The distinct proteome of placental malaria parasites

MichalFried[ab] Kim K.Hixson[c] LoriAnderson[a] YukoOgata[a] Theonest K.Mutabingwa[ad] Patrick E.Duffy[ab]

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Abstract

Malaria proteins expressed on the surface of *Plasmodium falciparum* infected erythrocytes (IE) mediate adhesion and are targeted by protective immune responses. During pregnancy, IE sequester in the placenta. Placental IE bind to the molecule chondroitin sulfate A (CSA) and preferentially transcribe the gene that encodes VAR2CSA, a member of the PfEMP1 variant surface antigen family. Over successive pregnancies women develop specific immunity to CSA-binding IE and antibodies to VAR2CSA. We used tandem mass spectrometry together with accurate mass and time tag technology to study IE membrane fractions of placental parasites. VAR2CSA peptides were detected in placental IE and in IE from children, but the MC variant of VAR2CSA was specifically associated with placental IE. We identified six conserved hypothetical proteins with putative TM or signal peptides that were exclusively expressed by the placental IE, and 11 such proteins that were significantly more abundant in placental IE. One of these hypothetical proteins, PFI1785w, is a 42 kDa molecule detected by Western blot in parasites infecting pregnant women but not those infecting children.

Keywords

Placental malaria *Plasmodium falciparum* Membrane-associated proteins Comparative proteomic