

Credible Resources for Vector-Borne Diseases



INTRODUCTION

Vector-borne diseases account for a significant fraction of the global infectious disease burden, contributing to more than 1 billion cases and 1 million deaths annually.¹ Of the known vectors, hematophagous arthropods, such as mosquitoes, ticks, and sand flies, are responsible for the transmission of some of the most devastating diseases throughout the world. Presently, vaccines are not available for many vector-borne diseases and treatment may be limited. Further, accurate diagnosis of these diseases can be complicated due to a variety of factors, including analogous clinical presentation, serological cross-reactivity, or the possibility of co-infection. Thus, accurate methods for early detection are imperative in managing microbial dissemination and minimizing the impact of these diseases on public health.

To aid in these efforts, ATCC offers a wide range of microorganisms and nucleic acids that support research on prevalent vector-borne diseases, including:

- Anaplasmosis
- Babesiosis
- Chikungunya
- Dengue

- Ehrlichiosis
- Leishmaniasis
- Lyme disease
- Malaria

- Rocky Mountain spotted fever
- Trypanosomiasis
- West Nile fever
- Zika

These products are ideal for the development and validation of novel diagnostic assays and therapeutic treatments.

Visit us online at www.atcc.org/vectorborne to learn more about ATCC products that support reproducible and reliable vector-borne disease research, including additional strains, relevant nucleic acids, and associated products.

Table 1: Mosquito-borne Diseases

ATCC® No.	Organism	Strain Designation	Source Information
<u>VR-1873</u> ™	Bunyamwera virus	Original	Aedes spp. mosquitos caught in Bunyamwera, Uganda
<u>VR-298</u> ™	Cache Valley virus	Original	Culiseta inornata mosquitoes
<u>VR-64</u> ™	Chikungunya virus		Serum of patient, Tanganyika, East Africa, 1953
<u>VR-1960</u> ™	Chikungunya virus	37997	Aedes furcifer, Senegal
<u>VR-1964</u> ™	Chikungunya virus	R95932	Serum of a 62-year-old human male that had travel history to India
<u>VR-3360</u> ™	Chikungunya virus	181/25	Human, Thailand
<u>VR-1586</u> ™	Dengue virus type 1	Strain: TH-S-man (TC adapted)	Pooled serum from 6 patients, Hawaii, 1944
<u>VR-1856</u> ™	Dengue virus type 1	Hawaii	Derived by adaptation of mouse-prepared product
<u>VR-1584</u> ™	Dengue virus type 2	New Guinea C	Serum of febrile patient, New Guinea, 1944
<u>VR-1810</u> ™	Dengue virus type 2	TH-36	Serum from patient diagnosed as Thai hemorrhagic fever, Thailand 1958
<u>VR-1490</u> ™	Dengue virus type 4	H241 (TC adapted)	Clinical specimen - Human, Philippines, 1956
<u>VR-1934</u> ™	Inkoo virus	KN 3641	34 adult female Aedes communis punctor from Finland
VR-74 [™]	Japanese encephalitis virus		Spinal fluid from fatally infected child, Japan
<u>VR-712</u> ™	Jamestown Canyon virus	61V-2235	Animal tissue, Colorado
<u>VR-1834</u> ™	La Crosse virus		Brain tissue from a 4-year-old female, Wisconsin, 1960
<u>VR-1863</u> ™	Mayaro virus	TRVL 15537	
<u>VR-1966</u> ™	Mayaro virus	07-18066-99	Human serum, Peru
30090™	Plasmodium berghei	NK65	Mosquito, Forest Gallery of Kisanga, Katanga, 1965
<u>50175</u> ™	Plasmodium berghei	NK65A	Derived from M. Yoeli strain NK65 by mosquito passage, Univ. Illinois, Urbana, pre-1978
30930™	Plasmodium falciparum	FCR-1/FVO	Adult human male, Vietnam, 1966 (?)
30932™	Plasmodium falciparum	FCR-3/FMG [FCR-3/Gambia)]	Human clinical specimen, Fajara Gambia, 1976
30950™	Plasmodium falciparum	Honduras-1/CDC	Human, Cholutec, Honduras, 1980
30993™	Plasmodium falciparum	FCC-2/Hainan	Infected Human, Hainan Island, China, 1979
<u>50028</u> ™	Plasmodium falciparum	FCR-8/West African	Human, West Africa (?), 1978
<u>50113</u> ™	Plasmodium falciparum	HB-3	Clone of Honduras I/CDC, ATCC 30950, 1983
30075™	Plasmodium fragile	Nilgiri	Macaca radiata, Nilgiri Hills, India 1961
30192™	Plasmodium knowlesi	Malayan	Macaca fascicularis, West Malaysia, 1962
<u>30141</u> ™	Plasmodium relictum	1P and 1P1	Mourning dove, Nebraska, 1937
30138™	Plasmodium vivax	Panama	Human, Panama, 1969

Table 1: Mosquito-borne Diseases (continued)

ATCC® No.	Organism	Strain Designation	Source Information
30151™	Plasmodium vivax	South Vietnam	Human, South Vietnam
30152™	Plasmodium vivax	Sal 1	Human, Cangrejera, La Paz, El Salvador, 1970
30197™	Plasmodium vivax	SALII	Human, Las Guarumas, La Paz, El Salvador, 1970
<u>VR-3345</u> ™	Ross River virus	T-48	Aedes vigilax, Australia
<u>VR-1891</u> ™	Usutu virus	SAAR 1776	Mosquito in Ndumu, Natal, South Africa, 1959
<u>VR-1892</u> ™	Usutu virus	ENT MP 1626	Mosquito in Zika forest, Entebbe area, Uganda, 1962
<u>VR-1507</u> ™	West Nile virus	385-99	Tissue, animal, Bronx New York, USA, 1999
<u>VR-1510</u> ™	West Nile virus	B 956	Human blood, Uganda, 1937
<u>VR-1251</u> ™	Western equine encephalitis virus	Fleming	
<u>VR-84</u> ™	Zika virus	MR 766 (Original)	Blood from experimental forest sentinel rhesus monkey, Uganda 1947
<u>VR-1838</u> ™	Zika virus	MR 766	Blood from experimental forest sentinel rhesus monkey, Uganda 1947
<u>VR-1839</u> ™	Zika virus	IBH 30656	Human blood in Ibadan, Nigeria, 1968
<u>VR-1843</u> ™	Zika virus	PRVABC59	Human serum specimen, Puerto Rico, December 2015
<u>VR-1843HK</u> ™	Heat-inactivated Zika virus	PRVABC59	Human serum specimen, Puerto Rico, December 2015
<u>VR-1844</u> ™	Zika virus	FLR	Human serum, Columbia, December 2015
<u>VR-1845</u> ™	Zika virus	P6-740	Aedes aegypti, Malaysia, July 1966
<u>VR-1848</u> ™	Zika virus	R103451	Placenta of a human isolated on January 6, 2016 infected from travel to Honduras in 2015
<u>VR-1859</u> ™	Zika virus	H/PAN/2015/CDC-259359	Panamanian isolate, 2015
VR-1860 [™]	Zika virus	H/PAN/2015/CDC-259364	Panamanian isolate, 2015
<u>VR-1868</u> ™	Zika virus	R116265	Human serum specimen, Mexico, June 2016
ATCC® No.	Product Description		
VR-1864™	Monoclonal Anti-Zika virus envelope (E) protein Clone ZV-2 (produced <i>in vitro</i>)		
<u>PRA-405D</u> ™	Genomic DNA from Plasmodiu	m falciparum strain 3D7 [ATCC®	® PRA-405™]
<u>VR-3246SD</u> ™	Quantitative Synthetic Chikur	ngunya virus (CHIKV) RNA	
<u>VR-3228SD</u> ™	Quantitative Synthetic Dengu	e virus type 1 RNA	
<u>VR-3229SD</u> ™	Quantitative Synthetic Dengu	e virus type 2 RNA	
<u>VR-3230SD</u> ™	Quantitative Synthetic Dengu	e virus type 3 RNA	
<u>VR-3231SD</u> ™	Quantitative Synthetic Dengu	e virus type 4 RNA	
<u>VR-3239SD</u> ™	Quantitative Synthetic Easter	n equine encephalitis virus RNA	
<u>VR-3254SD</u> ™	Quantitative Synthetic Rift Va	Illey fever virus DNA	
<u>VR-3236SD</u> ™	Quantitative Synthetic Saint L	ouis encephalitis virus RNA	
VR-3198SD™	Quantitative Synthetic West N	Nile Virus RNA	
<u>VR-3253SD</u> ™	Quantitative Synthetic Yellow fever virus RNA		
<u>VR-1838DQ</u> ™	Quantitative Genomic RNA from Zika virus strain MR 766 [ATCC® VR-1838™]		
<u>VR-1843DQ</u> ™	Quantitative Genomic RNA from Zika virus strain PRVABC59 [ATCC® VR-1843™]		
	Quantitative Synthetic Zika virus (ZIKV) RNA		
VR-3252SD™	Quantitative Synthetic Zika vi	rus (ZIKV) RINA	

Table 2: Tick-borne Diseases

ATCC® No.	Organism	Strain Designation	Isolation Source
<u>VR-1436</u> ™	Anaplasma marginale	South Idaho, USA (S64-Id2AM)	Whole blood from a naturally infected 13 year old Hereford cow from south-central Idaho herd, USA
VR-1437™	Anaplasma ovis	Idaho, USA (S65-Id1AO)	Blood from Ovies aries (domestic sheep)
PRA-302™	Babesia duncani	WA1	Human blood, Washington State, 1991
30221™	Babesia microti	Gray	Human, Nantucket Island, MA, 1970
PRA-99™	Babesia microti	Peabody mjr	Human blood, Nantucket Island, Massachusetts, USA, 1973
PRA-398 [™]	Babesia microti	GI (Ingram strain)	Blood, human babesiosis, Nantucket, MA, 1983
PRA-399™	Babesia microti	Nan-Hs-2011 (N11-50)	Blood, human babesiosis, Nantucket, MA, 2010
PRA-400™	Babesia microti	Naushon	Tick (Ixodes scapularis), Naushon Island, MA, 1986
PRA-401 [™]	Babesia microti	Lab Strain 1	Mouse blood, Greenwich, CT, 2004
51992™	Borrelia afzelii	BO23	Human skin, Germany
BAA-2496 [™]	Borrelia bavariensis	PBi	Human cerebrospinal fluid
35210™	Borrelia burgdorferi	B31	Tick, Ixodes dammini, New York
35211™	Borrelia burgdorferi	IRS	Tick, Ixodes ricinus, Switzerland
51990 <u>™</u>	Borrelia burgdorferi	MM1	White footed mouse, Peromyscus leucopus, Minnesota, USA
53899™	Borrelia burgdorferi	297	Cerebrospinal fluid
55131 [™]	Borrelia burgdorferi	HB19M	Human blood, Belgium
<u>+3381</u> ™	Borrelia coriaceae	Co53 [CIP 104208T]	Soft tick, <i>Ornithodoros coriaceus</i> , California
51383™	Borrelia garinii	CIP 103362	Tick, Ixodes ricinus, France
51991™	Borrelia garinii	Fuji P1	Ixodes persulatus, Mt. Fuji, Japan
/R-1842™	Bourbon virus	Original	Human male with tick exposure in Bourbon County, Kanasas, 201
/R-1933™	Heartland virus	MO-4	Human leukocytes, Missouri, 2009
/R-1262™	Powassan virus	Byers	Presumed from brain of human patient, Canada, 1958
/R-1954™	Powassan virus	R59266	Brain of a human male in Canada
/R-1957™	Powassan virus	T18-23-81	Tick (Ixodes cookei) on Marmota spp. in Ontario, Canada
/R-1958™	Powassan virus	WI-SPO	Salivary gland of a female deer tick in Spooner, Wisconsin
/R-1593™	Rickettsia asiatica	10-1	Fukushima, Japan
/R-1814 [™]	Rickettsia buchneri	ISO-7	Ovarian tissue of female <i>Ixodes scapularis</i> , 2007
/R-610 [™]	Rickettsia canadensis	2678	Haemaphysalis leporispalustris (whole ticks)
/R-1444 [™]	Rickettsia canadensis	CA410	Haemaphysalis leporispalustris in California, USA
VR-613 [™]	Rickettsia conorii	7 [7]	<i>Ornithodoros moubata</i> ticks. Received by Rocky Mountain Lab in 1946
√R-1472 [™]	Rickettsia honei	RB	Human with fever and rash, Australia, originally isolated on Verocells
/R-1363™	Rickettsia japonica	YH	Blood of patient with oriental spotted fever, Japan
/R-1376™	Rickettsia massiliae	Mtul [strain Mtu1]	Hemolymph of Rhipicephalus turanicus from the South of France
/R-1928™	Rickettsia monacensis	IrR/Munich	Tick (Ixodes ricinus), Munich, Germany, 1998
VR-1637 [™]	Rickettsia parkeri	Maculatum C	
ATCC® No.	Product Description		
35210D-5 [™]	Genomic DNA from Borreli	ia burgdorferi Strain B31 [ATCC® 35210	^{[M}]
30221D™	Quantitated Genomic DNA from <i>Babesia microti</i> strain Gray [ATCC® 30221™]		
35210DQ™	Quantitative Genomic DNA from Borrelia burgdorferi		

LYME DISEASE RESEARCH TOOLS

Lyme disease, also known as Lyme borreliosis, is a tick-borne disease caused by *Borrelia* spirochetes. If left untreated, Lyme disease can result in arthritis, neurological symptoms, and heart problems. To help support research on this disease, ATCC offers *Borrelia* strains representing the three species most frequently associated with Lyme disease in the United States and Europe – *B. burgdorferi*, *B. afzelii*, and *B. garinii*. To view a full listing of these strains, visit ATCC online at www.atcc.org/vectorborne.



Table 3: Kissing Bug-borne Diseases

ATCC® No.	Organism	Strain Designation	Isolation Source
<u>30028</u> ™	Trypanosoma conorrhini		Kissing bug, <i>Triatoma rubrofasciata</i> , Oahu Island, HI, 1947
30537™	Trypanosoma conorrhini	Singapore	Kissing bug, <i>Triatoma rubrofasciata</i> , Singapore, Malaysia, 1969
30803™	Trypanosoma conorrhini	77244	Adult kissing bug, <i>Triatoma rubrofasciata</i> , Manila, Philippines, 1977
30013™	Trypanosoma cruzi	Culbertson	Human, Brazil, 1926
30160™	Trypanosoma cruzi	Corpus Christi	10-month-old girl, Corpus Christi, TX, 1955
30161™	Trypanosoma cruzi	Houston	6-month-old boy, Houston, TX, 1955
<u>50791</u> ™	Trypanosoma cruzi	M/HOM/AR/74/CA-I CL72	Clone 72 Derived from strain CA-I, originally isolated from a Human male with chronic myocarditis, San Luis Province, Argentina, 1974, Cloned by J. Dvorak, 1980
<u>50792</u> ™	Trypanosoma cruzi	M/HOM/BR/68/CAN III CL1	Human male, Brazil, 1968, Cloned by M. Miles, 1968
<u>50795</u> ™	Trypanosoma cruzi	M/HOM/AR/80/MIRANDA CL83	Human male, Argentina, 1980, Cloned by J. Dvorak, 1980
<u>50820</u> ™	Trypanosoma cruzi	ESMERALDO CL2	Clone 2 Derived from strain Esmeraldo which was originally isolated by xenodiagnosis from an acute case of Chagas' disease in a Human male from northeastern Brazil, 1977, Cloned by M. Miles
<u>50823</u> ™	Trypanosoma cruzi	SYLVIO-X10	Obtained from the fifth instar of <i>Rhodnius prolixus</i> used for xenodiagnosis of an acute case of slyvatic-Derived Chagas' disease, Para, Brazil, 1978
<u>50829</u> ™	Trypanosoma cruzi	TULAHUEN CL98	Clone 98 Derived from the Tulahuen strain, 1980
<u>50830</u> ™	Trypanosoma cruzi	WA250 CL1	Clone 1 Derived from strain WA-250 which was originally isolated from an opposum, <i>Didelphis albiventris</i> , 1977
50832™	Trypanosoma cruzi	Υ	Chagas' disease patient, Belo Horizonte, Brazil, 1953
<u>50834</u> ™	Trypanosoma cruzi	CA-I CL72 Lampit Resistant	Lampit (=Nifurtimox) resistant strain Derived from CA-I CL72 (=ATCC 50791)
50832GFP™	Trypanosoma cruzi	Y GFP CL1	ATCC 50832 transfected with GFP
<u>30282</u> ™	Trypanosoma cyclops	7549	Monkey, <i>Macaca nemestrina</i> , West Malaysia, 1969
30032™	Trypanosoma rangeli	Venezuelan E1 Tocuyo	Human, Venezuela, 1956
ATCC® No.	Product Description		
30266D™	Genomic DNA from <i>Trypano</i>	osoma cruzi strain Tulahuen [ATCC®]	30266™]
50823D™	Genomic DNA from Trypano	osoma cruzi strain SYLVIO-X10 [ATCC	[©] 50823™]

Table 4: Sand Fly-borne Diseases

ATCC® No.	Organism	Strain Designation	Isolation Source
PRA-417 [™]	Leishmania aethiopica	MHOM/ET/72/L100 GFP	Transfected with GFP. Strain MHOM/ET/72/L100 was originally isolated from a human, Ethiopia, 1972
<u>50135</u> ™	Leishmania braziliensis	MHOM/BR/75/M2903	Human, Serra das Carajas, Para, Brazil, 1975
<u>50133</u> ™	Leishmania chagasi	MHOM/BR/74/PP75	Child, Ituacu, Bahia, Brazil, 1974
30030™	Leishmania donovani	Khartoum	Human, Sudan, 1959
<u>50212</u> ™	Leishmania donovani	MHOM/IN/80/DD8	Bone marrow of 9-year-old Indian male, Bihar, India, 1980
<u>PRA-413</u> ™	Leishmania donovani	AG83 [MHOM/IN/1983/AG83]	Bone marrow aspirate, Kala-azar patient, India, 1983
<u>50134</u> ™	Leishmania infantum	MHOM/TN/80/IPT-1	Child, Monastir, Tunisia, 1980
<u>50918</u> ™	Leishmania infantum	LIVT-2	Popliteal lymph node of a foxhound, Virginia
<u>30012</u> ™	Leishmania major		Human, Teheran, Iran, 1949
<u>50155</u> ™	Leishmania major	MHOM/SU/73/5-ASKH	Human, Askhabad, Turkmenskaya, USSR, 1973
<u>PRA-384</u> ™	Leishmania major	MHOM/SN/74/SD	Cutaneous leishmaniasis, Senegal, 1973
30031™	Leishmania mexicana	Guatemalan	Human, Guatemala, 1948
<u>50156</u> ™	Leishmania mexicana	MNYC/BZ/62/M379	Nyctomys sumichrasti, Cayo District, Belize, 1962.
<u>50157</u> ™	Leishmania mexicana	MHOM/BZ/82/BEL21	Human, Cayo District, Belize, 1982
<u>PRA-416</u> ™	Leishmania mexicana	MNYC/BZ/62/M379 GFP	Transfected with GFP. Strain MNYC/BZ/62/M379 was originally isolated from a Sumichrast's vesper rat, Cayo District, Belize, 1962
<u>50158</u> ™	Leishmania panamensis	MHOM/PA/71/LS94	
<u>50129</u> ™	Leishmania tropica	MHOM/SU/74/K27	Human, Baku, Azerbaidjanskaya, USSR, 1974
<u>VR-1756</u> ™	Sandfly fever Sicilian virus		

ATCC® No.	Product Description	
<u>35685D-5</u> ™	Genomic DNA from <i>Bartonella bacilliformis</i> strain KC583 [ATCC® <u>35685</u> ™]	
<u>30030D</u> ™	Genomic DNA from <i>Leishmania donovani</i> strain Khartoum [ATCC® <u>30030</u> ™]	
<u>50134D</u> ™	Genomic DNA from <i>Leishmania infantum</i> strain MHOM/TN/80/IPT-1 [ATCC® <u>50134</u> ™]	
30012D™	Genomic DNA from <i>Leishmania major</i> [ATCC® <u>30012</u> ™]	
<u>50129D</u> ™	Genomic DNA from <i>Leishmania tropica</i> MHOM/SU/74/K27 [ATCC [®] <u>50129</u> ™]	
MP-13™	Leishmania Genomic DNA Panel	

Table 5: Tsetse Fly-borne Diseases

ATCC® No.	Organism	Strain Designation	Isolation Source
PRA-380 [™]	Trypanosoma brucei	Lister 427 procyclic form	Unknown; possibly Derived from s427 strain, Uganda, 1960
30026™	Trypanosoma brucei gambiense	Cheich	Human, Dakar, 1950
<u>30024</u> ™	Trypanosoma brucei rhodesiense	Wellcome CT	Human blood, Tinde, Tanganyika, 1934
<u>PRA-406</u> ™	Trypanosoma brucei rhodesiense	KETRI 243	Human clinical isolate, Busoga, Uganda, 1961
<u>PRA-407</u> ™	Trypanosoma brucei rhodesiense	KETRI 269	Human clinical isolate, Kitanga, Tanzania, 1960
<u>PRA-408</u> ™	Trypanosoma brucei rhodesiense	KETRI 2538	Human clinical isolate, Tete Province, Mozambique, 1980
ATCC® No.	Product Description		
<u>PRA-377D</u> ™	Genomic DNA from <i>Trypanosoma brucei</i> brucei strain TREU 927/4 (GUTat 10.1) [ATCC [®] <u>PRA-377</u> ™]		

Table 6: Flea-, Lice-, Gnat-, and Mite-borne Diseases

ATCC® No.	Organism	Strain Designation	Isolation Source
<u>51734</u> ™	Bartonella clarridgeiae	[Houston-2 cat]	Animal blood, Houston Texas, USA
<u>700095</u> ™	Bartonella clarridgeiae	NCSU 94-F40	Animal blood, blood of cat implicated in a case of cat scratch disease, North Carolina, USA
<u>49927</u> ™	Bartonella elizabethae	F9251 [B91-002005]	Human blood, Brighton, Massachusetts, USA
<u>49793</u> ™	Bartonella henselae	87-66	Blood of a 31-year-old male with AIDS, Oklahoma City, OK, USA
<u>49882</u> ™	Bartonella henselae	Houston-1 [CIP 103737, G5436]	Human blood from an HIV-positive male, Houston Texas, USA
<u>700693</u> ™	Bartonella koehlerae	C-29	Animal blood, California, USA
<u>51694</u> ™	Bartonella quintana	90-268	Human blood, Oklahoma City, Oklahoma, USA
<u>BAA-1498</u> ™	Bartonella rochalimae	BMGH	43-year-old woman with splenomegaly, fever, anemia, and recent travel to Peru, September 5, 2003
<u>BAA-1343</u> ™	Bartonella tamiae	Th239	Febrile patient in Thailand, June, 2004
<u>51672</u> ™	Bartonella vinsonii	NCSU 93-CO1	Domestic dog with endocarditis, North Carolina
<u>700727</u> ™	Bartonella vinsonii	OK 94-513	Human blood, Jackson Wyoming, USA, 1994
BAA-1342 [™]	Bartonella washoensis subsp. cynomysii	CL8606co	Prairie dog
<u>VR-1896</u> ™	Epizootic hemorrhagic disease virus 1	OV202	Asymptomatic, farmed white-tailed deer, Gadsden County, Florida, USA. Isolated on September 22, 2015.
<u>VR-1897</u> ™	Epizootic hemorrhagic disease virus 2	OV215	Spleen of a farmed white-tailed deer, Gadsden County, Florida, USA, 2016
<u>VR-609</u> ™	Orientia tsutsugamushi	Scrub typhus strain Kato	Blood of patient in Niigata Pref., Japan
<u>VR-148</u> ™	Rickettsia akari	MK (Kaplan)	Blood from patient, New York City, 1946
30085™	Trypanosoma lewisi	New Orleans-67	Rat, Rattus norvegicus, New Orleans, 1967
30182™	Trypanosoma musculi	L (Lincicome)	Mouse, Mus sp., USA, (?)

ATCC® No.	Product Description
49882D-5 [™]	Genomic DNA from <i>Bartonella henselae</i> strain Houston-1 [ATCC [®] <u>49882</u> ™]
<u>BAA-1505D-5</u> ™	Genomic DNA from Yersinia pestis strain TS
<u>BAA-1506D-5</u> ™	Genomic DNA from Yersinia pestis strain A12
<u>BAA-1504D-5</u> ™	Genomic DNA from Yersinia pestis strain Kim
30022D™	Genomic DNA from <i>Trypanosoma lewisi</i> strain Lincicome [ATCC [®] <u>30022</u> ™]

Some of the strains referenced in this guide are not available for international distribution. Visit us online at www.atcc.org to check the availability of specific strains in certain geographical areas. Though each of the following species has been shown to cause vector-borne disease in humans, ATCC has not tested individual strains for pathogenicity.

REFERENCES

- 1 World Health Organization. Vector-borne diseases Fact Sheet. http://www.who.int/mediacentre/factsheets/fs387/en/, February 2016.
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- 4 Centers for Disease Control and Prevention. Parasites African Trypanosomiasis (also known as Sleeping Sickness). http://www.cdc.gov/parasites/sleepingsickness/, August 2012.





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VB-072024-v10

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