

# SERION Avidity Reagents for avidity determination of IgG antibodies

SERION ELISA *classic* Avidity Reagents are complementary components which, in combination with the corresponding SERION ELISA *classic*, enables the avidity of pathogen specific IgG antibodies to be determined. The SERION ELISA *classic* Avidity Reagents are recommended to aid the differentiation between acute primary infections and previous infections by Cytomegalovirus, Rubella Virus or *Toxoplasma gondii*, particularly in serological investigation during pregnancy.

## Diagnostic Background

Avidity characterises the average affinity of specific polyclonal antibodies of an individual formed during the normal course of an infection. Avidity testing is based on the observation, that antibody affinities increase significantly as the immune response to pathogens progresses (affinity maturation). Therefore, highly avid IgG antibodies are an indicator of previous infection whereas IgG antibodies with low avidity are suggestive of a primary infection. Consequently, the determination of high antibody avidities in general excludes acute primary infections. Particularly during pregnancy, avidity testing of certain pathogen specific IgG antibodies is a valuable contribution to routine serology.

Primary infection of pregnant women caused by Cytomegalovirus, Rubella Virus or by *Toxoplasma gondii* are a major cause of congenital damage. Determination of IgM antibodies should not be considered conclusive proof of a primary infection as pathogen-specific IgM antibodies may also arise from polyclonal stimulation, reinfection or reactivation. Determination of IgG antibody avidity provides therefore a valuable contribution towards the differentiation between acute primary and previous infections.

## SERION Avidity Reagents

Avidity determination with SERION Avidity Reagents is performed using the appropriate SERION ELISA *classic* tests and based on the degradation of the interaction between antibodies and antigens. SERION Avidity Reagents cause the dissociation of low affinity antibody-antigen complexes, whereas high affinity complexes are not affected.

The gold standard for avidity determination is the end-point titration method, which, due to the technical complexity involved is rarely used in routine laboratories. The simpler single-point method, in which a quotient of OD values is calculated of cavities with and without avidity reagent, can lead to false avidity indices due to the variable antibody content of serum samples. As a consequence of the competition between high and low affinity antibodies for the same binding sites on the coated microtiter plates, the concentration of antigen specific antibodies in the serum sample has a significant effect on the avidity indices obtained. Therefore, commercially available avidity tests frequently use the method of expressing the avidity index as a quotient of IgG antibody titers in order to compensate for the effect of variable antibody concentrations.

Determination of SERION avidity indices is performed on a special evaluation method based on measured signal intensities, but taking into account the pathogen specific antibody concentration in order to compensate for the influence of antibody content on the avidity index. A comparison of the SERION evaluation technique with quantification methods of other manufacturers, which are based on quotients of measured antibody concentrations with and without avidity reagent, showed better intra- and interserial precision profiles with lower coefficients of variation with the SERION method. Furthermore, high lot-to-lot consistency is guaranteed.

## Software SERION *avidity*

For calculation of SERION avidity indices and determination of high or low avidity, the free-of-charge Excel-based evaluation software tool SERION *avidity* is available on request.

|   | Order no. |
|---|-----------|
| SERION ELISA <i>classic</i> Cytomegalovirus IgG               | ESR109G   |
| SERION ELISA <i>classic</i> Cytomegalovirus Avidity Reagent   | B109AVID  |
| SERION ELISA <i>avidity control</i> Cytomegalovirus IgG       | BR109AVID |
| SERION ELISA <i>classic</i> Rubella Virus IgG                 | ESR129G   |
| SERION ELISA <i>classic</i> Rubella Virus Avidity Reagent     | B129AVID  |
| SERION ELISA <i>avidity control</i> Rubella Virus IgG         | BR129AVID |
| SERION ELISA <i>classic</i> Toxoplasma gondii IgG             | ESR110G   |
| SERION ELISA <i>classic</i> Toxoplasma gondii Avidity Reagent | B110AVID  |
| SERION ELISA <i>avidity control</i> Toxoplasma gondii IgG     | BR110AVID |
| Software SERION <i>avidity</i>                                |           |

Normal IgG determination in parallel with avidity testing is possible.

Avidity testing is evaluated for manual use as well as for processing on Immunomat™ and comparable automates.

The Excel-based Software SERION *avidity* is available on demand free of charge.

Please visit our website for more information.