

Abstract Submitted
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Mechanically

Transduced

Immunosorbent Assay JOSHUA STEIMEL, MICHAEL PAPPAS, ALFREDO ALEXANDER-KATZ, Univ of the Pacific — Viral infections like COVID19 present one of the biggest threats to human health however the ability to rapidly, robustly, and accurately test the presence of these viral proteins remains an obstacle. Traditional techniques like PCR while accurate is slow and expensive while ELISA does not have the required resolution. Here, we present a novel technique, a Mechanically Transduced Immunosorbent Assay (METRIS). This new method utilizes the fundamental concept of friction in order to produce a mechanical signal as opposed to an optical signal which is typically used to detect biological interactions. METRIS utilizes a ferromagnetic particle which can be coated with functionalized proteins, lipids, antibodies, and other biological materials. These particles are made active by an externally applied rotating magnetic field which causes the particle to roll across a substrate functionalized with biological materials that can bind to the particle or assist with binding to proteins or viral components in the fluid. The translational displacement of the rotating particle is induced by the effective friction of binding events which will scale with the strength and density of the biological interactions. This new technique is fast, cheap, robust, and highly sensitive.

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