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Field Friendly Tuberculosis Biosensor N. PROPER, M.S. SCHERMAN, K.L. JEVSEVAR, J. STONE, M.R. MCNEIL, D. KRAPF, Colorado State University, KRAPF LABS COLLABORATION — Tuberculosis (TB) is a fading threat in the United States, but in the developing world it is still a major health-care concern. Given the rising number of cases and lack of resources, there is a desperate need for an affordable, portable detection system. We are working towards the development of a field-friendly immunological biosensor that utilizes fluorescence microscopy to undertake this task. We observe fluorescently labeled antibodies/antigens as they bind to a glass slide treated with polyethylene glycol (PEG) in order to inhibit non-specific adsorption. Antibodies against the antigens of interest are bound to the PEGylated glass slides via biotin-streptavidin interactions. Then, fluorescently labeled antibodies are mixed with different concentrations of TB antigens and this solution is incubated on the treated glass slides for 30 minutes. The slides are thoroughly rinsed with water following the incubation period. The antigens are then detected by fluorescence using a low-cost biosensor. Our system includes a “supermarket-scanner” HeNe laser, home-built electronics, off-the-shelf optics and a Si photodiode. Work is underway to incorporate a flow-cell into the system, in a small portable box.

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