SPECIAL TECHNICAL REPORT

from

THE KOGOFF MEDICAL RESEARCH INSTITUTE
BEILINSON HOSPITAL, PETAH TIKVA, ISRAEL

on

INVESTIGATIONS ON THE ANTIGENICITY OF SNAKE VENOMS

submitted by

Dr. Natan Goldblum, Hebrew University-Hadassah Medical School,
Jerusalem

CONTRACT NUMBER: DA-91-591-EUC-3789

for the period

October 1, 1965 to December 31, 1965

The research reported in this document has been made possible through the support and sponsorship of the US Department of Army, through its European Research Office. This report, not necessarily in final form, is intended only for the internal management use of the Contractor and the US Department of Army.

In the Annual Report for the First Year of Study we have reported on our attempts to produce a potent antivenin against V. palestinae venom in horses. At that time our attempts were not very successful and the horse antiserum was of very poor antibody titer. Continued immunization of horses with whole Vipera palestinae venom, using large amounts of venom, were found ineffective for up to a period of 17 months. The neutralizing capacity of 1 ml serum did not exceed 10 LD_{50} of whole venom; this was mainly against the hemorrhagic fraction and no neutralization of the neurotoxic fraction whatsoever was obtained.

At that time, a major change was introduced in the immunization procedure through the use of venom-adjuvant mixtures. A single injection of a venom-adjuvant mixture (containing 100 mgm of venom) resulted in a considerable rise in the neutralizing capacity of the serum against whole venom (110 LD_{50}/ml) and "hemorrhagin" (130 LD_{50}/ml). This enhancement of the immunogenicity of Vipera palestinae venom by using a venom-adjuvant mixture was similar to that found previously for the hemorrhagic Echis colorata venom (see: Quarterly Technical Status Report No. 1).

In cintradistinction to the marked rise in anti-whole venom and anti-hemorrhagin titers, the venom-adjuvant mixture, although containing a considerable amount of neurotoxin, induced little or no antineurotoxic antibodies. Evidently, as pointed out previously, the neurotoxin molecule is of low immunogenic potency, presumably due to its low molecular weight (mw = 12,000). However, when 10 mgm of carboxy-methyl-cellulose (CMC) - bound neurotoxin were administered, a marked rise in antineurotoxin titer was obtained, reaching a value of neutralizing capacity of

50 LD_{50}/ ml serum 10 days after the injection. It is noteworthy, that whereas this rise in antineurotoxic potency of the serum was reflected in a parallel rise of neutralizing capacity against whole venom, no increase in antihemorrhagin titer was observed. This result obtained in horses illustrates well the previously reported enhancing effect of binding the neurotoxin to CMC on its immunogenicity, first demonstrated by us in rabbits. It is intended to follow the antivenin titers, both antihemorrhagic and antineurotoxic, during the next few months and accordingly administer booster injections.