Virus Name: Lone Star	Abbreviation: LSV

Status
Possible Arbovirus

Select Agent
No

SALS Level
2

SALS Basis
Results of SALS surveys and information from the Catalogue.

Other Information

Antigenic Group
Ungrouped

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
TMA 1381

Accession Number

Original Date Submitted
11/7/1984

Family
Bunyaviridae

Genus
Bunyavirus-like

Information From
Robert H. Kokernot

Address
Univ. of Texas, Sch. of Pub. Health, P.O. Box 20186, Houston, Texas 77025 USA

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
Kokernot, et al. (1)

Isolated at Institute
University of Illinois, Urbana, IL

Host Genus
Amblyomma americanum

Species

Host Age/Stage
Nymph

Sex
Not Answered

Isolated From

Isolation Details

Signs and Symptoms of Illness

Arthropod

Time Held Alive before Inoculation

Collection Method
Removed from woodchuck (Marmota monax)

Collection Date
6/20/1967

Place Collected (Minimum of City, State, Country)
Land Between the Lakes, W. Kentucky

Latitude
36° 50' N

Longitude
88° 0' W

Macrohabitat
Oak Hickory Forest

Microhabitat
Border of abandoned fields and deciduous forest

Method of Storage until Inoculated
Solid CO2

Footnotes

Section III - Method of Isolation

Inoculation Date
9/8/1967

Animal (Details will be in Section 6)
nb mice

Route Inoculated
Intracerebral

Reisolation
Yes

Other Reasons

Homologous Antibody Formation by Source Animal

Test(s) Used

Footnotes

Section IV - Virus Properties

Physicochemical
RNA

Pieces (number of genome segments)	Infectivity	Sedimentation Coefficients(s) (S)
Percentage wt, of Virion Protein	Lipid	Carbohydrate
Virion Polypeptides: Number	Details	
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) **1:100**	After Treatment Titer **<2.5 dex**	Control Titer **7.1 dex**

Other (formalin, radiation)

Virion Morphology

Shape	Dimensions **90-100 nm**	
Mean nm	Range nm	
Measurement Method **Electron microscopy**	Surface Projections/Envelope	Nucleocapsid Dimensions, Symmetry

Morphogenesis

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

Hemagglutination

Hemaggiutination	Antigen Source	Erythrocytes (species used)
No	**SMB ext. by sucrose-acetone**	**Goose**
pH Range **5.8-7.2**	pH Optimum	
Temperature Range **RT**	Temperature Optimum	

Remarks

Serologic Methods Recommended
NT and CF

Footnotes

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

Neutralization tests using 2-3 day mice inoculated intraperitoneally with Lone Star virus and specific mouse immune ascitic fluids prepared against 17 arboviruses from the United States and Canada gave negative results. The homologous (Lone Star virus) immune ascitic fluid neutralized more than 5 dex of virus. Negative results were with the following: Group A (eastern and western encephalitis); Group B (St. Louis encephalitis, Powassan, Modoc, Rio Bravo); Bunyamwera Group (Cache Valley and Tensaw); California (California encephalitis and trivittatus); Simbu (Mermet (AV137); Hughes (Hughes); Turlock (Turlock); Ungrouped (Colorado tick fever, Hart Park, Flanders, Silverwater and Sawgrass).
Complement Fixation

First series: The titer of antigen in homologous system was greater than 128 and the titer of immune ascitic fluid was 16 to 32. Negative results with 17 agents listed above for the NT as well as the following: Venezuelan equine encephalitis, Mahogany Hammock, Shark River, Gumbo Limbo, Tamiami, Cowbone Ridge, Montana Myotis leukoencephalitis and EMC.
Second series done by Dr. Jordi Casals, WHO International Arbovirus Reference Center, Yale Arbovirus Research Unit. Lone Star antiserumm reacted only with its own antigen, in a titer equal to or greater than 256. In these tests Lone Star immune serum was tested in two-fold dilutions ranging from 1:8 to 1:256 against the following tick virus antigens diluted 1:4, 1:8 and 1:16. Negative results were obtained with the following: Bakau, Bandia, Bhanja, Chenuda, Colorado tick fever, DGK, Dugbe, Farallon, Ganjam, Grand Arbaud, Hazara, Johnston Atoll, Kaisodi, Kemerovo, Lanjan, Lipovnik, Mamawa, Matucare, Nyamanini, Qalyub, Quaranfil, Sawgrass, Silverwater, Soldado, Tribec, Upolu, Uukuniemi, Wanowrie, Hughes, Tick 39 (Thailand).

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)
Blood (LV)

Lab Methods of Virus Recovery (ALL ISOLATIONS)
Newborn mice

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)	
Vero (CL)						Plaques	7.3*		
Duck embryo (PC)			CPE			No plaques			
BHK-21 (CL)						Plaques	7.4		

* Expressed in dex

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
Amblyomma americanum	1		Kentucky, USA
Man		0/55 NT	Illinois, USA
Man		0/111 NT	Kentucky, USA
Dog		0/51 NT	Illinois, USA
Cattle		0/70 NT	
Woodchuck		0/33 NT	Kentucky, USA
Opossum		0/34 NT	
Raccoon		21/50 NT	
Cottontail		0/15 NT	

In these neutralization tests, suckling mice 2 to 4 days of age were inoculated intraperitoneally.

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)	SMB 2	ic 0.03	Death	5-6	7.1
Mice (nb)		ip 0.03	Death	6-7	6.7
Mice (nb)		sc			
Mice (wn)		ic 0.03	Morbidity; few deaths		
Mice (wn)		ip 0.03	Antibody		
woodchuck* (ad)		sc 0.05	Viremia		
chick embryo (10 day)		ys 0.5	None		
duck embryo (10 day)		allantoic 0.1	None		

* Material inoculated in 6 adult woodchucks contained 41,500 suckling mouse IP LD50 0.03/ml.

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)

Inclusion Bodies — Intranuclear

Organs/Tissues Affected

Category of tropism

Section XI - Human Disease

In Nature	Residual	Death
Subclinical	Overt Disease	

Clinical Manifestations

Number of Cases — Category (i.e. febrile illness, etc.)

Section XII - Geographic Distribution

Known (Virus detected)
Kentucky, USA

Suspected (Antibody only detected)

Section XIII - References

1. Kokernot, R.H., et al. 1969. Am. J. Trop. Med. Hyg. 18:789-795.

Remarks