Development of a DNA Amplification-Free Assay for Pathogen Detection

Main Goal:

- ✓ *Is this method capable of detecting pathogens or not?*
- ✓ *If pathogen is not in the environment, will it show the wrong result or not?*
- ✓ *What will be the maximum time required to detect a pathogen?*
- ✓ *Are the light reactions resulting from the detection process enough to allow us to detect with the naked eye?*

Main achievements:

- ✓ *The possibility of detecting any type of pathogen in a short period of time without performing the usual methods such as PCR and as a result, reducing the time and cost of performing common diagnostic tests.*
- ✓ *Providing identification and diagnostic solutions for an emerging pathogen, in less than 1 week on a global scale.*
- ✓ *Easy to use while wearing protective equipment (such as JLIST/MOPP).*
- ✓ *The ability to detect pathogens directly from several types of environmental samples/body fluids, etc.*
- ✓ *Pathogen identification and diagnosis with more than 99% accuracy.*
- ✓ *Get test results in less than 10 minutes.*
- ✓ *No restrictions on the supply of raw materials at the time of high demand.*

Required Area:

- ✓ *250 m^2 (Clean Room)*
- ✓ *500 m^2 (Lab & Office)*

Production Cost Per:

- ✓ *1 - 3 USD per Test.*

Abstract:

The increasing prevalence of viruses in this era requires fast, cheap and sensitive methods to identify and overcome them in an effective way. This risk of pathogenicity, together with the fact that many viruses can mutate rapidly, highlights the need for appropriate and rapid diagnostic measures, especially as the world looks to prepare for future pandemics or the next dangerous pathogen.

The obstacles of the current diagnostic methods are time-consuming, expensive, the need for expert personnel and expensive devices, and reliance on electricity. Here, I have presented a method that can detect any type of pathogen with the same accuracy as the PCR method, and through this method, the diagnosis can be made directly from any new tissue such as blood, animal or plant tissue.

This method does not depend on temperature cycles, specific enzymes or complex laboratory protocols and also is able to perform detection at ambient temperature. The time from the beginning to the end of this method will be about 10 minutes and the result will be obtained in the form of changing in the color of the solution.

Market Size:

Global Pathogen Specific Kits Market was valued at USD 5.40 billion in 2022 and is expected to reach the value of USD 8.71 billion by the year 2030, at a CAGR of 5.30% during the forecast period.