LETTER

DEPRESSION OF THE SERUM ACID PHOSPHATASE ACTIVITY
BY A HUMAN SALIVA EXTRACT IN RABBITS

To the Editors

In the course of studies on human salivary proteins, we found that a human saliva extract depressed the serum acid phosphatase activity in rabbits. The human saliva extract was prepared from human mixed saliva by the acetic acid extraction method which had been used for preparation of the partially purified fraction of saliva-parotin-A (abbr. SPA) (Ito and Okabe, 1959; Okabe, 1959). The extract migrated as a single peak in Tiselius free electrophoresis. Six distinct and three faint protein bands were, however, detected on an electrophoretic pattern of the extract when it was submitted to cellulose acetate paper electrophoresis. Female rabbits weighing 2.5-3.5kg were used for bioassay after fasting for 24 hrs. The extract was dissolved in physiological saline to concentrations of 100, 50, 1 and 0.1μg per 0.1ml. The solutions were each given to the animals at a dose of 0.1ml/kg by a single intravenous injection. The same volume of physiological saline was injected to the control animals. Blood samples were collected from the marginal ear vein 2, 4, 5.5, 7 and 10 hrs. after the injection. Since this fraction had been shown to produce hypocalcemia and leukocytosis in rabbits (Ito and Okabe, 1959), the present preparation was assayed also for these two activities by the method of Ito (1960). The serum acid phosphatase activity was measured according to the method described by Linhardt and Walter (1963) using sodium p-nitrophenylphosphate as the substrate.

The effects of the extract on the serum calcium level and the number of the circulating leukocytes at 100μg/kg are shown in Figures 1 and 2, respectively. The leukocytosis was preceded by transient but distinct leukopenia which was characteristic for the purified SPA (Okabe, 1959). This result indicates that the extract contained SPA. The effect of the extract on the serum acid phosphatase activity at 100μg/kg is illustrated in Figure 3. The enzyme activity was depressed by the average value of 23.7%, 5.5 hrs. after the injection. This depression was statistically significant (P<0.01) when compared to the control values. Although the average value of the depression (25.7%) obtained after 7 hrs. was higher than that after 5.5 hrs., the former was not statistically significant due to scattering of the observed values. After 10 hrs., the enzyme activity returned to the normal value. Weaker but definite depression of the serum acid phosphatase activity was caused by the extract at doses of 50 and even 1μg/kg. At 0.1μg/kg, however, the ex-

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The extract produced no change in the enzyme activity. The serum alkaline phosphatase activity was measured at the same time, but, in the present experiment, no significant difference was observed between the control and the treated due probably to the scattered values.

The physiological significance of the serum acid phosphatase depressing action of the human saliva extract is not clear at the present stage. It also remained to be determined whether this action is attributable to SPA or to another unknown substance, since the extract was only in a partially purified form and contained SPA. The possibility that the depression of the serum acid phosphatase activity might be produced by small molecular inorganic or organic compounds was excluded in the present experiment, since such small molecular substances had already been removed from the extract by dialysis during the purification procedure. Further work is now in progress to clarify the biological action and chemical properties of this principle.

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REFERENCES