Virus Name: Sin Nombre		Abbreviation: SNV
Status **Probably not Arbovirus**	Select Agent **No**	SALS Level

SALS Basis

Other Information
DOC Permit Required

Antigenic Group
hantaan

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation	Accession Number	Original Date Submitted
		11/19/1993

Family	Genus
hantavirus	

Information From	Address
Peters, Ksiazek, Nichol, Childs, Rollin	**Special Pathogens Branch, DVRD, NCID, Centers for Disease Control, Atlanta, GA 30333**

Information Footnote

Section II - Original Source

Isolated By (name)	Isolated at Institute	
Elliot et al, (in preparation)	**Atlanta, Georgia**	
Host Genus **Peromyscus maniculatus**	Species	Host Age/Stage **adult**

Sex
Not Answered

Isolated From	Isolation Details
Organs/Tissues	**lungs**

Signs and Symptoms of Illness	Arthropod
none (PCR positive in tissues and antibody negative when sacrificed)	

Time Held Alive before Inoculation

Collection Method	Collection Date
trapped	**6/1/1993**

Place Collected (Minimum of City, State, Country)
Ramah, New Mexico

Latitude	Longitude
36° 10' N	**108° 28' W**

Macrohabitat	Microhabitat	Method of Storage until Inoculated
		-70dC

Footnotes

Section III - Method of Isolation

Inoculation Date
1/1/1993

Animal (Details will be in Section 6)
yes

Route Inoculated
intraperitoneal

Reisolation
Not tried

Other Reasons

Homologous Antibody Formation by Source Animal
Yes

Test(s) Used
IFA, ELISA

Footnotes

Section IV - Virus Properties

Physicochemical
RNA, Single Strand

Pieces (number of genome segments)
3

Infectivity

Sedimentation Coefficients(s) (S)

Percentage wt, of Virion Protein

Lipid

Carbohydrate

Virion Polypeptides: Number
4

Details
nucleoprotein (N) 50,000MW; glycoproteins (G1, G2); 55,000MW, 72,000MW; (L); 200,000MW

Non-virion Polypeptides: Number

Details

Virion Density

Sedimentation Coefficients(s) (S)

Nucleocapsid Density

Sedimentation Coefficients(s) (S)

Stability of Infectivity (effects)

pH (infective range)

Lipid Solvent (ether - % used to test)

After Treatment Titer

Control Titer

Lipid Solvent (chloroform)

After Treatment Titer

Control Titer

Lipid Solvent (deoxycholate)

After Treatment Titer

Control Titer

Other (formalin, radiation)

Virion Morphology

Shape
bunyavirus-like

Dimensions
80-115 nm

Mean
nm

Range
nm

Measurement Method
by electron microscopy

Surface Projections/Envelope
surface projections, lipid envelope

Nucleocapsid Dimensions, Symmetry

by electron microscopy | Surface projections, lipid envelope | Symmetry

Morphogenesis

Site of Constituent Formation in Cell	Site of Virion Assembly	Site of Virion Accumulation
Inclusion Bodies	Other	

Hemagglutination

Hemaggiutination **Not tried**	Antigen Source	Erythrocytes (species used)
pH Range	pH Optimum	
Temperature Range	Temperature Optimum	
Remarks		

Serologic Methods Recommended
IFA, ELISA *2: (a) Handling serum from potentia

Footnotes

Section V - Antigenic Relationship and Lack of Relationship to Other Viruses

Antigenically related to, but distinct from the other registered hantavirus, Prospect Hill, Hantaan, Puumala, Seoul. Data resulting from the serological comparison of Muerto Canyon virus to other registered hantaviruses, Prospect Hill, Hantaan, Puumala and Seoul is not available. However, nucleotide sequence characterization of the three RNA segments composing the viral genome showed that each segment was unique and that there was approximately 30% nucleotide sequence divergence from the respective segments of the closest relative, Prospect Hill virus [14] . Up to 10% nucleotide sequence variation was seen between hantavirus pulmonary syndrome (HPS) viruses from New Mexico, Arizona and Colorado, both from rodents and from human autopsy tissues. Even greater variation (up to 14%) was observed when the analysis included viruses from other regions [14] .

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)
tissues of vertebrates (mainly lungs, spleen, kidney)

Lab Methods of Virus Recovery (ALL ISOLATIONS)
Peromyscus maniculatus, Vero E-6 cells

Cell system (a)	Virus passage history (b)	Evidence of Infection						
		CPE			PLAQUES			Growth Without CPE
		Day (c)	Extent (d)	Titer TCD50/ml (e)	Day (c)	Size (f)	Titer PFU/ml (e)	+/- (g)

Section VII - Natural Host Range (Additional text can be added below table)

Vertebrate (species and organ) and arthropod	No. isolations/No. tested	No. with antibody/No. tested Test used	Country and region
Peromyscus maniculatus		30%/813 * ELISA	Four Corners area, USA June-August, 1993 (15)
Peromyscus truei		19.6%/275	
Peromyscus boylii		5.9%/51	
Tamias dorsalis		3.6%/166	
Tamias minutus		5.0%/19	
Tamias quadrivittatus		13.0%/30	
Mus musculus		3.9%/51	
Neotoma albigula		2.9%/69	
Reithrodontomys megalotis		28.6%	
Spermophilus variegatus		1.0%/90	
Sylvilagus auduboni (nonrodent species)		12.5%/8	

* Percent of rodents positive for ELISA antibody using PH antigen/total number of specimens tested. Almost all specimens also tested with SEO and PUU antigens. With two exceptions, PH antigen gave a higher percent positive reactions than the other two antigens. The following rodent species (number tested vs PH antigen) were negative for ELISA antibody for either PH and SEO or, PH, SEO and PUU antigens. Peromyscus nasutus (10), Peromyscus crinitus (1), Ammospermophilus leucurus (14), Cynomys gunnusoni (1), Dipodmys merriami (4), Dipodomys ordii (6), Dipodomys species (1), Microtus longicaudus (2), Microtus mexicanus (1), Microtus montanus (2), Microtus pennsylvanicus (4), Neotoma mexicana (20), Neotoma micropus (4), Neotoma stephansi (6), Neotoma species (2), Onychomys leucogaster (10), Onychomys species (2), Perognathus flavus (5), Perognathus species (2), Sigmodon hispidus (6), Spermophilus spilosoma (4), Spermophilus tridecemlineatus (7), Spermophilus lateralis (2).

Section VIII - Susceptibility to Experimental Infection (include viremia)

Experimental host and age	Passage history and strain	Inoculation Route-Dose	Evidence of infection	AST (days)	Titer log10/ml
mice (nb)		ic			
"" (nb)		ip			
"" (nb)		sc			
"" (wn)		ic			
"" (wn)		ip			

Section IX - Experimental Arthropod Infection and Transmission

Arthropod species & virus source(a)	Method of Infection log10/ml (b)		Incubation period (c)		Transmision by bite (d)		Assay of arthropod, log10/ml (e)		
	Feeding	Injected	Days	°C	Host	Ratio	Whole	Organ	System

Section X - Histopathology

Character of lesions (specify host)
rodent: no gross histopathology

Inclusion Bodies — Intranuclear

Organs/Tissues Affected

Category of tropism

Section XI - Human Disease

In Nature
Significant

Residual

Death
Significant

Subclinical

Overt Disease

Clinical Manifestations
acute respiratory distress after a few days of non-specific prodromal syndrome (fever, myalgia, malaise)

Number of Cases

Category (i.e. febrile illness, etc.)
respiratory distress

Section XII - Geographic Distribution

Known (Virus detected)
states west of the Mississippi River, Arizona, California, Colorado, North Dakota, South Dakota, Louisiana, Montana, Nevada, New Mexico, Oregon, Texas

Suspected (Antibody only detected)

Section XIII - References

1. Centers for Disease Control. 1993. M.M.W.R. 42:421-424.
2. Centers for Disease Control. 1993. M.M.W.R. 42:441-443.
3. Centers for Disease Control. 1993. M.M.W.R. 42:477-479.
4. Centers for Disease Control. 1993. M.M.W.R. 42:495-496.
5. Centers for Disease Control. 1993. M.M.W.R. 42:517-519.
6. Centers for Disease Control. 1993. M.M.W.R. 42:570-572.
7. Centers for Disease Control. 1993. M.M.W.R. 42:707.
8. Centers for Disease Control. 1993. M.M.W.R. 42:770.
9. Centers for Disease Control. 1993. M.M.W.R. 42:816-820.
10. Feldmann, H., Sanchez, A., Morzunov, S., et al. 1993. Virus. Res. In press.
11. Hughes, J.M., Peters, C., Cohen, M., et al. 1993. Science. 262:832-836.
12. Nichol, S., Spiropoulou, C., Morzunov, S., et al. 1993. Science. 262:914-917.
13. Marshall, E., Stone, R. 1993. Science. 262:832-836.
14. Spiropoulou, C., Morzunov, S., Feldmann, H., et al. 1994. Virology. 200:715-723.
15. Childs, J.E., Kslazek, T.G., Spiropoulou, C., et al. 1994. J. Inf. Dis. 169:1271-1280.

Remarks

Sin Nombre virus is the apparent etiologic agent of Hantavirus Pulmonary Syndrome (11).