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Assay for Detecting Viral Pathogens

-As we make our way through the third year of the global pandemic, one thing is abundantly clear, COVID testing is just as important now as it was in the beginning. But not all testing is created equal. PCR is highly sensitive; however, it requires well-trained personnel and expensive equipment, prohibiting home use and limiting use in areas with limited medical resources. Antigen testing is rapid and much more convenient, but it has low sensitivity and can give false negative results, particularly with patients early in their infection and with low viral loads.

Researchers at the Biodesign Institute of Arizona State University, developed novel tools for detecting viral pathogens in colorimetric paper-based diagnostic assays. These tools exploit single stranded RNA nanostructures to accurately identify viruses, including SARS-CoV-2 and Influenza, from clinical saliva samples in a single paper-based readout reaction. The use of these tools for viral pathogen testing provide powerful sequence-independent molecular sensing at unprecedented sensitivity and specificity. These tools were tested on a set of positive and negative saliva samples and demonstrated accurate identification of SARS-CoV-2. They were also applied to differentiate influenza A subtypes and were able to distinguish H1N1, H5N1 and H1N2 from closely related virus subtypes.

These tools allow for visual readout and detection of viral pathogens with greater accuracy, reduced complexity and lower costs.

Potential Applications

- Detection of SARS-CoV-2
- Detection of Influenza and Influenza subtypes

Benefits and Advantages

- The assay was able to detect each of the samples correctly with a 100% sensitivity and 100% specificity
- Clear color change observed, by the naked eye, in the presence of the correct

viral RNAs
    - Results observed after 90 minutes
- Reduces false positives
- Decreased assay complexity and cost

For more information about this opportunity, please see

Ma et al - Nature Biomedical Engineering - 2022

For more information about the inventor(s) and their research, please see

Dr. Green's laboratory webpage