Cloning and sequencing of Toxoplasma gondii major surface antigen (SAG1) gene

A. Dalimi1; F. Ghafari Far; K. Solhjoo* ; Z. Sharifi

Abstract

Genetic typing methods of T. gondii strains have been extensively perfected in recent years. From a technical point of view, many tools usable for genetic studied on single-copy loci have been used: RFLP, PCR-RFLP, sequencing, RAPD-PCR and isoenzyme analysis. We described the cloning and sequence analysis of the gene which encodes the major surface antigen (SAG1 or P30) of T. gondii. SAG1 is the immunodominant antigen of Toxoplasma gondii tachyzoites being considered as the most promising molecule for a recombinant vaccine or such as DNA vaccine against toxoplasmosis. In the present work, first, genomic DNA of Toxoplasma gondii was extracted and used for amplifying of SAG1 gene as a template. Then PCR product was cloned into pTZ57R/T vector and plasmid containing SAG1 gene (pT-SAG1) was extracted from transformed bacteria and SAG1 gene cloned into pTZ57R/T was sequenced. Results showed that the P30 gene contains no introns and can extract it from genomic DNA of tachyzoite stage. Results showed also that SAG1 gene is cloned in pTZ57R/T plasmid, forming pT-SAG1 recombinant plasmid and E. coli TG1 strain is the best host for pT-SAG1 transformation. Sequence analysis of SAG1 gene cloned into pTZ57R/T vector showed that SAG1 gene sequence from a high virulent strain of T. gondii (Known as RH strain) has 100% sequence identity with P-Br strain, P strain and C strain and high homology of 98% with RH strain and ZS1 strain.

Keywords

Cloning; Sequencing; Toxoplasma gondii; SAG1; P30