Diagnostic and sample submission considerations for California serogroup viruses

California serogroup viruses (CSGVs) are encephalitic mosquito-borne pathogens that circulate across Canada. Cases and seroprevalance rates of 20-30% have been documented from coast to coast including northern regions of the country such as the Yukon and North West Territories. It is recommended that these arboviruses be included as part of the differential, along with West Nile virus, for neurological case investigations that occur during the active mosquito season. The NML currently tests for the two most prevalent CSGVs, Jamestown Canyon and Snowshoe Hare viruses.

Take home message: Paired sera collected ≥14 days apart or both serum and CSF samples should be collected for CSGV serology. Priority should be placed on testing patients with neurological illness. RT-PCR on serum or CSF is **not** a sensitive test for these viruses and will only be considered during the active mosquito season.

California serogroup virus testing

During the 2018 mosquito season, the NML received predominately single serum samples for CSGV serology testing. Given the difficulty in interpreting results from a single serum sample due to the possible persistence of IgM antibodies and the high seroprevalence associated with these viruses in the Canadian population, the NML will no longer accept single serum samples for CSGV serology testing unless also accompanied by a CSF sample (see below).

The following samples will be accepted for CSGV serology:

- Paired serum samples (acute and convalescent) collected 2-3 weeks apart from patients with clinical illness.
- A serum and CSF sample from patients with clinical illness.
- A minimum of 250 µl of serum must be submitted as multiple tests are required for CSGV serological testing. An additional 250 µl of serum is required for molecular detection.
- A minimum volume of 500 µl of CSF is required for serological testing. An additional 250 µl of CSF is required for molecular detection.

The detection of IgM in CSF by in-house ELISA and the detection of CSGV-specific neutralizing antibodies by PRNT in CSF is considered evidence of viral association with current illness (CDC arbovirus case definition).

Please note that RT-PCR on serum or CSF is not a sensitive test for the CSGVs and will only be performed under special circumstances. The NML will determine if molecular testing is feasible after serological testing is complete.

Serum samples positive for CSGV-specific IgM will be tested by the confirmatory Plaque Reduction Neutralisation Test (PRNT) to detect CSG-specific neutralizing antibodies.