

<b>Virus Name: Getah</b>		<b>Abbreviation: GETV</b>
Status <b>Arbovirus</b>	Select Agent <b>No</b>	SALS Level <b>3</b>
SALS Basis <b>Disease is sheep, cattle, or horses.</b>		
Other Information <b>USDA Restricted</b>		
Antigenic Group <b>A</b>		

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

Prototype Strain Number / Designation <b>MM2021</b>	Accession Number	Original Date Submitted <b>7/31/1984</b>
Family <b>Togaviridae</b>	Genus <b>Alphavirus</b>	
Information From <b>William F. Scherer</b>	Address <b>Cornell University Medical College, 1300 York Avenue, New York, N.Y.10021</b>	
Information Footnote <b>Revised</b>		

**Section II - Original Source**

Isolated By (name) <b>US Army Med. Res. Unit (1)</b>	Isolated at Institute <b>Kuala Lumpur, Malaya, Malaysia</b>	
Host Genus <b>Culex (Culex) gelidus</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	
Time Held Alive before Inoculation		
Collection Method <b>Cow-baited trap</b>	Collection Date <b>10/17/1955</b>	
Place Collected (Minimum of City, State, Country) <b>Seaport Rubber Estate near Kuala Lumpur, Malaysia</b>		
Latitude <b>3° 13' N</b>	Longitude <b>101° 33' E</b>	
Macrohabitat <b>Rubber plantation</b>	Microhabitat <b>Under mature rubber tree canopy</b>	Method of Storage until Inoculated <b>Held alive 36 hours</b>
Footnotes		

**Section III - Method of Isolation**

Inoculation Date  
**10/19/1955**

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

Route Inoculated  
**Intracerebral**

Reisolation  
**No**

Other Reasons  
**Original isolate ultimately recognized as new for Malaya.**

Homologous Antibody Formation by Source Animal

Test(s) Used

Footnotes

**Section IV - Virus Properties**

Physicochemical  
**RNA, Single Strand**

Pieces (number of genome segments) <b>1</b>	Infectivity	Sedimentation Coefficients(s) (S)
Percentage wt, of Virion Protein	Lipid	Carbohydrate
Virion Polypeptides: Number <b>3</b>	Details <b>MW 56000, 54000, 34000 (SDS PAGE) (12)</b>	
Non-virion Polypeptides: Number	Details	
Virion Density	Sedimentation Coefficients(s) (S)	
Nucleocapsid Density	Sedimentation Coefficients(s) (S)	

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**Stability of Infectivity (effects)**

pH (infective range)

Lipid Solvent (ether - % used to test)	After Treatment Titer	Control Titer
Lipid Solvent (chloroform) <b>1:20</b>	After Treatment Titer <b>&lt;2.8 dex</b>	Control Titer <b>7.7 dex</b>
Lipid Solvent (deoxycholate) <b>1:1000</b>	After Treatment Titer <b>4.7 dex</b>	Control Titer <b>8.5 dex</b>
Other (formalin, radiation)		

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**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
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Inclusion Bodies	Other	
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**Hemagglutination**

Hemagglutination <b>Yes</b>	Antigen Source <b>SMB ext. by sucrose-acetone</b>	Erythrocytes (species used) <b>Goose</b>
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pH Range <b>6.2-6.8</b>	pH Optimum	
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Temperature Range <b>4-23dC</b>	Temperature Optimum <b>23dC</b>	
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Remarks

Serologic Methods Recommended  
**HI, CF, NT**

Footnotes

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

Antigenic relationships of Getah virus [2].

Immune Sera	Getah Antigen				
	Ht/Ho	HI	Ht/Ho	CF	NT Ht/Ho
		Ratio		Ratio	
Sagiyama	320/1280	1/4			>2.7/3.4
N544	2560/1280	2/1	512/256	2/1	
Bebaru	<10/320	>1/32	20/320	1/16	1.4/>4.4
Mayaro	80/1280	1/16			1.1/>4.4
Semliki	<10/640	>1/64	32/128	1/4	1.4/3.0
Sindbis	<10/1280	>1/128	16/128	1/8	<0.4/3.3
EEE	<10/2560	>1/256			<0.3/4.0
WEE	<10/2560	>1/256			<0.3/3.6
VEE	<10/10240	>1/1024			<1.2/>3.2
Chikungunya	<10/320	>1/32	64/64	1	<1.0/2.4

Middelburg

&lt;10/1280

&gt;1/128

N544: Strain of Getah virus isolated in Australia.

Antigens	Getah Immune Sera				
	HI		CF		NT
	Ht/Ho	Ratio	Ht/Ho	Ratio	Ht/Ho
Sagiyama			16/256	1/16	>3.3/4.5
N544	80/320	1/4	256/256	1	
Bebaru	20/640	1/32	20/640	1/32	1.4/4.5
Mayaro	<10/640	>1/64			2.4/4.5
Semliki	160/640	1/4	32/256	1/8	1.3/4.5
Sindbis	<10/640	>1/64	32/256	1/8	0.0/4.5
EEE	<10/640	>1/64	<4/32	-	0.3/4.5
WEE	<10/640	>1/64	<4/32	-	0.2/4.5
VEE	<10/640	>1/64			
Chikungunya	<10/640	>1/64	64/256	1/4	0.8/4.5
Middelburg	<10/640	>1/64			

NOTE: Sagiyama, Bebaru, and Ross River viruses have been proposed as subtypes of Getah. At least Sagiyama should be studied further to learn if it is a variety or subtype of Getah. See Ross River registration and Reference for further data on antigenic relationship among alphaviruses.

Getah virus has been placed in the SF complex of serogroup A. Sagiyama, Bebaru and Ross River viruses have been antigenically classified as subtypes of Getah virus in the SF complex [24].

**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 +/- (g)
		Day (c)	Extent (d)	Titer TCD50/ml (e)	Day (c)	Size (f)	Titer PFU/ml (e)	
Vero, LLC- MK2(CL)						Plaques (7)		
BHK-21 (CL)		1	extensive	3.6*	3	large	8.5* (12)	
C6/36 (CL)		1	moderate	3.2	4	large	8.1 (12)	

Produces CPE in human embryonic lung, monkey kidney (MA 104) equine fetal dermis, bovine embryonic kidney, swine embryonic kidney, Chinese hamster kidney, cow kidney, horse kidney and Hmlu (14) RK-13 (15).

\* Expressed in dex

Vertebrate (species and organ) and arthropod	No. isolations/No. tested	No. with antibody/No. tested Test used	Country and region
Culex (Culex) gelidus	1/461 (98,063 mosq.)		Kuala Lumpur, Malaysia
Cx (Cux) tritaeniorhynchus	1/585 (123,523 mosq.)		Kuantan, Malaysia
Cx tritaeniorhynchus	1		Cambodia (3); Osaka and Nagasaki, Japan(12, 13)
Cx bitaeniorhynchus	1		N. Queensland, AS (8)
An amictus	1		N. Queensland, AS (4)
Ae vexans nip.	3		Nagasaki area, Japan(6)
Cx vishnui	1		Philippines (23)
Man		39/97 NT	Kuala Lumpur, Malaysia
		27/74 NT	Kuantan, Malaysia
		33/98 NT	Rantau Panjang, Malaysia
Pigs	1		Japan (6)
Cattle		8/419 HI	N. Queensland, AS (9)
		4/31 NT	
Racehorses (blood)	62/209	172/281	Japan; 1978 (15, 17)
Racehorses	3/6	421/1,465 CF	Japan (16, 18)
Aedes, Anopheles hryanus	4		S. Amur Region, USSR; 1972-73 (25)
Aedes Vexans nipponii	1		

HI and NT antibody in Australia, possibly cross reactive with Ross River (4). Cattle antibody possibly Getah and not Ross River.

#### 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)	SM 2	ic 0.015	Death	4-7	
Mice (nb)		ip			
Mice (nb)		sc			
Mice (wn)	SM 3,4	ic 0.03	No disease		
Mice (wn)	SM 5	ip 0.2	No disease		
emb. eggs (10 day)	SM 6, YS 3	embryo 0.1	Death	3-4	<1.3
—	SM 6, YS 2, CAM 3	CAM 0.1	Lesions	3-4	<1.3
Macaca iris (yg ad)	SM 6, YS 2, CAM 4		No disease or infection		
rabbit (ad)	SM 2-7	ip 2.0	No disease: NT antibody produced		
horse	Horse plasma	im 2.0	Fever, rash, nasal discharge and edema (19)		3.8-5.8
horse	Vero and RK-13,1-3	in 2.0	Fever, rash, nasal discharge and edema (21)		2.8-3.8

Rabbit, rat, guinea pig, hamster, mouse; ip, sc, 4.5 dex, MI-110 str.; viremia, 1 day, HI antibodies (for rabbits and rats); viremia, 3 days, HI antibodies (for guinea pigs, hamsters and mice) (26).

Pregnant mice, sc inoc., viremia in mother and infection and death in some fetuses. Interuterine infection also resulted in reduction of litter size. High titers of virus detected in fetal brain and muscle (27).

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

Arthropod species & virus source(a)	Method of Infection log10/ml (b)		Incubation period (c)		Transmission by bite (d)		Assay of arthropod, log10/ml (e)		
	Feeding	Injected	Days	°C	Host	Ratio	Whole	Organ	System
Culex annulirostris	7.3/mosq.		7-15	25			7.8-8.3/mosq.		Baby mice, ic(10)
Aedes vigilax	>5.8/mosq.		7-10	25			>5.8/mosq.		Baby mice, ic (10)
Aedes funereus	4.8/mosq.		7-15	25			5.3/mosq.		Baby mice, ic (11)

**Section X - Histopathology**

Character of lesions (specify host)

**In suckling mice following ic inoculation: diffuse encephalitis, focal necrosis of liver and brown fat, occasional myositis. In horses, im or in inoculation: lymphocytic hyperplasia in lymph node and spleen. Occasional inflammation in dermis (20).**

Inclusion Bodies

Intranuclear

Organs/Tissues Affected

**Brain (LV), liver (LV), skeletal muscles (LV)**

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)

**Malaysia, Japan, Australia, Cambodia, Philippines (23)**

Suspected (Antibody only detected)

### Section XIII - References

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### Remarks

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