The CUNY Center for Advanced Technology In Photonics Applications (CUNY CAT)
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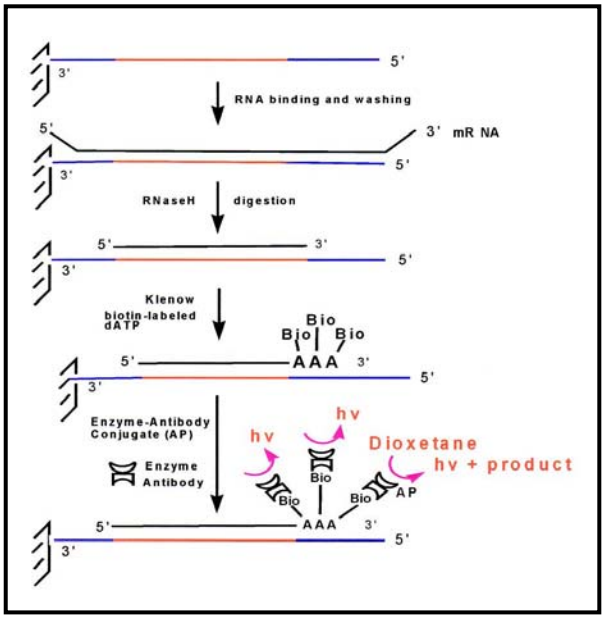
Detection of Pathogens Using an RNA MicroChip

A novel technique for the accurate and rapid detection of pathogens using an RNA detection and quantification methodology on a MicroChip has been developed. This RNA microchip technology is an ideal approach for pathogen detection in biodefense and the detection of microbial contamination in food, air and water supplies. The technology is simple to implement, rapid, accurate and sensitive. It's high-throughput, and cost-effectiveness when compared to other techniques and will enable better, more reliable and lower cost implementations.

This novel methodology dramatically simplifies sample handling and reduces the costs of reagents and the need for special instruments. This strategy is particularly well suited to the challenges associated with rapid detection of pathogens and continuous monitoring of air and water sources in the field.



Simple And Rapid Detection Of RNA On Solid Phase.

Advantages

- RNA detection via chemiluminescence
- Simple, rapid and direct
- Doesn't need PCR or reverse transcription
- No laser excitation - fluorescence detection,
- No radioactive labeling, or gel electrophoresis.
- Suitable for analysis of environmental samples even where mRNAs are partially degraded.

The Technology

After an RNA sample is loaded onto RNA MicroChip immobilized with detection templates, resulting in the binding of specific RNAs, the unbound RNAs are washed away (see the scheme). After hapten labeling (such as biotin), an enzyme-binder conjugate then binds specifically to the labeled RNA target, converting the hapten label to the enzyme label [such as alkaline phosphatase (AP)]. The addition of a substrate (e.g., dioxetane) allows the generation of chemiluminescence. This technique has been used to demonstrate for the first time selective detection of LacZ mRNA in yeast. In the future, it is expected that a method can be developed for the rapid and specific analysis of pathogens (such as Bacillus Anthrancis) and other biohazards using this RNA microchip technology.

This technology opportunity sheet describes continuing efforts in this area. Several patents may have been issued or are pending and which may be available for licensing.

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