

TITLE: DEVELOPMENT OF A LATEX AGGLUTINATION TEST AGAINST STX1 AND STX2 TOXINS FROM SHIGA TOXIN-PRODUCING *Escherichia coli* USING RECOMBINANT ANTIBODIES FRAGMENTS

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ABSTRACT:

Shiga Toxin-producing *Escherichia coli* and its subgroup Enterohemorrhagic *Escherichia coli* (EHEC), in addition to triggering mild diarrhea may also lead to more serious health conditions such as uremic colitis (CU) and hemolytic uremic syndrome (HUS), that can leads to around 5% of patients deaths, being children under 5 years old, elderly and Immunocompromised the major risk groups. Complications are related with the secrete toxins Stx1 and/or Stx2, an Ab5 type toxins, which the B subunit bind to their receptor Gb3 and translocate the active A subunit, which cleaves an adenine from the 28s rRNA, stopping the protein synthesis and leading the cell to death. The indiscriminate use of antibiotics during intoxication leads to an even greater production of Stx1/2. Thus, a diagnostic test is necessary to detect this infection. Antibodies have been used in several immunodiagnostic methodologies, however, their production confers disadvantages regarding the use of animals for production, recombinant antibodies rises as a alternative. The objective of this work was the use of a recombinant single-chain variable fragments (scFv) which are smaller in size, have a lower cost compared to whole antibodies, are produced in bacteria, and are susceptible to genetic enhancements, coupled in latex nanoparticles for a latex agglutination test against Stx toxins. The scFv was obtained from previously characterized hybridoma, and coupled in 1 μm latex nanoparticles and tested against 23 Stx1 STEC strains and 26 Stx1 non-producing strains for Stx1 and 27 Stx2 STEC strains and 27 non-Stx2 producing strains. The rapid latex test showed 88% of specificity 78% of sensitivity for Stx1 and 52% of specificity and 60% of sensitivity for Stx2. Taken together, this results shows a promise simple diagnosis test against STEC intoxication.

Keywords: Shiga toxin-producing *Escherichia coli*, single-chain variable fragments (scFv), latex agglutination

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