TECHNICAL INFO: Detection of IgG and IgM Antibodies to Powassan

Method / Test type	**ELISA / Qualitative**
Sample	**Human Serum or Plasma**
Sample volume	**1 ml**
Min. volume accepted	**0.2 ml**
Sample collection	**Serum or plasma collected according to standard laboratory practices and shipped in pour off tubes**
Shipping	**Ship frozen, for next-day delivery.**
Stability	**60 days at -20°C (Frozen)**
Rejection criteria	**Sample that is not serum or plasma.** **Clearly contaminated sample – bacterial, fungal, foreign objects.** **Sample arriving outside of stability.**
Reportable/Ref. range	**Positive or Negative. Negative is normal.** **Positive IgM result is indicative of active infection** **Positive IgG result is indicative of past / waning infection**
Reporting time	**3 days (from lab receipt)**
Significance	**Powassan virus (POWV) also known as deer tick virus, is an emerging tickborne flavivirus transmitted by *Ixodes scapularis* ticks. These ticks are also the primary vector of the Lyme disease-causing spirochaete, *Borrelia burgdorferi*. In POWV-endemic regions, up to 7% of ticks carry the virus, and seroprevalence among local small mammalian hosts can exceed 90%.** **POWV is becoming an increasing risk in the US due to the expanding territory of *I. scapularis* and hence expansion of regions considered endemic for POWV.** **The seroprevalence of POWV in humans in some regions of US is known, ranging from 0.5% to 3.3%, but with expanding geographic distribution the seroprevalence of most at-risk populations is unknown.** **Detection of POWV is typically by an IgM antibody capture ELISA or an IgM immunofluorescence antibody (IFA) assay. Cases are confirmed by ≥90% or ≥50% plaque reduction neutralization test (PRNT90 or PRNT50), detection of virus-specific nucleic acids, isolation in culture, or a ≥4-fold increase in antibody titers from paired acute and convalescent sera. And using these assays, clinicians have identified ~100 cases of POWV encephalitis; although the actual incidence is assumed much higher, based on Lyme infections rates.**
Test specifics	**The microtiter assay uses break-off reagent wells coated with recombinant Powassan virus antigens. In the first reaction step, diluted patient samples are incubated in the antigen-coated wells. Positive serum (or plasma)**

	samplescontaining Powassan specific IgM and IgG antibodies will bind to the antigen-coated well. And to detect bound antibodies, a second incubation using an enzyme-labelled anti-human IgM or IgG (enzyme conjugate) is set up. To quantify / call the bound enzyme complex catalyzes a color reaction which is measured spectrophotometrically. **Results can be evaluated qualitatively or semi-quantitatively by calculating a ratio of the extinction of the control or patient sample over the extinction of calibrator. Use the following formula to calculate the ratio:** **Extinction of the control or patient sample = Ratio** **Extinction of calibrator** **Interpretation of results is as follows:** **Ratio <0.8: negative** **Ratio 0.8 to <1.1: borderline** **Ratio >1.1: positive**