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RELATIONSHIP OF PHOSPHORYLATION OF MEMBRANE PROTEINS WITH
MEMBRANE PROPERTIES OF MALARIA - INFECTED ERYTHROCYTES

BY

TEM DUANG LIMPAIBOON (B.Sc. Hons. in Med. Tech.)

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จาก

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Abstract

Incubation of isolated membranes of Plasmodium berghei-infected erythrocytes with (γ - ^{32}P) ATP, or of intact cells with $^{32}\text{P}_i$, results in phosphorylation of actin and other membrane proteins. The level of phosphorylation was dependent on the stage of parasite maturation. In moderately hypotonic buffer, the levels of phosphorylation of actin and other minor proteins of unlysed cells were higher than those of lysed cells. It was found that schizont stage infected erythrocytes were prone to lysis and had lower phosphorylation. The difference in phosphorylation was not due to difference in rates of dephosphorylation. Microscopic examination of parasitized erythrocytes just before lysis from treatment with 150 mOsm and 100 mOsm buffers showed that the diameters were similar, indicating similar surface areas.

Infected erythrocytes were subjected to repeated filtrations through 3 μ micropore filters. The degree of phosphorylation of actin and other minor proteins in the filtered cells was higher than that of original cells, corrected for difference in parasitaemia and stage distribution. Infected erythrocytes loaded with Ca^{2+} through the ionophore A23187 showed a sharp decrease in phosphorylation of membrane proteins. The increase in intracellular Ca^{2+} , which occurs naturally at the schizont stage, could play a role in changing membrane properties through its effect on phosphorylation as well as through other mechanisms. There was no phosphorylation

of actin in P. chabaudi (AS and Pr₁) and P. falciparum (K₁) infected erythrocytes. In contrast, there was phosphorylation of actin in P. yoelii YM and 33X. It is concluded that there is a heterogeneity in the phosphorylation patterns, and high phosphorylation of actin and possibly other minor proteins, is correlated with membrane stability and deformability, specially required for erythrocytes with larger parasites.

