

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		
<u>Isolated From</u>	<u>Isolation Details</u>	
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
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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

Morphogenesis

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

Hemagglutination

Hemagglutination 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; homologous inhibition, but not heterologous in one trial; has not been repeated.

Serologic Methods Recommended
CF

Footnotes
Antigen tr. with trypsin and sonicated gave HA; homologous inhibition, 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)); Quarantil group (Abal); Palyam group (D'Aguilar); Corriparta group (Corriparta); Eubenangee group (Eubenangee); Warrego group (Warrego, Mitchell River); others (Kowanyama, Almpiwari, 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 +/- (g)
		Day (c)	Extent (d)	Titer TCD50/ml (e)	Day (c)	Size (f)	Titer PFU/ml (e)	
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)		Transmission 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		
<u>Inclusion Bodies</u>	<u>Intranuclear</u>	
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
