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ANTIGENIC ANALYSIS OF HEMORRHAGIC FEVER WITH RENAL SYNDROME  
(HFRS) VIRUSES AND SEROLOGICAL ASSAYS FOR HFRS VIRUS  
ANTIBODIES IN SERA FROM *RATTUS NORVEGICUS*

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Serological classification of hemorrhagic fever with renal syndrome (HFRS) viruses was made. In addition, several kinds of serological assays, enzyme-linked immunosorbent assay (ELISA), indirect fluorescent antibody (IFA) test, immune adherence hemagglutination (IAHA) test and neutralization (NT) test, were developed for the sera from rodents of *Rattus*.

The HFRS viruses used for antigenic analysis were 5 strains, which included SR-11, TB-314 and KI-262 strains (*Rattus norvegicus* origin, Japan), Hantaan-76-118 strain (H-76-118, *Apodemus agrarius coreae* origin, Korea) and Prospect Hill virus MP-40 strain (MP-40, *Microtus pennsylvanicus* origin, U. S. A.).

The results were summarized as follows :

- 1) In IFA and ELISA tests using immune sera prepared in rats against each strain, high cross-reactivities were observed among 3 *Rattus*-borne HFRS virus strains and *Apodemus*-borne virus strain.
- 2) In the IAHA test, one-way cross-reactivities were observed between *Rattus*-borne virus strain and *Apodemus*-borne virus strain.
- 3) In the NT test, no cross-reactivities were observed between virus strains from different host species (*Rattus*, *Apodemus* and *Microtus*). Thus, the 5 virus strains could be classified into 3 serotypes : *Rattus*-borne type, *Apodemus*-borne type and *Microtus*-borne type.
- 4) In the western blotting assay, major polypeptides of ca. 50 kilodaltons (K) and 57K were detected in the *Rattus*-borne virus strains, those of ca. 50K and 55K in the *Apodemus*-borne virus strain and ca. 40K, 58K and 62K in the *Microtus*-borne virus strain with each of the homologous antisera.
- 5) Four monoclonal antibodies against SR-11 strain were produced. In the cross IAHA test using these antibodies, one of the monoclonal antibodies had common reactivities against SR-11 and TB-314 strains, but none to KI-262 strain.
- 6) In the sera from 4 rats experimentally infected with SR-11 strain, ELISA-IgM antibody was first detected on the early days, by days 5 or 7, after virus inoculation, reached the peak titer by days 5 or 10 and faded away rapidly. ELISA-IgG antibody titer also appeared in the early stage, rose rapidly and was maintained at high titers. Neutralizing antibody was detected on the early days and increased gradually up to 7 weeks, the last time tested.