

<b>Virus Name: Flanders</b>		<b>Abbreviation: FLAV</b>
Status <b>Possible Arbovirus</b>	Select Agent <b>No</b>	SALS Level <b>2</b>
SALS Basis <b>Results of SALS surveys and information from the Catalogue.</b>		
Other Information		
Antigenic Group <b>Hart Part</b>		

**SECTION I - Full Virus Name and Prototype Number**

Prototype Strain Number / Designation <b>61-7484</b>	Accession Number	Original Date Submitted <b>12/12/1984</b>
Family <b>Rhabdoviridae</b>	Genus	
Information From <b>Elinor Whitney</b>	Address <b>Division of Laboratories and Research, New Scotland Ave., Albany, N.Y. 12201</b>	
Information Footnote <b>Reviewed by editor</b>		

**Section II - Original Source**

Isolated By (name) <b>Elinor Whitney (1)</b>	Isolated at Institute <b>Div. Labs. and Research, Albany, N.Y.</b>	
Host Genus <b>Culiseta melanura (pool of 25)</b>	Species	Host Age/Stage <b>Adult</b>
Sex <b>Female</b>		
<u>Isolated From</u>	<u>Isolation Details</u>	
Signs and Symptoms of Illness	Arthropod <b>Depleted</b>	
Time Held Alive before Inoculation		
Collection Method <b>New Jersey light trap</b>	Collection Date <b>8/8/1961</b>	
Place Collected (Minimum of City, State, Country) <b>Town of Flanders, Suffolk Co., L.I., New York</b>		
Latitude <b>43° N</b>	Longitude <b>76° W</b>	
Macrohabitat <b>Swamp edge in woods (Sears Pond outlet)</b>	Microhabitat <b>50 feet west of Route 24, 50 feet north of stream</b>	Method of Storage until Inoculated <b>Frozen in CO2 box</b>
Footnotes		

**Section III - Method of Isolation**

Inoculation Date  
**8/31/1961**

Animal (Details will be in Section 6)  
**nb mice**

Route Inoculated <b>Intracerebral</b>	Reisolation <b>Yes</b>
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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 <b>8</b>	Details <b>1 - 180,000 MW; 2 - 81,000 MW, glycosylated; 3 - 54,000 MW; 4 - 43,000 MW; 5 - 33,000 MW; 6 - 27,000 MW; 7 - 23,000 MW; and 8 - 19,000 MW (11).</b>	
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) <b>1:1</b>	After Treatment Titer <b>2.4 dex</b>	Control Titer <b>3.4 dex</b>
Lipid Solvent (chloroform)	After Treatment Titer	Control Titer
Lipid Solvent (deoxycholate) <b>1:500</b>	After Treatment Titer <b>&lt;1.0 dex</b>	Control Titer <b>3.2 dex</b>

Other (formalin, radiation)

**Virion Morphology**

Shape <b>Rhabdovirus morphology*</b>	Dimensions
Mean nm	Range nm
Measurement Method	Surface Projections/Envelope
	Nucleocapsid Dimensions.

**Morphogenesis**

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

**Hemagglutination**

Hemagglutination <b>No</b>	Antigen Source <b>SMB ext. by sucrose-acetone</b>	Erythrocytes (species used) <b>Goose</b>
pH Range <b>5.8-7.6</b>	pH Optimum	
Temperature Range <b>4dC, RT, 36dC</b>	Temperature Optimum	

## Remarks

\* **Flanders virus is a member of the rhabdovirus group and is related morphologically to other bullet-shaped viruses such as VSV, Cocal, Kern Canyon, rabies, and bovine ephemeral fever (3,4).**

## Serologic Methods Recommended

**CF and NT**

## Footnotes

\* **Flanders virus is a member of the rhabdovirus group and is related morphologically to other bullet-shaped viruses such as VSV, Cocal, Kern Canyon, rabies, and bovine ephemeral fever (3,4).**

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

No antigenic relationship shown by CF and NT with the following agents: EE, WE, SLE, POW, LCM, psittacosis, herpes simplex, and by NT with the following hyperimmune sera prepared with MM, Theiler's TO, Cache Valley, NDV, and CTF. Dr. Jordi Casals performed HI tests with sera prepared from three of our isolates and the following antigens:

Group A:	Chik., Sindbis, Semliki, Mayaro, EE, WE;
Group B:	YF, WN, Zika, Wesselsbron, Uganda S, SLE;
Group C:	Oriboca, Caraparu, Bunyamwera Group, Cache Valley, Ilesha, Germiston, Guaroa;
and California encephalitis virus (Hammons and Reeves strain).	No relationship noted.

Immune sera <sup>a</sup> Other N.Y. isolates	CF Antigen Registered virus	
	Ht/Ho	Ratio
61-7721	36/36	1

61-7499

30/36

0.8

61-7592

23/36

0.6

Immune sera <sup>a</sup>	Antigen registered virus			Antigen	Immune serum registered virus		
	CF		NT		CF		NT
	Ht/Ho	Ratio	Ht/Ho		Ht/Ho	Ratio	Ht/Ho
Hart Park	<4/16		10/215	Hart Park	4/16	0.25	205/215
Virus from Dr. LaMotte <sup>b</sup>	32/16	2	108/215	Virus from Dr. LaMotte	32/16	2	>256/215
Texas 1 <sup>c</sup>	55/64	0.85					
Texas 2 <sup>c</sup>	55/64	0.85					

<sup>a</sup> Hyperimmune mouse serum

<sup>b</sup> Virus isolated by Dr. LaMotte from *Culex tarsalis*, collected Texas, June, 1965.

<sup>c</sup> Strains isolated by Mr. James E. Grimes in Texas prior to 1962.

Flanders 61-7484 and Hart Park AR 70 antigenically related but different from each other in NT, CF and double-diffusion tests [7].

Closely related to HP. May be a strain of HP, or a member of a Hart Park complex [8].

**Section VI - Biologic Characteristics**

Virus Source (all VERTEBRATE isolates)  
Liver (LV), spleen (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 +/- (g)
		Day (c)	Extent (d)	Titer TCD50/ml (e)	Day (c)	Size (f)	Titer PFU/ml (e)	
BHK-21 (CL)			No CPE					- (10)
Vero (CL)		3	CPE	6.0(d) (10)				
E6 (CL)		5	No CPE	6.0				+ (10)
CER (CL)			No CPE					- (10)
PS (CL)			No CPE					- (10)

(d) Expressed in dex

Vertebrate (species and organ) and arthropod	No. isolations/No. tested	No. with antibody/No. tested Test used	Country and region
Culiseta melanura	5		New York
Culex pipiens	1/71 pools		New York
Seiurus aurocapillus (ovenbird)	1		Long Island, New York, 1961
Cx salinarius	13		Westchester County, New York, 1970
Cx territans	25		Oswego County, New York, 1971
Cx tarsalis	2		Saskatchewan, Canada, 1967 (5)
Immature starling (liver)	1		Suffolk County, New York, 1971

Experimental host and age	Passage history and strain	Inoculation Route-Dose	Evidence of infection	AST (days)	Titer log <sub>10</sub> /ml
Mice (nb)	61-7484	ic 0.03	Conv., paralysis, death	4-5	6.7
Mice (nb)	SM2	ip			
Mice (nb)		sc			
Mice (wn)		ic 0.03	None		
Mice (wn)		ip			
chick embryo(7 days)		ys 0.2	None		
chick embryo (10 days)		am. s. 0.1	Sluggish hemorrhage	4-5	
chicks (2-8 hr)	61-7484, SM6	ic 0.1	NT antibody		
chicks (2-8 hr)		sc 0.1	None		
chicks (300-400 gm)		ic 0.1	None		
hamsters (wn)		ic 0.1	None		
guinea pigs (wn)		ic 0.1	None		

Remarks: Egg passages checked in 1 day-old mice for presence of virus. Only amniotic fluid showed evidence of virus proliferation.

**Section IX - Experimental Arthropod Infection and Transmission**

Arthropod species & virus source(a)	Method of Infection log <sub>10</sub> /ml (b)		Incubation period (c)		Transmission by bite (d)		Assay of arthropod, log <sub>10</sub> /ml (e)		
	Feeding	Injected	Days	°C	Host	Ratio	Whole	Organ	System

**Section X - Histopathology**

Character of lesions (specify host)

**SM brains showed encephalitis and encephalomalacia; cerebrum and cerebellum were most severely damaged; some destruction in Ammon's horn. Myocarditis noted with two strains. No inclusions seen.**

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)

**New York; Texas; Illinois (6); Florida (7); Connecticut (9), USA; Canada.**

Suspected (Antibody only detected)

Section XIII - References

1. Whitney, Elinor. 1964. *Am. J. Trop. Med. Hyg.* 13:123-131.
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3. Murphy, F.A., et al. 1966. *Virology* 30:314-317.
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6. Kokernot, R.H., et al. 1969. *Am. J. Trop. Med. Hyg.* 18:762-767.
7. Boyd, K.R. 1972. *Infect. and Immun* 5:933-937.
8. Casals, J. Personal communication. Dec. 1972.
9. Shope, R.E. Personal communication.
10. Kerschner, J. Personal communication. 1983.
11. Boyd, K.R., 1988. *Virology* 163:349-358.

Remarks