

Electrospray Depositing System for Biological Materials

Researchers at the University of South Florida have invented a method of directly coating biological materials on a glass surface for use in preparing immunoassay substrates.

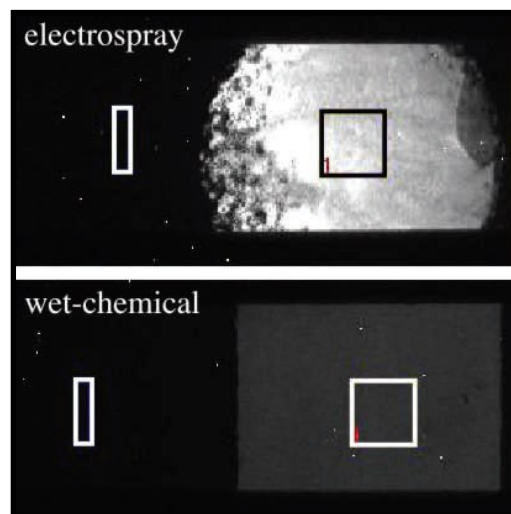
“Sandwich” immunoassays are utilized as a tool to specifically identify and/or detect analytes such as bacteria, fungi, viruses, and protozoa in samples. Capture molecules, such as antibodies, bind to the target cells and capture them while other debris and non-target cells in the sample are washed away. In assays that require capture molecule attachment to a substrate such as a glass slide, the glass surface must be coated with silane. The chemistry involved in the silane preparation method is tedious and must be performed in the absence of oxygen using the flammable substance toluene as the solvent. The toluene/silane contaminated reagents must then be discarded as hazardous waste. This complex attachment process can take several days to complete, and often leads to undesired results due to the complex multi-step procedure.

To simplify the process, our researchers have invented an electrospray-based method to deposit the biological materials. In this process, a harmless water or buffer solvent containing the material is injected into a vacuum chamber as a spray, where it passes through consecutive vacuum stages. As the spray enters into deeper vacuum the solvent is extracted, leaving only the solute behind, which is deposited as desired. The spray can be focused to a specific area allowing patterning of the substrate. The amount of coating can be controlled and a specified number of coats of the same or different molecules can be added to the surface. This new procedure will greatly increase the efficiency of performing immunoassays.

ADVANTAGES:

- **Reduced preparation time**
- **Avoids generation of hazardous waste**
- **Enables patterning and mass selection of the deposited material**

Efficient and Non-Hazardous Method for Preparing Immunoassay Substrates



Fluorescence Images of Results Using Wet-Chemically Prepared and Electrospray Methods. 4x Sensitivity Improvement via the Electrospray Method

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