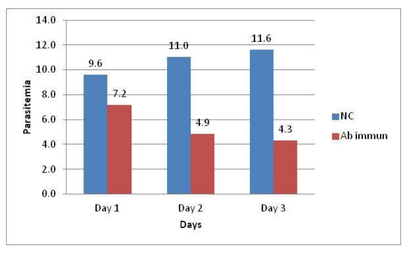


Recognition of 82 kDa Pf 3D7 protein by anti-Pfintegrin peptide antibody

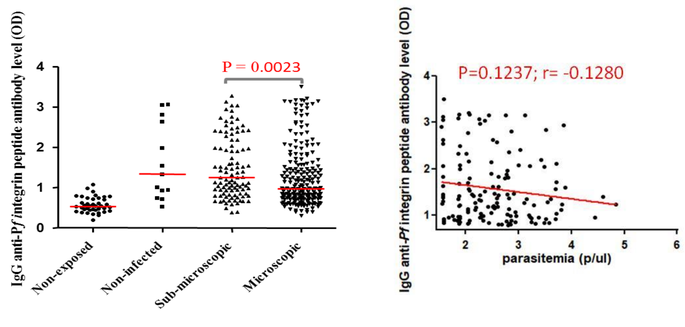


Association of Pfintegrin alpha-like protein with intra-erythrocytic membrane structures

B. Functional characterization of anti-Pfintegrin antibody responses



Growth inhibitory effects on *P. falciparum* 3D7 in vitro



Inverse association between anti-Pfintegrin antibody levels and blood parasite density

Conclusion

- **Together, our data suggest a role for PFE1445C in asexual development of *P. falciparum* both in vitro and in vivo in humans. Our ongoing studies will define the role of PFE1445C in the pathogenic processes of malaria parasites.**

References

- Alexander Boes *et al.*, 2015. Analysis of a Multi-component Multi-stage Malaria Vaccine Candidate—Tackling the Cocktail Challenge
- Myungeun et al. (2016). Antiviral research
- WHO, (2018). Wold Malaria Report

Acknowledgement

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