The effect of antimalarial drugs, chloroquine, primaquine and quinine on DNA synthesis in human bone marrow cells was studied. The studies were carried out both in vivo and in vitro. Human bone marrow cells were obtained from eight normal subjects and three malarial infected persons at Pramongkut Hospital, Bangkok. The tissues were incubated with CH$_3$-$^3$H thymidine (0.01 µmole) and $^{14}$C-formate (9.98 µmole) in the presence of various antimalarial drugs in order to determine the step at which the DNA synthesis was inhibited by the three drugs as compared to control.

A marked decrease in the incorporation of CH$_3$-$^3$H thymidine was observed in vitro in the bone marrow cells obtained from normal subjects and from malaria infected patients. The significant decrease in the synthesis of DNA-thymine from $^{14}$C-formate in vitro was noted before but not after 1500 mg of chloroquine administration. No effect of these drugs on the mono carbon pool was observed both in vitro and in vivo. Hemoglobin concentration and hematocrit value of normal subjects did not change during the experimental period. There was a slight increase in hemoglobin concentration of malaria infected patients but it was still lower than normal; only one out of two showed an increase in hematocrit value after chloroquine administration.
The inhibition of DNA synthesis as observed in vitro may indicate that their mode of inhibition depends upon the intracellular concentration of the drug. The \textit{in vivo} concentration of chloroquine was reported to be $10^{-6}\text{M}$ (40), which was very low compared to $10^{-3}\text{M}$ concentration of the drug added in experiments.

The inhibition of DNA synthesis was thought to be at the replication step. DNA primer could not serve as a template as a result of complex formation with the drugs. This result is in good agreement with those reported earlier (12).