

<b>Virus Name: Belem</b>		<b>Abbreviation: BLMV</b>
Status <b>Possible Arbovirus</b>	Select Agent <b>No</b>	SALS Level <b>3</b>
SALS Basis <b>Insufficient experience with virus; i.e., experience factor from SALS surveys was less than 500 in laboratory facilities with low biocontainment.</b>		
Other Information		
Antigenic Group <b>Ungrouped</b>		

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

Prototype Strain Number / Designation <b>BeAn 141106</b>	Accession Number	Original Date Submitted <b>5/7/1984</b>
Family <b>Bunyaviridae</b>	Genus <b>Not listed</b>	
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Information Footnote <b>Revised</b>		

**Section II - Original Source**

Isolated By (name) <b>Belem Virus Laboratory</b>	Isolated at Institute <b>Inst. Evandro Chagas, Belem</b>	
Host Genus <b>Pyriqlena leucoptera (bird)</b>	Species	Host Age/Stage
Sex <b>Not Answered</b>		
<u>Isolated From</u>	<u>Isolation Details</u>	
<b>Serum/Plasma</b>		
Signs and Symptoms of Illness	Arthropod	
Time Held Alive before Inoculation		
Collection Method <b>Unknown</b>	Collection Date <b>5/30/1968</b>	
Place Collected (Minimum of City, State, Country) <b>APEG, IPEAN, Belem, Brazil</b>		
Latitude <b>1° 28' S</b>	Longitude <b>48° 27' W</b>	
Macrohabitat <b>Tropical rain forest</b>	Microhabitat <b>Ground level</b>	Method of Storage until Inoculated <b>Ice water (inoculated same day)</b>
Footnotes		

**Section III - Method of Isolation**

Inoculation Date  
**5/30/1968**

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

Route Inoculated	Reisolation
	<b>Not tried</b>

Other Reasons  
**Antibodies to the agent found among wild birds**

Homologous Antibody Formation by Source Animal  
**Not tested**

Test(s) Used  
**(never recaptured)**

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	
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) <b>1:1000</b>	After Treatment Titer <b>&lt;0.5 dex</b>	Control Titer <b>6.4 dex</b>
Other (formalin, radiation)		

**Virion Morphology**

Shape <b>Bunyavirus-like (3)</b>	Dimensions <b>78-108 nm</b>	
Mean nm	Range nm	
Measurement Method	Surface Projections/Envelope <b>envelope observed</b>	Nucleocapsid Dimensions, Symmetry

### **Morphogenesis**

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

### **Hemagglutination**

Hemagglutination <b>Yes</b>	Antigen Source <b>SMB ext. by sucrose-acetone + sonication</b>	Erythrocytes (species used) <b>Goose</b>
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pH Range <b>5.8-6.2</b>	pH Optimum <b>6.0</b>
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Temperature Range <b>RT and 37C</b>	Temperature Optimum <b>Room temperature</b>
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Remarks

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

Footnotes

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

Para virus reacted weakly by IFA with antibody to Belem virus and with a polyvalent grouping fluid containing antibody to Belem virus [3].

No antigenic relationship was detected by CF or HI test between Belem virus and any other arbovirus or virus from lower vertebrates found in Brazil. Tests performed at the YARU showed that Belem virus antigen was inhibited by a hyperimmune group C antiserum at a 1:20 dilution, but it did not react by CF, HI, and NT with any of the arbovirus grouping sera or sera of ungrouped strains available at YARU in 1976. This finding suggests that Belem virus belongs to the Bunyamwera supergroup but not to any currently recognized serogroup.

Pending the collection of more conclusive data which shows a definite serologic relationship of Belem virus to members of the Bunyamwera Supergroup, Belem virus is being listed as ungrouped (ed.).

**Section VI - Biologic Characteristics**

Virus Source (all VERTEBRATE isolates)  
**Blood (LV)**

Lab Methods of Virus Recovery (ALL ISOLATIONS)  
**Newborn mice and Vero cell cultures**

Cell system (a)	Virus passage history (b)	Evidence of Infection							Growth Without CPE +/- (g)
		CPE			PLAQUES				
		Day (c)	Extent (d)	Titer TCD50/ml (e)	Day (c)	Size (f)	Titer PFU/ml (e)		
Vero (CL)	SM 22	8-10	4+	4.0-5.0*					
Chick embryo (PC)	SM 20				4-6	1-2 mm	5.2*		

\* Expressed in dex

Vertebrate (species and organ) and arthropod	No. isolations/No. tested	No. with antibody/No. tested Test used	Country and region
Pyriglena leucoptera (blood)	1		APEG, IPEAN, Belem, Para, Brazil
Hylophylax naevia (blood)	1		Maraba-Jatobal, km.12, Para, Brazil
Man		12/22,058 HI	Amazon region, Brazil
Wild birds		63/9,731 HI	
Sentinel chickens		0/1,106 HI	
Domestic fowl		0/506 HI	
Rodents		0/200 HI	
Marsupials		0/67 HI	
Monkeys		0/6 HI	
Reptiles		0/1 HI	

**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)	P-3	ic 0.02	Death	4.0	8.1
Mice (nb)		ip 0.02	Death	7.4	(brain)
Mice (nb)		sc			
Mice (wn)		ic 0.03	Antibody		
Mice (wn)		ip 0.03	Antibody		
Mice (nb)	P-13	ic 0.02	Viremia, death (1)	3.0	6.7(serum)

**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

**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) <b>Brazil</b>
Suspected (Antibody only detected)

**Section XIII - References**

1. Belem Virus Laboratory, Belem, Brazil. 1969. Unpublished data. 2. Dias, L.B. Personal communication. 1977. 3. Zeller, H. et al. 1989. II. Arch. Virol. Submitted.
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**Remarks**

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