

Press Release

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Electrophoresis on the next level

**New microchip electrophoresis system for the replacement of agarose gel electrophoresis/
Significant reduce of running cost/ Increase in sensitivity and
Time saving thanks to fully automation capable for up to 120
analyses per set up**

Shimadzu, one of the world leaders in analytical instrumentation, has released the MCE-202 MCE-202 "MultiNA", a microchip electrophoresis system for DNA/RNA analysis. This system provides completely automated, high-speed microchip electrophoresis, and it reduces running costs.

The running costs for the MultiNA are comparable to or less than agarose gel electrophoresis costs. Manual operations involved in pre-treatment, separation, detection, and preparation of data have been completely automated. Supporting all types of research, the MultiNA is capable of analyzing DNA/RNA separation size (length) quickly, simply and reliably, for up to 120 samples in one set up.

Agarose gel electrophoresis vs. to Microchip electrophoresis

In agarose gel electrophoresis DNA/RNA are separated in an electric field due to their charge to determine their molecular weight. To visualize the electrophoresis pattern of these nucleic acid chains the samples in the gel have to be stained with ethidium bromide or a

fluorescent agent. After visualization on a UV light box the resulting pattern provides information on molecular weights and the individual identification.

Microchip electrophoresis uses electrophoresis to separate target substances, utilizing a device with microfabricated grooves on a glass or plastic substrate. Applied in the life sciences as next generation technology, it offers the advantage of high-speed, high reproducible and high sensitive micro analysis.

Background to New Product Development

In different applications in molecular biology DNA and RNA nucleic acid samples requires the confirmation of sample size (length) and approximate quantitation. Agarose gel electrophoresis systems are the most widely used devices to provide this confirmation. However, in the last years an increase can be observed in microchip electrophoresis systems, which perform electrophoresis separation on microchips.

Agarose gel electrophoresis systems require a considerable amount of manual labor, using separate equipment in each of six stages, from gel preparation to data processing and generally offer only rough separation. In contrast, microchip electrophoresis systems can perform these six processes within a single device. They are normally used for applications involving quick sample size confirmation.

However, even though the need for these systems is great, their running costs are fairly high, which has slowed the transition from agarose gel electrophoresis systems to microchip electrophoresis systems. Thanks to Shimadzu's development of a reusable microchip has resulted in running costs comparable to or less than those for agarose gel electrophoresis. In addition, by offering reagent kits that

correspond to separation size (length), a product capable of completely automatic high-speed analysis has been developed, ensuring simple operability, high separation, and high repeatability.

A summary of the features of this new product are as follows:

Reduces running costs

By developing a reusable microchip and by creating reagent kits that correspond to separation size (length), DNA or RNA analysis with this product can be run at comparable or superior to the cost of agarose gel electrophoresis.

Provides complete high-speed automation of up to 120 cycles and efficient automatic analysis, starting from just 1 sample

The MultiNA is capable of registering up to 120 analysis cycles, completely automating the analysis process. Further, it can also perform efficient automatic analysis starting from just 1 sample, a feature that equivalent-class devices do not offer. Also, a set quantity of reagent is automatically injected, meaning that only minute amounts of important samples (minimum: 2 μ L) and reagents need to be used. At the same time, this also prevents the loss of reagent through operation errors and operator-induced data variances.

Ensures high separation and repeatability with a short separation flow channel microchip

Select the optimal kit from four types, corresponding to the DNA/RNA sample size range being analyzed. Migrating two internal markers (with low and high molecular weights) together with the sample corrects the variance characteristic of the electrophoresis method, ensuring high separation and repeatability.

All-out pursuit of speed and convenient operability

After an analysis schedule is created, users simply need to set the sample and the reagent, and click the start button. All processes are completely automated; from microchip rinsing, filling with separation buffer, introduction of sample and electrophoresis separation, all the way to data analysis. In addition, the MultiNA is equipped with a variety of support tools that help simplify analysis schedule creation.



Figure 1: MCE-202 "MultiNA"

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