

Novel Diagnostic Platform for Detection of Bovine Infectious Diseases

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Current disease control strategies in cattle industry are based on improving animal health management and reducing the risk of disease introduction by animal additions. Efficient disease detection plays a critical role in this approach. Current diagnostic methods are lab based and expensive which negatively impacts the implementation of disease control strategies.

Therefore, we propose to develop a pen-side diagnostic test that will be able to detect the exposure to specific infectious pathogens in a timely manner. The test will be based on engineered recombinant proteins, called bioswitches that have the capacity to trigger enzymatic activity. These proteins will be engineered to detect antibodies produced during the course of infection. The presence of pathogen specific antibodies will lead to enzyme activity which will be easily recognized by the production of signal measurable by a small handheld device. These bioswitches will be entirely produced by unlimited and relatively inexpensive expression in *E. coli*. They will be used on farms and they will not rely on any expensive equipment.

Implications: The outcome of proposed project will be a easy-to-use diagnostic test for many infectious diseases in the cattle industry, that will facilitate and encourage more frequent monitoring of individual animals and entire herds and will be used in decision making strategies to control and manage these diseases.