ABSTRACT

Highly synchronous cultures of the erythrocyte stages of Plasmodium falciparum, K_1 strain, were used to detemine the effects of a number of protease inhibitors and red cell membrane glycophorin 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 0.25mM, 0.05mM, 0.075mM 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 immportant in the invasion process. An alternative, although less likely, explantion is that the protease is involved in merozoite liberation from schizonts.

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