BIOTIN-LABELED ANTIGEN SANDWICH ENZYME-LINKED IMMUNOSORBENT ASSAY (BLA-S-ELISA) FOR DETECTION OF HEMORRHAGIC FEVER WITH RENAL SYNDROME (HFRS) ANTIBODY IN HUMAN AND A VARIETY OF ANIMAL SERA

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Biotin-labeled antigen sandwich (BLA-S) ELISA was developed to detect hemorrhagic fever with renal syndrome (HFRS) antibody in sera from humans and a variety of animals, regardless of species- and class-specificities of immunogloblins. The assay was evaluated for its practicability in sero-epidemiological surveys. HFRS antibody was detected by being sandwiched between the antigens, and the avidin biotin system was employed to enhance sensitivity and specificity.

The results were summarized as follows:

1) BLA-S-ELISA could detect HFRS antibodies in the sera from HFRS infected humans and from all species of animals tested (rabbit, laboratory rat, urban rat, mouse, guinea pig, mongolian gerbil, *Apodemus (Ap.) agrarius, Clethrionomys (Cl.) rufocanus bedfordiae* and *Ap. argenteus)*. BLA-S-ELISA showed almost the same sensitivity as the immune adherence hemagglutination (IAHA) test. Antibody titers in the sera from normal animals were less than 1 : 5 in all species tested.

2) BLA-S-ELISA antibody titers were extremely low (less than 1 : 10) in the sera from urban rats from an HFRS non-endemic area. In the sera of urban rats from an endemic focus, antibody titers significantly correlated to each other between BLA-S-ELISA and IFA, and also between IAHA and ELISA. BLA-S-ELISA could detect a low level of antibody in the sera judged as negative by IFA, IAHA and ELISA.

3) Five species of animals (rat, mongolian gerbil, *Ap. agrarius, Cl. rufocanus bedfordiae* and *Ap. argenteus*) were experimentally infected with HFRS viruses (SR–11, TB–314, KI–262, H–76–118 and MP–40). All species of animals produced a high level of HFRS antibody against each strain.

4) Cross BLA-S-ELISA was performed using sera of rats infected with each of these HFRS virus strains. The 5 strains could be classified into 3 types depending on the species of host animals: *Rattus*-borne type (SR–11, TB–314 and KI–262), *Apodemus*-borne type (H-76-118) and *Microtus*-borne type (MP–40). Thus, BLA-S-ELISA was found to be a more strain-specific method than other serological diagnostic methods.