



SERION ELISA *classic*

West Nile Virus IgG and IgM

Dear Ladies and Gentlemen,

Increasing West Nile Virus Infections in Europe

With this newsletter we would like to inform you about our SERION ELISA *classic* West Nile Virus IgG and IgM test systems. Especially in regards to the current situation where increased incidences of West Nile Virus infections have been recorded, a rapid and efficient diagnosis is of particular. Up to the end of October 2018 1463 cases (including 550 cases in Italy, 307 cases in Greece, over 200 cases in Romania and Hungary each) have been reported within the EU. Compared to the 200 reported cases within the EU in 2017, an increase of infections with West Nile Virus for 2018 is evident [1].

The West Nile Virus is a RNA virus and belongs to the *flaviviridae*. It is one of the most widely distributed arboviruses and is transmitted via different mosquito types (e.g. genus *Culex*) to birds, which serve as pathogen reservoir as well as to human and other mammals [2].

The incubation period is approximately 2-15 days and the majority of infections are asymptomatic. In approximately 20% of cases flu-like symptoms like fever, head ache, muscle and joint pain occur. In rare cases a severe disease course can develop with meningitis, encephalitis or paralysis.

Support of diagnosis with SERION ELISA *classic*

To support the diagnosis of West Nile Virus infections, institute Virion\Serion GmbH provides SERION ELISA *classic* West Nile Virus IgG and IgM tests. These are qualitative and quantitative immuno assays for the detection of human antibodies in serum and plasma against West Nile Virus. SERION ELISA *classic* West Nile Virus IgM is suited to the sensitive detection of acute infections and is based on a preparation of inactivated West Nile Virus. For SERION ELISA *classic* West Nile Virus IgG a polypeptide of the premembrane protein M and a preparation of DIII of the envelope protein E are used as antigen. SERION ELISA *classic* West Nile Virus IgG can be used for confirmation of pathogen contact, for immune status determination and to support epidemiologic studies.

Proven high specificity and low incidence of cross reactivity

The specific antigen composition of SERION ELISA *classic* West Nile Virus IgG minimizes of potential cross reactivities, which can occur within the flaviviruses (e.g. Dengue Virus). To demonstrate the high diagnostic performance of SERION ELISA *classic* West Nile Virus IgG and IgM, internal cross reactivity studies have been performed.

To evaluate cross reactive antibodies, different sera have been analyzed with SERION ELISA *classic* West Nile Virus IgG and a commercially available anti-West Nile Virus IgG ELISA.

Positive tested for:	Number of sera	Potential cross reactivity with SERION ELISA <i>classic</i> West Nile Virus IgG
Cytomegalovirus IgG	10	none
Dengue Virus IgG	10	1
TBE Virus IgG	10	1
EBV VCA IgG	10	none
HSV 1 IgG	10	none
Measles Virus IgG	10	none
Mumps Virus IgG	10	none
Mycoplasma pn. IgG	10	none
Rubella Virus IgG	10	none
Varicella Zoster Virus IgG	10	none
ANA	10	none
RF	10	1

The analysis shows that only minor cross reactivities are evident with the SERION ELISA *classic* West Nile Virus IgG test. In particular with other flaviviruses like Dengue Virus and TBE Virus cross reactivities need to be avoided to ensure adequate test specificity. To evaluate the performance of SERION ELISA *classic* West Nile Virus IgG with the West Nile Virus IgG assay of another manufacturer, the cross reactivity study has been additionally performed in parallel with a reference test. The West Nile Virus IgG reference test showed for all ten Dengue Virus IgG and for five TBE Virus IgG sera a positive result and therefore a potential cross reactivity.

Positive tested for:	Number of Sera	Potential cross reactivity with SERION ELISA <i>classic</i> West Nile Virus IgG	Potential cross reactivity with West Nile Virus IgG test of another manufacturer
Dengue Virus IgG	10	1	10
TBE Virus IgG	10	1	5

These evaluations demonstrate the high specificity of the SERION ELISA *classic* West Nile Virus IgG and that only minor cross reactivities to antibodies directed against other flaviviruses (here: Dengue Virus and TBE Virus) have been observed.

Analogous to the SERION ELISA *classic* West Nile Virus IgG a cross reactivity study has also been performed for the West Nile Virus IgM test. Within the internal analysis almost no potential cross reactivity with SERION ELISA *classic* West Nile Virus IgM has been observed. Although other cross reactivities cannot be ruled out in general, the present evaluation shows a very good specificity of SERION ELISA *classic* West Nile Virus assays.

Positive tested for:	Number of sera	Potential cross reactivity with SERION ELISA <i>classic</i> West Nile Virus IgM
Cytomegalovirus IgM	10	none
Dengue Virus IgM	10	none
TBE Virus IgM	10	none
EBV VCA IgM	10	none
HSV 1 IgM	10	none
Measles Virus IgM	10	1
Mumps Virus IgM	10	none
Rubella Virus IgM	10	none
Varizella Zoster Virus IgM	10	none
ANA	10	none
RF	10	none

High diagnostic efficiency

To determine the sensitivity of SERION ELISA *classic* West Nile Virus IgG, 30 samples of patients with suspected West Nile Virus infection have been analyzed in comparison to two reference test systems. The specificity of SERION ELISA *classic* West Nile Virus IgG has been determined by analyzing 69 healthy blood donors from Southern Germany in comparison to two reference test systems. For evaluating the performance characteristics of SERION ELISA *classic* West Nile Virus IgM, 103 negative sera of healthy blood donors (specificity) have been analyzed as well as 30 samples of patients with suspected West Nile Virus infection (sensitivity), which have been pretested with positive results in two reference test systems.

	Sensitivity	Specificity
SERION ELISA <i>classic</i> West Nile Virus IgG	92.6 %	96.6 %
SERION ELISA <i>classic</i> West Nile Virus IgM	>99 %	>99 %



„Regional Reference Center for Microbiological Emergencies“

External study at the University of Bologna

Additionally an external study at the „Regional Reference Center for Microbiological Emergencies“ at the University of Bologna has been carried out for SERION ELISA *classic* West Nile Virus IgG and IgM assays. By showing a good correlation of the results with an in house Micro Neutralization Assay, the high diagnostic efficiency of the ELISA tests could be demonstrated. The results show that SERION ELISA *classic* West Nile Virus tests combine appropriate sensitivity with a highly reduced detection rate of cross reactive antibodies. The tests are recommended as valuable diagnostic tool for the detection of West Nile Virus infections. The complete study report can be provided upon request.

We hope that we could convince you about the good diagnostic performance of our SERION ELISA *classic* West Nile Virus tests. If you have any questions or comments please feel free to contact us any time. We will be pleased to inform you about our extensive product portfolio for infectious disease serology and will be available for you as reliable partner and manufacturer for our *in vitro* diagnostic products also in the future.

**With best regards,
Institut Virion\Serion GmbH**

[1] ProMED Mail (message from 8th of Nov 2018) <https://www.promedmail.org/>

[2] Microbiologic-Infectiologic quality standards 2016