ABSTRACT

Highly synchronous cultures of the erythrocyte stages of *Plasmodium falciparum*, K1 strain, were used to determine the effects of a number of protease inhibitors and red cell membrane glycoporphin A preparation on parasite development and merozoite invasion. Glycophorin A, at a concentration of 1 mg/ml, had no effect on parasite development but inhibited merozoite invasion by 66%. The protease inhibitors, N-tosyl-L-lysyl chloromethylketone (TLCK), leupeptin and pepstatin A at a concentration of 0.25 mM, 0.05 mM, 0.075 mM respectively were both deleterious to parasite development and inhibited merozoite invasion. On the other hand, N-tosyl-L-phenylalanyl chloromethylketone (TPCK) and phenylmethylsulfonylfluoride (PMSF) at a concentration of 1 mM and chymostatin at a concentration of 0.15 mM did not affect parasite growth but inhibited merozoite invasion. Pretreatment of erythrocytes with 1 mM of TPCK, TLCK and PMSF did not block invasion. These results suggested that a protease activity of the merozoite is important in the invasion process. An alternative, although less likely, explanation is that the protease is involved in merozoite liberation from schizonts.
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