



SERION antigens

*Tailored Antigens for Highest CLIA Assay Performance -
New! Recombinant Measles, Mumps, Rubella & Varicella Antigens*

New Challenges Require New Antigens

For many years, enzyme-linked immunosorbent assays (ELISA) have been widely used for in-vitro diagnostics of infectious diseases. The constantly growing need for fully automated diagnostic solutions in routine diagnostics has led to an increasingly prominent use of chemiluminescence immunoassays (CLIA), which show several advantages over the ELISA. Fully automated CLIA systems offer high throughput combined with a superior and dynamic measurement range. Although a wide variety of assay formats can be established, most CLIA systems are based on beads (paramagnetic microparticles) as solid phase. In CLIA, unlike in ELISA, antigens are often immobilized by covalent coupling to reactive groups (carboxy-, amine- or tosyl-residues) on the surface of the microparticles. This leads to new challenges regarding the selection of appropriate antigens for CLIA assay development since the chemically defined coupling procedures work best under highly standardized conditions. For this reason, recombinant antigens are getting more in focus for the development of CLIA applications. The challenge for new antigen developments is the creation of tailor-made recombinant antigens optimized for state-of-the-art coupling procedures and diagnostic systems.

- ✓ ISO 13485 certified production environment
- ✓ High lot-to-lot consistency
- ✓ Industrial bulk quantities
- ✓ Complementary raw materials

Recombinant SERION antigens for MMRV Infectious Serology

Measles, mumps, rubella and **varicella (MMRV)** are widespread viral infections. In healthy children, the course of these diseases is often harmless and self-limiting. However, primary infection of adults, especially of immunosuppressed patients, and infection during gestation or of newborns may lead to severe complications and can even be lethal. Despite successful vaccination campaigns, measles, mumps, rubella and varicella serology still has great importance not only for the confirmation of acute infection, but also for the control of vaccination effectiveness, for the screening of pregnant women, or in the context of transplantations.

SERION Immunologic's new set of recombinant MMRV antigens complement the existing selection of native antigens. Though many native antigens perform quite well in CLIA assays, recombinant antigens often show a better and more reliable performance in chemical coupling procedures. The new recombinant MMRV antigens are expressed in insect cells, highly purified by strep-tag affinity chromatography and show a superior lot-to-lot consistency:

- The new recombinant measles and mumps antigens comprise the respective viral nucleoprotein. Nucleoprotein is the most abundant protein of measles and mumps virus. Multiple copies bind the RNA and form the helical nucleocapsid. Likewise, the recombinant nucleoproteins assemble in nucleocapsid-like particles about 20 nm in diameter, as measured by dynamic light scattering (DLS). Nucleoprotein is an immunodominant antigen that elicits T cell responses and antibody titers both after natural infection as well as after vaccination [1–3]. Hence, SERION Immunologic's recombinant **Measles** and **Mumps Virus Nucleoproteins (BA102R01 and BA103R01)** are ideal antigens for the design of serological tests.
 - The patented **Rubella Spike Ectodomain (E1-E2) (BA129R01)** antigen (patent no.: DE 10 2019 004 812) is the first recombinant capsid-free antigen for the production of highly specific IgG and IgM detection assays. The sequence of the recombinant protein is derived from the rubella vaccine strain HPV-77 [4–5] and combines the ectodomains of glycoproteins E1 and E2, which are major immunological targets for neutralizing antibodies [6–9].
 - The recombinant **VZV Envelope Glycoprotein E (BA104R02)** is suitable for efficient IgM and IgG detection. Glycoprotein E is highly expressed on VZV viral particles as well as on infected cells [10–11]. It is the immunogenic component in the licensed subunit vaccine Shingrix (Glaxo Smith-Kline Biologicals), which elicits a strong immune response and protects against herpes zoster [12].
- All antigens are produced in an ISO 13485 certified environment. Free test samples as well as bulk quantities are readily available.*

Order Information for Recombinant MMRV Antigens

Code	Description	Packaging
BA102R01	Measles Virus Nucleoprotein Nucleoprotein (nucleocapsid protein) of measles virus, assembled in nucleocapsid-like particles Source: recombinant protein, expressed in insect cells Molecular weight (nucleoprotein monomer): 61 kDa; Affinity tag: Strep-tag	1 mg
BA103R01	Mumps Virus Nucleoprotein Nucleoprotein (nucleocapsid protein) of mumps virus, assembled in nucleocapsid-like particles Source: recombinant protein, expressed in insect cells Molecular weight (nucleoprotein monomer): 64 kDa; Affinity tag: Strep-tag	1 mg
BA129R01	Rubella Spike Ectodomain (E1-E2) Spike glycoprotein ectodomain (spikes comprised of multiple E1 and E2 domains) of rubella virus strain HPV-77 Source: recombinant protein, expressed in insect cells Molecular weight: 78 kDa; Affinity tag: Strep-tag	1 mg
BA104R02	VZV Envelope Glycoprotein E Envelope glycoprotein E ectodomain of varicella-zoster virus (VZV) Source: recombinant protein, expressed in insect cells Molecular weight: 61 kDa; Affinity tag: Strep-tag	1 mg

Related Products

SERION Immunologics offers various essential raw materials for IVD assay development. Besides native and recombinant antigens, the broad product range includes monoclonal antibodies for the production of assay calibrators and controls, magnetic microparticles as well as rheumatoid factor (RF) absorbent and bovine serum albumin (BSA) as buffer ingredients.

Visit our website www.serion-immunologics.com for further information.



Selection of Complementary Raw Materials for IVD Assay Development

Code	Description	Packaging
031MP-C	MagSERION carboxy beads Carboxy functionalized superparamagnetic microspheres Size: 3 µm (size range 2.80 µm – 3.20 µm with 10% CV) Concentration approx. 100 mg/mL	100 mg
031MPSS	MagSERION amine beads Amine functionalized superparamagnetic microspheres Size: 3 µm (size range 2.80 µm – 3.20 µm with 10% CV) Concentration approx. 100 mg/mL	100 mg
MAB102.001H	Anti-Measles Virus monoclonal antibody, IgM, in human matrix Humanized monoclonal antibody presented in an IgG depleted and delipidized human serum matrix, Clone P5H6	1 mg
MAB103.001H	Anti-Mumps Virus monoclonal antibody, IgM, in human matrix Humanized monoclonal antibody presented in an IgG depleted and delipidized human serum matrix, Clone F11E4A7	1 mg
MAB129.001H	Anti-Rubella Virus monoclonal antibody, IgM, in human matrix Humanized monoclonal antibody presented in an IgG depleted and delipidized human serum matrix, Clone B16B11F8	1 mg
MAB104.001H	Anti-Varicella Zoster Virus (VZV) monoclonal antibody, IgM, in human matrix Humanized monoclonal antibody presented in an IgG depleted and delipidized human serum matrix, Clone D30B3D1	1 mg



References

- [1] B. Bankamp, U. G. Brinckmann, A. Reich, S. Niewiesk, V. ter Meulen, and U. G. Liebert, "Measles virus nucleocapsid protein protects rats from encephalitis," *J. Virol.*, vol. 65, no. 4, pp. 1695-1700, Apr. 1991, doi: 10.1128/JVI.65.4.1695-1700.1991.
- [2] K. Matsubara, S. Iwata, and T. Nakayama, "Antibodies against mumps virus component proteins," *J. Infect. Chemother.*, vol. 18, no. 4, pp. 466-471, 2012, doi: 10.1007/s10156-011-0358-3.
- [3] D. R. Latner et al., "Mumps Virus Nucleoprotein and Hemagglutinin-Specific Antibody Response Following a Third Dose of Measles Mumps Rubella Vaccine," *Open Forum Infect. Dis.*, vol. 4, no. 4, p. ofx263, 2017, doi: 10.1093/ofid/ofx263.
- [4] L. Z. Cooper, J. P. Giles, and S. Krugman, "Clinical trial of live attenuated rubella virus vaccine, HPV-77 strain," *Am. J. Dis. Child.* 1960, vol. 115, no. 6, pp. 655-657, Jun. 1968, doi: 10.1001/archpedi.1968.02100010657003.
- [5] H. M. Meyer, "Clinical Studies With Experimental Live Rubella Virus Vaccine (Strain HPV-77): Evaluation of Vaccine-Induced Immunity," *Am. J. Dis. Child.*, vol. 115, no. 6, p. 648, Jun. 1968, doi: 10.1001/archpedi.1968.02100010650002.
- [6] M. Trudel, F. Nadon, C. S. Guin, A. Amarouch, P. Payment, and S. Gillam, "E1 glycoprotein of rubella virus carries an epitope that binds a neutralizing antibody," *J. Virol. Methods*, vol. 12, no. 3-4, pp. 243-250, Dec. 1985, doi: 10.1016/0166-0934(85)90135-1.
- [7] K. Y. Green and P. H. Dorsett, "Rubella virus antigens: localization of epitopes involved in hemagglutination and neutralization by using monoclonal antibodies," *J. Virol.*, vol. 57, no. 3, pp. 893-898, Mar. 1986, doi: 10.1128/JVI.57.3.893-898.1986.
- [8] H. H. Chaye, C. A. Mauracher, A. J. Tingle, and S. Gillam, "Cellular and humoral immune responses to rubella virus structural proteins E1, E2, and C," *J. Clin. Microbiol.*, vol. 30, no. 9, pp. 2323-2329, Sep. 1992, doi: 10.1128/jcm.30.9.2323-2329.1992.
- [9] I. H. Haralambieva et al., "Characterization of rubella-specific humoral immunity following two doses of MMR vaccine using proteome microarray technology," *PloS One*, vol. 12, no. 11, p. e0188149, 2017, doi: 10.1371/journal.pone.0188149.
- [10] E. A. Montalvo, R. T. Parmley, and C. Grose, "Structural analysis of the varicella-zoster virus gp98-gp62 complex: posttranslational addition of N-linked and O-linked oligosaccharide moieties," *J. Virol.*, vol. 53, no. 3, pp. 761-770, Mar. 1985, doi: 10.1128/JVI.53.3.761-770.1985.
- [11] C. Mo, E. E. Schneeberger, and A. M. Arvin, "Glycoprotein E of varicella-zoster virus enhances cell-cell contact in polarized epithelial cells," *J. Virol.*, vol. 74, no. 23, pp. 11377-11387, Dec. 2000, doi: 10.1128/jvi.74.23.11377-11387.2000.
- [12] R. Nord et al., "Recombinant Glycoprotein E of Varicella Zoster Virus Contains Glycan-Peptide Motifs That Modulate B Cell Epitopes into Discrete Immunological Signatures," *Int. J. Mol. Sci.*, vol. 20, no. 4, p. E954, Feb. 2019, doi: 10.3390/ijms20040954.