Development of UHPLC

Our Performance-oriented World

Ideal Ultra High Performance Liquid Chromatograph Pursued by Everyone

The development of Hitachi's first UHPLC began in 2010. In the field of UHPLC, Hitachi High-Technologies Corporation was the last to start the development. However, we, counting in the company's history as Hitachi, Ltd., have over half a century's worth of achievements and experiences in the field of HPLC.
With the generous applications of technologies and know-hows the company can offer, Hitachi Ultra High Performance Liquid Chromatograph "ChromasterUltra Rs" was perfected and launched into the market.
ChromasterUltra Rs is filled with the wisdoms and experiences that only engineers can provide and invites you to the profound world of the UHPLC development.

Vol.1

i n t e r v i e w

No Challenge, No Gain.

Development of Hitachi's First UHPLC

In the biotechnology field, where the hottest topic is iPS cells, new drugs are actively developed as we deepen our understanding of life phenomena. On the other hand, with people's increased awareness of food safety, there are rising needs for food related analyses. Because of those situations, the ultra high performance liquid chromatograph "ChromasterUltra Rs," which was newly developed by Hitachi High-Technologies Corporation, is receiving attention.

In general, it takes a long time to develop a new drug. It is a daunting task because it is necessary to repeatedly investigate which ingredient is effective and its possible effectiveness. However, once an efficient analytical process is developed, the time required for new drug development can be shortened. UHPLC is the instrument that can significantly contribute to such cutting-edge research and development fields.

The fundamental research began in 2010 and we started the full-scale development for the production in the second half of 2011. However, we were the last to develop UHPLC and thus, we all agreed to aim for the world's best functionality, performance, and maximum pressure," says Kawarai. As the director of the design department, he always pursues impactful products that can change the world. Thus, three design objectives of "high resolution," "high maximum pressure," and "ultra high-speed" were defined. Kawarai believes that this type of high aspiration vitalizes the whole UHPLC team and brings about great success.

Optical Instruments Engineering Department
General Manager

Naomi Kawarai

He joined Hitachi Ltd., as it was a local company in his hometown of Ibaraki prefecture. When he joined the company, he was assigned to develop software-related products. He currently focuses on the schedule, development cost, and cost management as the director for designing.

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ChromasterUltra Rs, an ultra high performance liquid chromatograph, provides the ultimate in high performance, high resolution, and high sensitivity analysis that are becoming requirements for research and development in pharmaceutical and chemical fields.
Hitachi UHPLC supports cutting edge studies including the high resolution analysis of chemically-similar substances and impurities in synthetic compounds and the high sensitivity detection of impurities such as harmful substances that are becoming increasingly relevant in our daily lives.

Ultra High-Speed Analysis

- World's highest range of the pressure resistance, which is 140 MPa*1, not only supports high-speed analysis but also gives selectivity of mobile phase which likely causes of higher pressure. This delivers more variety of analysis.

High Resolution Analysis

- The newly developed high resolution column (LaChromUltra Ⅱ C18 (1.9 μm), 250 mm), has a high number of theoretical plates (50,000), and high pressure resistance, taking ultra high resolution analysis to the next level.
- A newly designed 6170 Binary Pump with independent variable stroke plungers ensures solvent delivery with higher mixing performance and stability as it employs the low-volume double corkscrew mixer in addition to its unique LBT*2 control.
- The standard installation of the 6430 Diode Array Detector includes a total reflection type capillary flow cell unit (optical path length: 10 mm). The excellent control of the extra-column dispersion contributes to higher resolution analysis.

High Sensitivity Analysis

- By using the high sensitivity flow cell unit for 6430 Diode Array Detector (optical path length: 65 mm) (optional), excellent sensitivity can be obtained from the 6430 Diode Array Detector.
- The 6430 Diode Array Detector equipped with a new optical system achieves low noise and low drift which are key to high sensitivity analysis.
- The 6270 Autosampler, which allows a selection of multiple washing modes, is installed with an injection port reverse washing mechanism and can provide the excellent carry-over performance.

∗1 Among models sold in Japan, surveyed by Hitachi High-Technologies as of July 2013
∗2 LBT：Liquid Beat Technology

ChromasterUltraRS

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