

# **HALF YEAR MANAGEMENT REPORT (2)**

**Submitted to the**

**U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT CDR**

**(USAID CDR PROPOSAL TA-MOU-00-CA20-013)**

**"VACCINE AGAINST BOVINE BABESIOSIS IN CENTRAL  
ASIA"**

**COVERING THE PERIOD FROM**

**JANUARY TO JUNE 2003**

**SUBMITTED BY:**

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**And**

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**PROJECT DURATION: JANUARY 2002 – JANUARY 2005**

## 1. SCIENTIFIC SUMMARY

Babesiosis is a tick-borne, hemoprotozoan disease that affects domestic and wild animals, as well as humans; it occurs worldwide. Animals that survive natural field infection with *B. bigemina* and *B. bovis* are protected against clinical disease. An effective vaccination against bovine babesiosis is based on immunization of cattle with attenuated live parasites, and it results in the development of solid protective immunity. The overall objective of the proposal was to develop an attenuated live vaccine against babesiosis in cattle, that contains autochthonous strains from Uzbekistan. We have isolated *B. bigemina* and *B. bovis* from chronically infected cattle and from infected ticks. The last half-year was devoted to the attenuation of *B. bigemina* and examining the virulence by periodical inoculation of susceptible calves at various stages of attenuation. *B. bigemina* was successfully grown and propagated by successive passages in a cell culture (MASP) system, to obtain a population of attenuated parasites *in vitro*.

## 2. SCIENTIFIC ISSUES

*B. bigemina* isolated from chronically infected cattle as well as from infected ticks were subjected to attenuation by "slow passages" in calves. After the 4<sup>th</sup> passage of the tick-derived strain (BgTD-Uz) a small portion of experimental vaccine was prepared. Four 6-month-old calves were inoculated with the frozen vaccine, of which each dose contained  $2 \times 10^8$  infected erythrocytes. All animals responded with mild to low clinical signs of *B. bigemina* babesiosis. About 3-4 months after immunization, the calves will be challenged with the homologous virulent Uzbeki strain. Blood was transferred to an additional calf for the 5<sup>th</sup> passage to ensure maintenance of the strain. The blood-derived strain (BgBD-Uz) was frozen as a stabilate at passage 3: virulence of the parasites has not yet been assessed.

In culture, *B. bigemina* were propagated up to passage 10 and frozen with 10% PVP (polyvinyl pyrrolidone). Frozen cultures were transferred to Uzbekistan to be used in introducing the MASP technology at the Institute of Zoology.

### 3. MANAGERIAL ISSUES

**The Department of Finance will submit the detailed account of disbursement of funds allocated for the reporting period.**

#### **The Institute of Zoology (Uzbekistan):**

During the last reporting period three consignments of equipment, materials and chemicals were sent to Uzbekistan. The total value of the content of the three consignments was \$10,150. This sum does not include air transportation and insurance of goods. The equipment included: a pH meter, a balance, a FAX machine, a hematocrit centrifuge and a vacuum pump. I would like to mention that the fluorescence microscope was withheld by the Uzbeki customs for **7 months (!!!)**. The 3 consignments were kept for 2 months. A sum of \$1000 was transferred to the Institute of Zoology to cover salary and domestic travel expenses for the half-year.

#### **Kimron Veterinary Institute (Israel):**

In September 2003 two scientists spent two weeks working at the Institute of Zoology on the MASP culture of *B. bigemina*, and the collection of blood and serum samples from two farms in a region where babesiosis is endemic.

### 4. SPECIAL CONCERNS

No comments

### 5. COLLABORATION, TRAVEL, TRAINING

The Israeli PI, Dr. Varda Shkap and Mrs. Lea Fish, who is the expert in *in vitro* cultivation of Babesia parasites spent 2 weeks with the personnel of the Protozoology Laboratory at the Institute of Zoology in Tashkent. The frozen stabilate of the Uzbeki *B. bigemina* strain was retrieved, and *in vitro* cultivation was attempted under the

laboratory conditions of the Tashkent laboratory. Collection of blood samples for light microscopy, serology and PCR testing were performed, together with Prof. Rasulov, and a young veterinarian, Shavkat Abdulrasulov, who is in the final stages of his studies for PhD, **and has replaced Dr. Pak Den Sun.**

*V. Shkap*

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