

Powassan Virus, T18-23-81

Catalog No. NR-51183

For research use only. Not for use in humans.

Contributor:

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Manufacturer:

BEI Resources

Product Description:

Virus Classification: *Flaviviridae*, *Flavivirus*

Species: Powassan Virus

Strain/Isolate: T18-23-81

Original Source: Powassan virus (POWV), T18-23-81 was isolated from the environment from a tick (*Ixodes cookei*) on *Marmota* spp. on July 25, 1981, in Ontario, Canada.¹

Comments: The original submission of POWV, T18-23-81 was received in SMB and passaged three times in Vero cells to adapt the virus to cell culture.¹ The NS5 protein gene of POWV, T18-23-81 has been sequenced (GenBank: [AF310943](#)).²

POWV is the sole recognized North American member of the tick-borne encephalitis serological complex of the flaviviruses.³ It is transmitted to small- and medium-sized mammals by *Ixodes scapularis*, *Ixodes cookei* and several other *Ixodes* tick species.^{4,5} POWV infects humans during spillover transmission from the natural transmission cycles causing a rare but severe neuroinvasive disease, with 50% of survivors displaying long-term neurological sequelae. Genomic sequencing demonstrates that POWV consists of two distinct genetic lineages, which may be defined by geographical and host associations.^{4,5} Lineage I, which is the POWV prototype lineage, is maintained predominantly by *Ixodes cookei* and shows a high level of conservation in nucleotide and amino acid sequences over time. Lineage II, which consists of deer tick virus (DTV), is maintained by *Ixodes scapularis*.^{4,5} Serological studies support a close relationship between POWV and DTV, with cross-neutralization studies showing that they are indistinguishable serologically.³

Material Provided:

Each vial contains approximately 1.0 mL of cell lysate and supernatant from *Chlorocebus* (formerly *Cercopithecus*) *aethiops* kidney epithelial cells infected with POWV, T18-23-81.

Note: If homogeneity is required for your intended use, please purify prior to initiating work.

Packaging/Storage:

NR-51183 was packaged aseptically in screw-capped plastic

cryovials. The product is provided frozen and should be stored at -60°C or colder immediately upon arrival. For long-term storage, the vapor phase of a liquid nitrogen freezer is recommended. Freeze-thaw cycles should be avoided.

Growth Conditions:

Host: *Chlorocebus* (formerly *Cercopithecus*) *aethiops* kidney epithelial cells (Vero; ATCC® CCL-81™)

Growth Medium: Eagle's Minimum Essential Medium containing Earle's Balanced Salt Solution, non-essential amino acids, 2 mM L-glutamine, 1 mM sodium pyruvate and 1.5 g/L of sodium bicarbonate supplemented with 2% fetal bovine serum, or equivalent

Infection: Cells should be 60% to 80% confluent

Incubation: 6 to 10 days at 37°C and 5% CO₂

Cytopathic Effect: Cell rounding and sloughing

Citation:

Acknowledgment for publications should read "The following reagent was obtained through BEI Resources, NIAID, NIH: Powassan Virus, T18-23-81, NR-51183."

Biosafety Level: 3

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the following publication: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health. [Biosafety in Microbiological and Biomedical Laboratories \(BMBL\)](#). 6th ed. Washington, DC: U.S. Government Printing Office, 2020.

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References:

1. Russell, B., Personal Communication.
2. Mandl, C. W., et al. "Complete Genomic Sequence of Powassan Virus: Evaluation of Genetic Elements in Tick-Borne Versus Mosquito-Borne Flaviviruses." Virology 194 (1993): 173-184. PubMed: 8097605.
3. Ebel, G. D. "Update on Powassan Virus: Emergence of a North American Tick-Borne Flavivirus." Annu. Rev. Entomol. 55 (2010): 95-110. PubMed: 19961325.
4. Hermance, M. E. and S. Thangamani. "Powassan Virus: An Emerging Arbovirus of Public Health Concern in North America." Vector Borne Zoonotic Dis. 17 (2017): 453-462. PubMed: 28498740.
5. Ebel, G. D., A. Spielman and S. R. Telford 3rd. "Phylogeny of North American Powassan Virus." J. Gen. Virol. 82 (2001): 1657-1665. PubMed: 11413377.

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