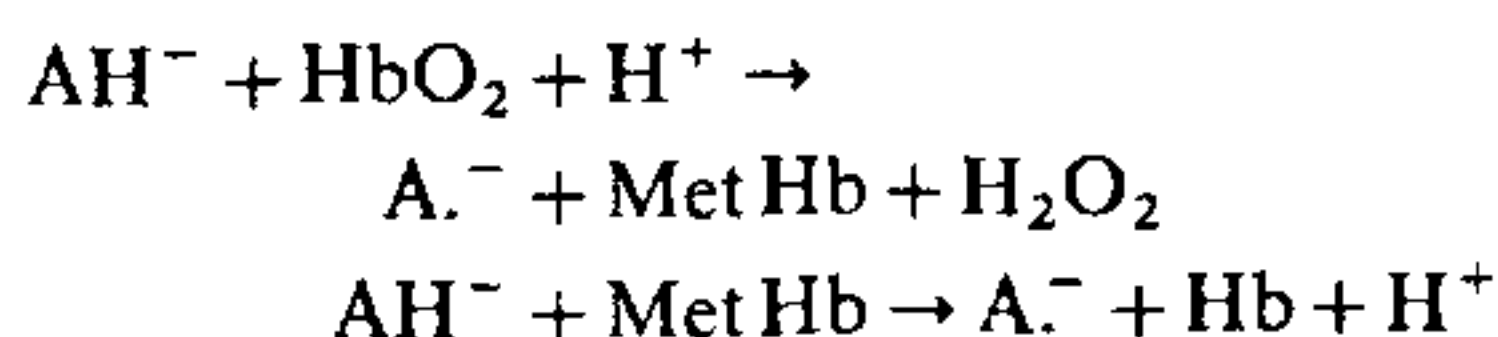


tocopherol is shown to have a similar property of inducing an equilibrium of 20% oxyhemoglobin and 80% methemoglobin when incubated with cells containing different amounts of methemoglobin initially. However with cells containing 100% oxyhemoglobin  $\alpha$ -tocopherol induced only about 6% of methemoglobin formation. Glucose and NADPH<sub>2</sub> generating system in all the incubations, favoured formation of more HbO<sub>2</sub> than with  $\alpha$ -tocopherol or ascorbate alone. It is significant that the effect of  $\alpha$ -tocopherol is evident at a concentration of 0.04  $\mu$ M which is of the order of  $\alpha$ -tocopherol present in normal humans<sup>10</sup> while the effect of ascorbate has been shown to be negligible at the physiological concentration (0.1 mM).

The role of ascorbate at levels higher than physiological concentration in maintaining 75% oxyhemoglobin and 25% methemoglobin has been explained by the coupled oxidation of ascorbate and hemoglobin, by Spiegel *et al*<sup>11</sup> by the following 2 reactions:



Ascorbic acid is impermeable to red cells while dehydroascorbate is capable of entering the cell<sup>6</sup> and therefore it was postulated that within the cells dehydroascorbate is converted to ascorbate through the action of the reduced glutathione which in turn is maintained by NADPH. The function of  $\alpha$ -tocopherol in shifting the equilibrium from methemoglobin to oxyhemoglobin (table 2) may be through maintaining the ascorbate level by preventing its oxidation to dehydroascorbate within the cell. The finding that  $\alpha$ -tocopherol synergises the effect of ascorbate in the above system confirms the above postulate. The synergistic effect of glucose may be explained as due to its stimulating effect on the hexose monophosphate shunt

leading to higher rate of production of NADPH and a steady level of GSH. This is supported by the observation that the presence of NADPH in the system also synergised the effect of  $\alpha$ -tocopherol and the simultaneous presence of glucose, ascorbate NADPH and  $\alpha$ -tocopherol resulted in the conversion of 99% methemoglobin to oxyhemoglobin.

The results of our present study would therefore indicate that at the physiological level of  $\alpha$ -tocopherol in blood it has a significant role for maintaining the oxyhemoglobin concentration with in the erythrocytes.

3 February 1984; Revised 26 March 1984

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## ANNOUNCEMENT

### AMRUT MODI RESEARCH AWARD FOR DR. DILBAGH RAI SRIDHAR

Dr Dilbagh Rai Sridhar, General Manager (R&D) IDPL Research Centre, Hyderabad has been selected for the Twelfth Annual Amrut Modi Research Award for the year 1981 for his outstanding contributions in

the field of Pharmacy and Pharmaceutics. Dr Sridhar shares this award with Dr (Mrs.) M. R. Daichwal of C. U. Shah College of Pharmacy, Bombay. The award carries a cash prize of Rs. 10,000 and citation.