



Contribute to high-quality primary care with fusion of highly sensitive, compact immunoassay device and ICT

Development of highly sensitive, compact immunoassay system

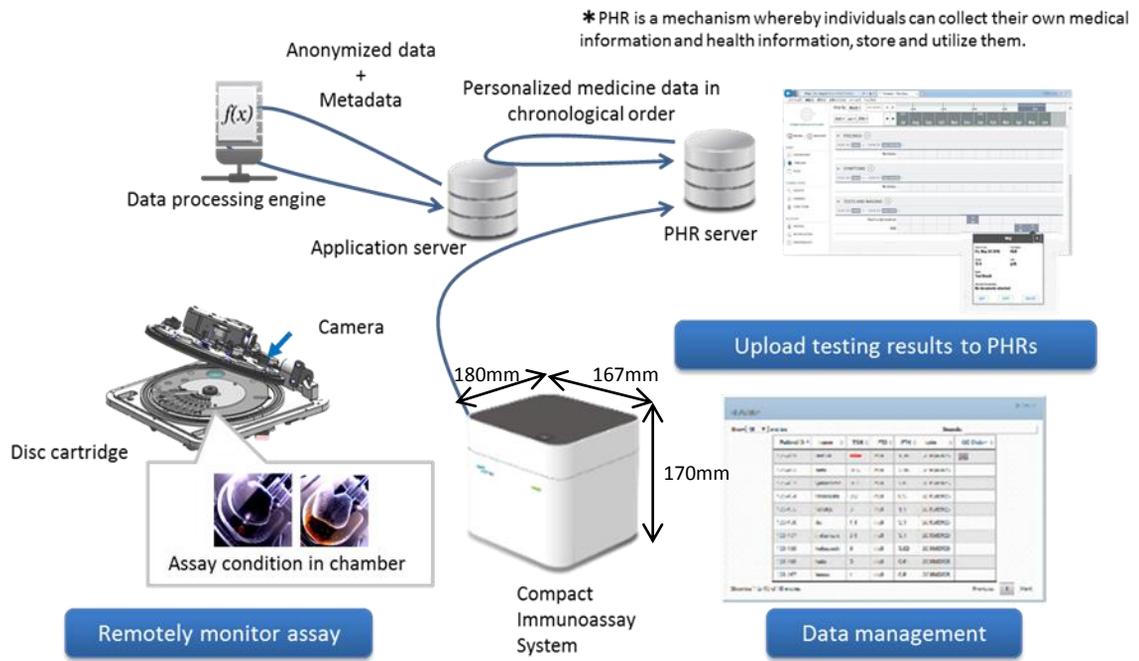
Device:
Compact Immunoassay System

People have become increasingly aware issues related to their own health and healthcare services. The advances in ICT and increasing popularity of mobile devices (such as wearables) have accelerated this trend. Increase in healthy life expectancy is a key objective to reduce costs of medical care related to aging. Towards this end, the role of community healthcare including preventive care has become more important. A paradigm shift in healthcare is thought to be going on.

Numerous clinics outsource clinical investigations that require high-precision testing owing to high-costs and infrastructure requirement for large-size equipment. This inevitably delays clinical decision-making as the test results are not available on the same day.

We developed a reagent cartridge that includes fluid channels developed with use of microfluidics technology, and have succeeded in making a simple and compact device. Utilizing protocols and reagents of Sysmex immunoassay system, HISCL[®], has realized high sensitive immunoassay in a small reagent cartridge. The network connection interface of this device allows access to a host of additional functionalities, such as viewing test results via a specific web portal and remote monitoring of measurement status.

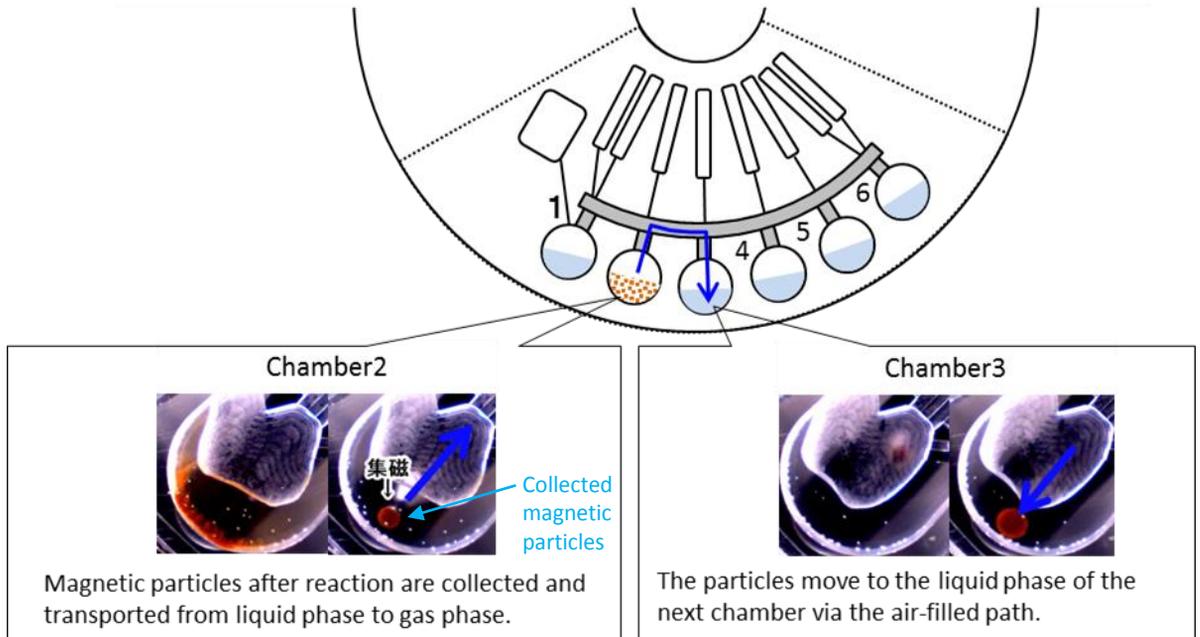
This device with ICT data management system makes it possible for doctors to get on-site results in real-time which provides a powerful leverage to the treating physician. We aim to contributing to primary care of community healthcare.



Principles of measurement: MINT (Magnetic-particles INduced Transportation)

Plasma is separated by the centrifugal force in the compact immunoassay system after blood is dropped on the reagent cartridge. Another centrifugal device is not required.

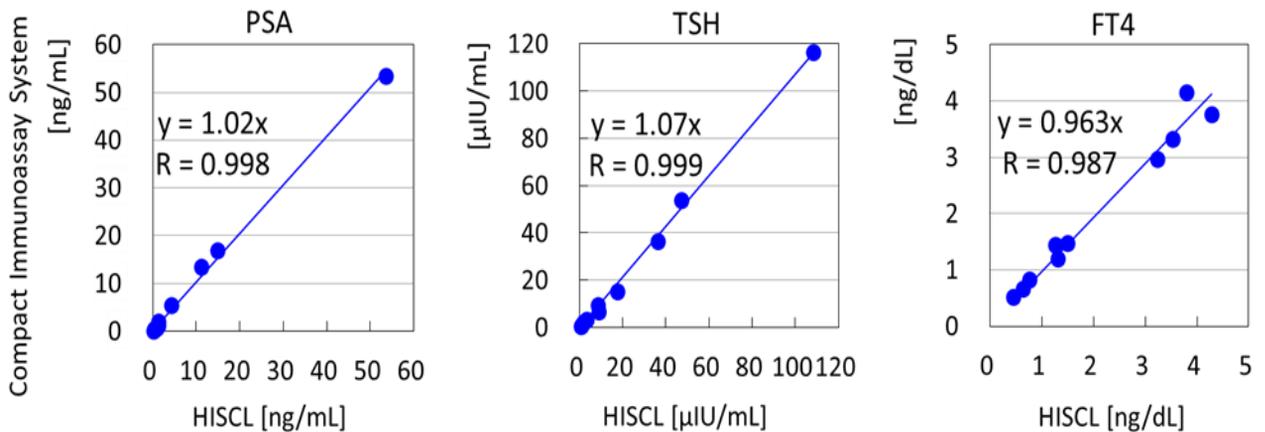
The separated plasma is conveyed to a reagent-pooled chamber, and target molecules in the plasma bind to antibodies on the surface of magnetic particles. These particles are collected by a magnet which is set under the cartridge, then conveyed to the next chamber by magnet and centrifugal force. This unique transportation technology, named MINT, allows for highly sensitive measurement, CLEIA (Chemiluminescent Enzyme Immunoassay) by virtue of its efficient technology for separation of target molecules from the contaminants.



MINT technology: Schematic illustration of the transportation of magnetic particles in the cartridge

Performance of compact immunoassay system

High correlation was observed between the results of compact immunoassay system and HISCL[®] for serum assays for PSA (a cancer biomarker), and TSH and FT4 (thyroid gland) hormones



Correlation between serum levels of PSA, TSH, FT4 assessed with compact immunoassay system and HISCL[®]