Highly sensitive microplate chemiluminescence enzyme immunoassay for the determination of staphylococcal enterotoxin B based on a pair of specific monoclonal antibodies and its application to various matrices.

Abstract
A highly specific and sensitive microplate chemiluminescent enzyme immunoassay (CLEIA) was established and validated for the detection of staphylococcal enterotoxin B (SEB). A pair of monoclonal antibodies (mAbs) that recognizes different epitopes of SEB was selected from 20 SEB-specific mAbs, and the experimental conditions were examined and optimized for the development of the CLEIA. This method exhibited high performance with a dynamic range of 0.01-5 ng/mL, and the measured limit of detection (LOD) was 0.01 ng/mL. Intra- and interassay coefficient variations were all lower than 13% at three concentrations (0.2, 0.4, and 2 ng/mL). For specificity studies, when this method was applied to test staphylococcal enterotoxins A, C1, and D, no cross-reactivity was observed. It has been successfully applied to the analysis of SEB in a variety of environmental, biological and humoral matrices such as sewage, tap water, river water, roast beef, peanut butter, cured ham, 10% nonfat dry milk, milk, orange juice, and human urine and serum. The aim of this article is to show that the highly sensitive, specific, and simple microplate CLEIA, based on a pair of highly specific monoclonal antibodies, has potential applications for quantifying SEB in public health and military reconnaissance.