



## Streamlining Diagnostics: An In-depth Look at Automated Immunoassay Analyzers

Jeon Sang\*

Department of Laboratory Medicine, Seoul National University Hospital, Seoul, Korea

\*Corresponding author: Jeon Sang, Department of Laboratory Medicine, Seoul National University Hospital, Seoul, Korea; E-mail: sangjeon@gmail.com

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### Description

In the field of clinical diagnostics, immunoassays play a crucial role in detecting and quantifying biomolecules, such as proteins, hormones, and antibodies. Traditionally, these assays were performed manually, which was labor-intensive, time-consuming, and prone to human error. However, with advances in automation technology, automated immunoassay analyzers have revolutionized the diagnostic industry, providing accurate, efficient, and reliable results.

In this article, we will delve into the world of automated immunoassay analyzers, exploring their key features, advantages, limitations, and applications. We will also discuss the different types of automated immunoassay analyzers available in the market and their technological advancements. So, let's dive into the details and understand how these innovative instruments are shaping the landscape of diagnostics.

### Understanding automated immunoassay analyzers

Automated immunoassay analyzers are sophisticated instruments that automate the entire immunoassay process, from sample preparation to result interpretation. These analyzers use various techniques, such as Enzyme-Linked Immunosorbent Assay (ELISA), Chemiluminescence Immunoassay (CLIA), Fluorescence Immunoassay (FIA), and Radioimmunoassay (RIA), to detect and quantify analytes in biological samples.

One of the key components of an automated immunoassay analyzer is the sample processing module, which can handle multiple samples simultaneously, reducing the need for manual sample handling. These

analyzers also incorporate advanced robotics, liquid handling systems, and software algorithms to ensure precise and reproducible results.

### Advantages of automated immunoassay analyzers

Automated immunoassay analyzers offer several advantages over manual immunoassay methods, including:

**Increased efficiency:** Automated immunoassay analyzers can process a large number of samples in a short period of time, reducing the turnaround time for results. This improves the workflow in clinical laboratories, allowing for faster diagnosis and treatment decisions.

**Enhanced accuracy and precision:** Automation minimizes human error, resulting in accurate and reproducible results. These analyzers also have built-in quality control measures to ensure the reliability of results, reducing the need for retesting.

**Higher throughput:** Automated immunoassay analyzers can handle a high volume of samples simultaneously, making them ideal for high-throughput laboratories or hospitals with a large patient population.

**Cost-effective:** Although automated immunoassay analyzers require significant upfront investment, they can save costs in the long run by reducing labor costs, minimizing reagent waste, and improving resource utilization.

**Improved safety:** Automation eliminates the need for manual handling of hazardous samples, reducing the risk of exposure to biohazardous materials and improving the safety of laboratory personnel.

### Limitations of automated immunoassay analyzers

Despite their numerous advantages, automated immunoassay analyzers do have some limitations, including:

**Cost:** Automated immunoassay analyzers can be expensive to purchase, install, and maintain, making them less accessible to smaller laboratories with limited budgets.

**Complexity:** These analyzers require skilled operators who are trained in instrument operation, maintenance, and troubleshooting. The complexity of the instruments may pose a challenge for laboratories with limited technical expertise.

**Sample types:** Automated immunoassay analyzers may have limitations in handling certain sample types, such as samples with low analyte concentrations or samples with interfering substances. Additional sample pre-treatment steps may be required, adding to the complexity of the workflow.

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