

DEVELOPMENT OF A CAPILLARY BASED
HELICOBACTER HEPATICUS BIOSENSOR

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ABSTRACT

Helicobacter hepaticus causes hepatitis in mice. Infections with *H. hepaticus* can invalidate animal research studies and early detection helps curtail the spread of infection. The objective of this study was to develop a quick and accurate biosensor platform for the detection of *H. hepaticus* in fecal samples. This research investigated an optical immunosensor using capillary waveguides and a competitive immunoassay technique.

H. hepaticus was immobilized to the inner wall of the capillary. A *H. hepaticus* antibody was conjugated to AlexaFluor 546 to serve as the fluorescent tracer and added to samples containing *H. hepaticus*. Sample *H. hepaticus* (analyte) bound to the antibodies in solution, thereby preventing the antibodies from attaching to the immobilized *H. hepaticus*. Several methods were utilized to analyze the fluorescence resulting from the immunoassay. Results showed the biosensor is capable of detecting low levels of *H. hepaticus* (1.0 ng) in an assay time of approximately one hour.