

Toxoplasma gondii recombinant tetravalent chimeric antigens as a new generation of diagnostic tools for detection of human toxoplasmosis

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Currently, diagnosis of *T. gondii* invasion is based mainly on the use of the native antigens in enzyme immunoassay which allow for detection of IgG, IgM and IgA antibody classes. However, in some cases the performed studies give the ambiguous results. For this reason, many research groups are currently working on new diagnostic tools, which are mainly recombinant proteins. Compared to the native antigens their production is much easier, cheaper, faster and safer. An additional advantage of the recombinant proteins is easier way to standardize assays as well as the possibility of proteins selection characteristic for the development form of the parasite, which may allow for differentiation phases of the disease.

The aim of this study was to improve the performance of the IgM, IgG and IgG avidity ELISAs using next-generation recombinant chimeric proteins and thus, to demonstrate the diagnostic utility of *T. gondii* recombinant tetravalent chimeric proteins, composed of combination of four well-characterized antigens: MIC1, MAG1, GRA1, GRA2, ROP1, SAG1, SAG2, and different regions of AMA1.

The results of the study with human sera demonstrated, that a newly produced tetravalent recombinant chimeric proteins can be successfully used in the serodiagnosis of *T. gondii* infection. Results obtained in IgM, IgG and IgG avidity ELISAs based on chimeric proteins yield data comparable to TLA, used in commercial assays. The results of the study with human sera demonstrated, that a newly produced tetravalent chimeric proteins can be a good diagnostic tool for detecting IgG antibodies. Furthermore, one of the produced chimeric proteins (AMA1-SAG2-GRA1-ROP1), possesses a high ability to detect IgM antibodies and to determine the avidity index; therefore, it can be used to differentiate between the acute and chronic toxoplasmosis.

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