Virus Name: Silverwater	Abbreviation: SILV

Status
Probable Arbovirus

Select Agent
No

SALS Level
2

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

Other Information

Antigenic Group
Kaisodi

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
No. 131

Accession Number

Original Date Submitted
1/21/1985

Family
Bunyaviridae

Genus
Bunyavirus-like

Information From
Donald M. McLean, M.D.

Address
Division of Medical Microbiology, Univ. of British Columbia, Vancouver, B.C. V6T 1W5, Canada

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
Donald M. McLean

Isolated at Institute
Hospital for Sick Children, Toronto, Canada

Host Genus
Haemaphysalis leporispalustris ticks

Species

Host Age/Stage

Sex
Not Answered

Isolated From

Isolation Details

Signs and Symptoms of Illness

Arthropod
Engorged

Time Held Alive before Inoculation
<1 week

Collection Method

Collection Date
6/12/1960

Place Collected (Minimum of City, State, Country)
Silverwater, Ontario, Canada

Latitude
46° N

Longitude
82° W

Macrohabitat
Rural lakeside area surrounded by grass and nearby mixed deciduous and coniferous forest

Microhabitat
Attached to two Lepus americanus (snowshoe hares)

Method of Storage until Inoculated
Held alive at <10dC for <1 week, then stored at -70dC

Footnotes

Section III - Method of Isolation

Inoculation Date
8/23/1960

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

Pieces (number of genome segments)	Infectivity	Sedimentation Coefficients(s) (S)
Percentage wt, of Virion Protein	Lipid	Carbohydrate
Virion Polypeptides: Number	Details **Molecular studies conducted with Silverwater virus (Kaisodi serogroup) have indicated that its RNA species and its poly- peptides resemble those of Uukuviruses (12).**	
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) **1:1000**	After Treatment Titer **3.5 dex**	Control Titer **5.0 dex**

Other (formalin, radiation)

Virion Morphology

Shape	Dimensions	
Mean nm	Range nm	
Measurement Method	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 **No**	Antigen Source	Erythrocytes (species used)
pH Range	pH Optimum	
Temperature Range	Temperature Optimum	

Remarks

Serologic Methods Recommended
CF, NT

Footnotes

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

Silverwater virus diluted to contain 30 to 100 intracerebral newborn mouse LD50 was not neutralized by antisera to the following viruses: EEE, WEE, SLE, POW, CTF, BUN.
No complement-fixation reactions with Silverwater antigen in the presence of antisera to the above-mentioned viruses, except CTF which was not tested. Antigens of POW, BUN, SLE, and EEE did not fix complement in the presence of SIL antiserum.
The Yale Arbovirus Research Unit showed that Silverwater is related to Kaisodi and Lanjan by cross CF tests and thus is a member of the Kaisodi group [4] .

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)

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)	
Rhesus kidney (PC)	SMB 2		No CPE						
BHK-21, Vero (CL)			CPE (8)						
LLC-MK2 (CL)	P-5				6	3 mm	7.2* (10)		
Vero (CL)					15	2 mm	5.0 (10)		

* 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
Man		0/156 CF	Manitoulin Is., Ontario, Canada (3)
Lepus americanus (snowshoe hare)		19/309 CF	
Lepus americanus		21/137 CF	Powassan, Ontario, Canada (5, 6)
Lepus americanus		292/1179 NT	Alberta, Canada (9)
Tamiasciurus hudsonicus (red squirrel)		2/23 NT	
Eutamias minimus (chipmunk)		1/1 NT	
Bos taurus (cattle)		4/37 NT	
Canis laterans (coyote)		2/5 NT	
Lepus americanus (blood)	3		Rochester, Alberta, Canada (7, 8)
Haemaphysalis leporispalustris	2/49		Manitoulin, Is., Ontario, Canada (3)
H. leporispalustris	2/80		Powassan, Ontario, Canada (5, 6)
H. leporispalustris larvae, nymphs, adults	13		Rochester, Alberta, Canada (7, 8)
H. leporispalustris eggs	2		Rochester, Alberta, Canada (8)
H. leporispalustris adults	1		Wisconsin, USA (8)
H. leporispalustris	1		Dome, Alaska, USA (11)

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)	No. 131, SMB 2	ic 0.02	Encephalitis, death	5-6	5.0
Mice (nb)		ip			
Mice (nb)		sc			
Mice (wn)	SMB 4	ic 0.03	Encephalitis, death	12	1.0
Mice (wn)		ip			
hamster (ad)	SMB 2	sc 0.03	Viremia 4th, 6th days, survived; CF antibody 27th, 46th days		
rabbit (ad)		sc 0.03	CF antibody 27th day, survived		
guinea pig (ad)		ip 0.01	CF antibody 26th day, survived		
Lepus americanus (yg,ad)	Low	ic,iv	Viremia in 3/9 animals (8)	5	3.0-5.0

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)
Minimal features of encephalitis in mouse brain

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)
Ontario, Alberta, Canada; Wisconsin, Alaska, USA

Suspected (Antibody only detected)
Utah (9)

Section XIII - References

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Remarks