Malaria Vaccines

Thomas H. Maugh's article on malaria (Research News, 22 Apr., p. 413) is an excellent and timely summary. However, there is a significant omission concerning the development of potential human malaria vaccines.

Under the sponsorship of the Agency for International Development, we have been working to establish the feasibility of malaria vaccination and antigen production. The work was begun at the University of Illinois in 1966 and transferred to the University of New Mexico in 1972.

We have shown that a lyophilized preparation from the erythrocytic stages of the malarial organism can effectively immunize rhesus monkeys against the highly virulent simian malaria, *Plasmodium knowlesi* (*1*). The vaccine has been partially purified by column chromatography and characterized both biochemically (*2*) and ultrastructurally (*3*). It can be stored for long periods of time and, in a recent comparative test, a 6-month-old freeze-dried preparation was more effective than a freshly prepared merozoite vaccine (*4*). We have also shown that our vaccine can stimulate a protective effect for up to 4 years after immunization, even when the vaccinated monkey is challenged with heterologous strains (*5*).

In addition, we have demonstrated that Freund's complete adjuvant can be replaced with a combination of a vegetable oil (adjuvant 65) mixed with bacillus Calmette-Guérin (*6*). These components are acceptable for human use.

Clarence Speer, formerly of our group and now at the University of Montana, has also demonstrated the possibility of culturing the erythrocytic stages of the malarial organism in cultured nucleated cells in vitro (*7*). This method introduces the possibility of developing a continuous culture system free of hemoglobin and of any viral contaminants associated with the continuous addition of fresh human red cells, as would be the case in the Trager-Jensen system.

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