

**DEVELOPMENT OF A FRET BIOSENSOR TO DETECT THE PATHOGEN
*MYCOPLASMA CAPRICOLUM***

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ABSTRACT

Mycoplasmas are a species of bacteria that invade any type of cell and are adaptable to changing environments. We are developing an optical biosensor based on Fluorescence Resonance Energy Transfer (FRET) for detection of these pathogens, specifically for *M. capricolum*. Three different anti-peptide antibodies, (E, F₁, and F₂), were conjugated with AF-546 dye (donor). Then the antibodies were complexed to Protein G labeled with AF-594 dye (acceptor). When these detection complexes were bound to bacteria or specific peptide, there was a change in the 3-D conformation of the antibody causing a measurable change in acceptor emission. α -pep F₁ had the most distinct change at 12% so it was used in two different systems (organic fluorophores and a gold nanoparticle quenching system) and immobilized onto optical fibers. Our data illustrates that fiber optic biosensors measure conformational changes occurring when antibodies bind antigens and thus is a viable detection method for mycoplasmas.