Virus Name: Belmont	Abbreviation: BELV

Status
Possible Arbovirus

Select Agent
No

SALS Level
2

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

Other Information

Antigenic Group
Ungrouped

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
R8659

Accession Number

Original Date Submitted
11/19/1984

Family
Bunyaviridae

Genus
Bunyavirus-like

Information From
R.L. Doherty

Address
Queensland Institute of Medical Research

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
R.L. Doherty, et al.

Isolated at Institute
Brisbane

Host Genus
Culex annulirostris Skuse

Species

Host Age/Stage
Adult

Sex
Female

Isolated From

Isolation Details

Signs and Symptoms of Illness

Arthropod

Time Held Alive before Inoculation

Collection Method
Aspirated from cattle

Collection Date
2/24/1968

Place Collected (Minimum of City, State, Country)
National cattle breeding station, Belmont, Australia

Latitude
23° 12' S

Longitude
150° 25' E

Macrohabitat
Flat alluvial country, clay soil, eucalypt woodland

Microhabitat
Tall perennial tussock grassland

Method of Storage until Inoculated
Overnight 5C, transported on liquid nitrogen, then stored in Revco at -60dC

Footnotes

Section III - Method of Isolation

Inoculation Date
7/25/1968

Animal (Details will be in Section 6)
nb mice

Route Inoculated
Intracerebral

Reisolation
Yes

Other Reasons
Antibody in wallabies elsewhere in Queensland

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 **Tripartate RNA genome (5). Typical member of Bunyaviridae, possible bunyavirus (5,6)**	
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) **50% final**	After Treatment Titer **3.8 dex**	Control Titer **7.0 dex**
Lipid Solvent (chloroform)	After Treatment Titer	Control Titer
Lipid Solvent (deoxycholate) **1:1000 final**	After Treatment Titer **<3.0 dex**	Control Titer **7.0 dex**

Other (formalin, radiation)

Virion Morphology

Shape	Dimensions **<100 nm**	
Mean nm	Range nm	
Measurement Method **Passed filter APD 100 nm with loss of**	Surface Projections/Envelope	Nucleocapsid Dimensions, Symmetry

Passed filter APD 100 nm with loss of titre		Symmetry

Morphogenesis

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

Hemagglutination

Hemaggiutination **No**	Antigen Source **SMB, blood ext. by sucrose-acetone + prot. Tr**	Erythrocytes (species used) **Goose**
pH Range **6.0-7.6**	pH Optimum	
Temperature Range	Temperature Optimum	

Remarks
Antigen tr. with trypsin and sonicated gave HA; hommologous inhi- bition, but not heterologous in one trial; has not been repeated.

Serologic Methods Recommended
CF

Footnotes
Antigen tr. with trypsin and sonicated gave HA; hommologous inhi- bition, but not heterologous in one trial; has not been repeated.

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

Studies at Queensland Institute of Medical Research:

No antigenic relationship by complement-fixation and neutralization tests to any arbovirus or suspected arbovirus isolated or available at this laboratory: Group A (Sindbis, Ross River, Getah, Bebaru); Group B (Murray Valley encephalitis, Kunjin, Kokobera, Edge Hill, Stratford, Alfuy, JBE, SLE, dengue types 1-4); Koongol group (Koongol, Wongal); Mapputta group (Mapputta, Trubananman, MK7532); Simbu group (Akabane, Aino (Samford)); Quaranfil group (Abal); Palyam group (D'Aguilar); Corriparta group (Corriparta); Eubenangee group (Eubenangee); Warrego group (Warrego, Mitchell River); others (Kowanyama, Almpiwar, Upolu, ephemeral fever, Charleville, Wallal, Wongorr, Ngaingan).
Studies at Yale Arbovirus Research Unit:

J.G. Carley and R.E. Shope found R8659 antigen non-reactive by CF test to immune ascitic fluids to 13 groups (A, B, C, Guama, Capim, Simbu, Bunyamwera, vesicular stomatitis, Anopheles A, Turlock California, phlebotomus fever and Tacaribe) and to these individual arboviruses: Argas 461, Anopheles A, Apeu, Sindbis, Tensaw, Mirim, Bandia, Acara, Benfica, Belem, Urucuri, Agua Preta, Bushbush, Boraceia, Ingwavuma, Chenuda, Changuinola, CoAr 3627, Chaco, Colorado tick, Farallon, Cotia, Navarro, California, Caraparu, Chandipura, Cocal, Candiru, Chagres, Congo, Buenaventura, Hughes, EgAn 1825-61, Embu, EEE, EHD (NJ), Eretmapodites 147, Guaroa, Ganjam, Germiston, Guajara, Guama, Grand Arbaud, Hazara, Ilesha, Icoaraci, Karimabad, Salehabad, Irituia, Nyando, Shuni, IbAn 17143, Jos, Gabek Forest (IbAn 10065), Orungo, IbAn 20433, IbAn 15736, Ieri, Junin, J19, Jurona, Kairi, Kaisodi, Ketapang, Kemerovo, Lagos bat, LBJ, Lukuni, Klamath, Mossuril, Nyamanini, Naples sandfly, Nkolbisson, Oriboca, Pak Argas T487, Pichinde, Pacui, Patois, Punta Toro, Piry, Qalyub, Bertioga, Soldado, Tete, Sororoca, Tamiami, Tacaribe, Thogoto, Tribec, Tataguine, Tembusu, Aruac, Oropouche, Melao, Kwatta, Turlock ETH Ar1846-64, Umbre, VSNJ, Wanowrie, Wad Medani and Wyeomyia.

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)	
PS (CL)(2)	SMB 3					Plaques	8.7*		
VSW (CL) (3)		5	CPE	>5.0*					

* 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 annulirostris	1/3,302		South-eastern Queensland, Australia, 1968 (1)
Cattle		8/148	Queensland, Australia (1)
Wallabies		32/55	
Kangaroos		17/40	
Various other vertebrates		0/288	

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)	SMB 3	ic 0.015	Death	4	8.9
Mice (nb)		ip 0.03	Death	4	8.7
Mice (nb)		sc			
Mice (wn)		ic 0.03	Death	7	7.2
Mice (wn)		ip 0.1	Antibody production		

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
Aedes aegypti, (SMB 5)	Intrathoracically inoculated with 0.0006 ml = 2.9 log10LD50 per mosquito, titration of whole mosquitoes in infant mice. No virus detected on first day after inoculation; virus detected =2.5-3.7 log10LD50 per mosquito, days 2-20 (4).								

Section X - Histopathology

Character of lesions (specify host)
Australia

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)
Australia

Suspected (Antibody only detected)

Section XIII - References

1. Doherty, R.L., et al. 1972. Aust. Vet. J. 48:81-86.
2.* Westaway, E.G. 1966. Am. J. Epidem. 84:439-456.
3.* Zeigel, R.F. and Clark, H.F. 1969. J. Natn. Cancer Inst. 43:1097-1102.
4. Carley, J.G., et al. 1973. J. Med. Ent. 10:244-249.
5. McPhee, D.A. and Westaway, E.G. 1981. J. Gen. Virol. 54:135-148.
6. McPhee, D.A. and Westaway, E.G. 1981. J. Gen. Virol. 54:149-160.

* References to cell lines, not to studies on Belmont virus.

Remarks