Virus Name: Gray Lodge		Abbreviation: GLOV
Status **Possible Arbovirus**	Select Agent **No**	SALS Level **3**

SALS Basis
Isufficient experience with virus; i.e., experience factor from SALS surveys was less than 500 in laboratory facilities with low biocontainment.

Other Information

Antigenic Group
Ungrouped

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
BFN 3187

Accession Number

Original Date Submitted
9/7/1984

Family
Rhabdoviridae

Genus
Not listed

Information From
Robert P. Scrivani

Address
Arbovirus Research Laboratory, School of Public Health, University of California, Berkeley

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
Dr. W.C. Reeves

Isolated at Institute
Berkeley, California

Host Genus
Culex tarsalis, pool of 36

Species

Host Age/Stage
Adult

Sex
Female

Isolated From

Isolation Details

Signs and Symptoms of Illness

Arthropod

Time Held Alive before Inoculation

Collection Method
CO2 bait trap

Collection Date
8/4/1971

Place Collected (Minimum of City, State, Country)
Gray Lodge Wildlife Area, Butte Co., California

Latitude
39° N

Longitude
122° W

Macrohabitat
Agricultural and riparian habitat adjacent to Sacramento River

Microhabitat
Tule swamp and barley field

Method of Storage until Inoculated
Revco storage at -70dC

Footnotes

Section III - Method of Isolation

Inoculation Date
8/26/1971

Animal (Details will be in Section 6)
(Tissue Culture)

Route Inoculated

Reisolation
Yes

Other Reasons
No other virus like this in laboratory.

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) **1:2**	After Treatment Titer **<1.0 dex**	Control Titer **5.0 dex**
Lipid Solvent (chloroform)	After Treatment Titer	Control Titer
Lipid Solvent (deoxycholate) **1:1000**	After Treatment Titer **<1.0 dex**	Control Titer **4.0 dex**

Other (formalin, radiation)

Virion Morphology

Shape **Rhabdovirus**	Dimensions **ca. 50 x 235 nm**	
Mean nm	Range nm	
Measurement Method **Electron microscopy (ultrathin section)**	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, Vero cell cultures**	**Goose**
pH Range	pH Optimum	
5.8-7.0		
Temperature Range	Temperature Optimum	

Remarks
*** Replication not inhibited by 5-bromodeoxyuridine.**

Serologic Methods Recommended
CF, NT, IFA

Footnotes
*** Replication not inhibited by 5-bromodeoxyuridine.**

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

Complement fixation and plaque-reduction neutralization test results with Gray Lodge viral antigen and antibody to some rhabdoviruses:

Antibody [a]	Complement fixation	Plaque-reduction neutralization
Gray Lodge	16 [b]	160 [b]
Hart Park (AR70)	< 8	< 5
Hart Park (V4038) [c]	16	5
Flanders (R11987) [d]	< 8	< 5
Flanders (63V162) [e]	16	5
Grouping Ascitic Fluids [f]		
Ploy valent 7	< 8	< 5
Polyvalent Rabies	< 8	< 5
Group VSV	< 8	< 5

[a] Hyperimmune mouse sera or asicitc fluid

[b] Reciprocal of highest antibody dilution giving 3+ to 4+ complement-fixation or 80% reduction of a viral challenge of 60-70 PFU

[c] Obtained from Dr. R. Emmons, California State Dept. of Public Health

[d] Obtained from Dr. R. Shope, YARU

[e] Obtained from CDC, Fort Collins, Colorado

[f] Reference grouping rhabdoviral ascitic fluids obtained from NIAID.

No inhibition by BFN 3187 hyperimmune mouse serum (HIMS) of hemagglutination with WEE, SLE, POW, MOD, RB, CE, LOK, MD, BUT TUR, and VEE antigens. No indirect fluorescent antibody (IFA) was observed between BFN 3187 infected Vero cells and 1:5 dilutions of polyvalent grouping mouse ascitic fluids for Group C, Group Guama, Group Simbu, Group VSV, Group Bunyamwera, Group Califor- nia, Group Tacaribe, Group Phlebotomus fever, Group A, Polyvalent Quaranfil, Polyvalent Anopheles A, Polyvalent Bwamba, Polyvalent Patois, Group Capim, Group B, Polyvalent 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, and Polyvalent Rabies. Plaque-reduction neutralization tests with BFN 3187 antigen against the above polyvalent grouping fluids were also negative (BFN 3187 homologous titer was 160). By CF test, BFN 3187 antigen did not react with polyvalent grouping fluids for Group VSV, Polyvalent Rabies, and Polyvalent 7, whereas the homologous reaction with HIMS was 16. BFN 3187 antigen reacted at low titers [16] with HIMS to 2 of 4 Hart Park/Flanders viral strains in CF tests where homologous titers to Hart Park/Flanders strains ranged from 250 to <1024.
Since registration of Gray Lodge virus, it was tested by by CF against 36 other known rhabdoviruses, including members of the Hart Park serogroup, and it did not cross-react with any of the other rhabdoviruses [2] . Subsequently, antibody to Gray Lodge virus was tested against 50 known rhabdo- viruses without any evidence of cross-reaction [3] . On the basis of these studies, Gray Lodge virus was omitted from the Hart Park serogroup (ed.).

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)

Lab Methods of Virus Recovery (ALL ISOLATIONS)
Vero cell cultures

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)	P19	3	4+	7.5(h)	3	2-3 mm	7.2(h)		
Duck embryo (g) (PC)	P3				4	< 1 mm	1.0		
Cx tarsalis (CL)	P19							-	
Ae dorsalis (CL)								+	
PS-Y-15(CL)					3	2-3 mm	5.8		
BHK-21 (CL)		2	CPE	7.2 (4)					
Vero (CL)		3	CPE	6.7 (4)					
E6 (CL)		3	CPE	6.0 (4)					
CER (CL)		2	+ -	5.0 (4)				+	
C6/36 (CL)								- (4)	
Vero (CL)					4	Plaques (4)			

(g) Passage of infected duck embryo cell cultures resulted in loss of virus as assayed by plaquing in Vero cell cultures.

(h) 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
Culex tarsalis	1/thousands		Central Valley, California, U.S.A.

None from thousands of samples of other mosquito species, wild avian and mammalian bloods collected in the Central Valley of California.

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)	Vero P18	ic 0.01	Asymptomatic in mice		5.0*
Mice (nb)		sc 0.03	None		
Mice (wn)		ic 0.10	Antibody after 2-4 injections		
Mice (wn)		ip	7 days apart, but not after 1 injection--no viremia		
rabbits	Vero P19; 3.0 dex	sc 0.10	None		
hamsters		sc 0.10	None		
guinea pigs		sc 0.01	None		
1-week old chicks		sc 0.10	None		

* Virus titer in brain tissue; brain suspension gave CPE in Vero cell cultures 3 and 4 days post inoculation.

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
Culex tarsalis; Vero P21		5.7	10	26			<1.0 day 1 to 4.7 day 10		Vero CC
			7		Drop of blood(1)	5/21			
Culex tarsalis; Vero P21		7.0	14	26		2/17			Vero CC
			21			0/28			
Culex tarsalis; Vero P21	7.0		13,21	26			Neg.		Vero CC
					Drop of blood(1)				
Aedes dorsalis; Vero P21		6.0	12	26		2/4	>3.0		Vero CC

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)
Central Valley, California, USA

Suspected (Antibody only detected)

Section XIII - References

1. Gubler, D.J. and Rosen, L. 1976. Am. J. Trop. Med. Hyg. 25:146-150.
2. Frazier, C.L. and Shope, R.E. Personal communication.
3. Tesh, R., et al. 1983. J. Gen. Virol. 64:169-176.
4. Kerschner, J. Personal communication. 1983.

Remarks