

# Press Release

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## **New C2MAP automated pretreatment module Complete LC/MS solution for cell culture analysis**

**All steps from pretreatment to measurement without any human intervention /  
Growing importance of LC-MS/MS analysis to optimize cell culture conditions/  
Shortens culture media analysis time by 80 percent**

Celebrating this year the 50th anniversary of its presence in Europe, Shimadzu emphasizes its Excellence in Science approach through the release of the new C2MAP-2000 automated pretreatment module for cell culture media analysis. C2MAP-2000 highlights the company's position of a world leader in analytical instrumentation. This product is for pretreating of culture media samples by adding reagents such as a deproteinizing agent or internal standard substance, filtering of precipitated proteins, and diluting of samples.

The C2MAP system combines the C2MAP-2000 module with a Shimadzu ultra-fast liquid chromatograph mass spectrometer (LC-MS/MS). By automating all the process steps from pretreatment to measurement, the C2MAP system shortens the culture media analysis time for up to 95 components in culture supernatants<sup>1</sup> to one sixth of the previous level. In addition, this system can be operated by less experienced operators.

After simply loading culture supernatant samples, reagents and pairs of filter and recovery vials, the C2MAP-2000 module is able to execute all steps from pretreatment to LC-MS/MS measurement without any human intervention. This seamless execution not only makes it easy to process samples unattended overnight or on non-working days, but also enables samples to be controlled using the same ID for all process steps. This minimizes the risk of selecting the wrong sample while ensuring traceability. C2MAP-TRENDS time-course viewer software loads the measurement data obtained and graphs temporal changes in each component concentration as trend graphs.

### **Growing importance of LC-MS/MS analysis to optimize cell culture conditions**

In recent years in antibody pharmaceutical fields, it has become increasingly important to record the consumption of components and accumulation of waste matter (secreted metabolites) in culture media, so that cell cultivation parameters can be optimized for

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<sup>1</sup> Culture solutions with floating and dead cells removed

manufacturing drug substances. In addition, in regenerative medicine fields that involve iPS, ES or other cells, there is a need for technology that can evaluate cell quality in real time without damaging the cells. There is also a need to reduce the replacement frequency of expensive culture media. Since monitoring the changes in culture supernatant components over time provides information that is useful in these fields, the role of LC-MS/MS analysis has increased in the optimization of cell culture conditions.

However, due to the lack of products available for seamlessly performing of all processes from sample preparation to measurement, there was a need for a system that could be used easily, even by less experienced operators. Shimadzu therefore developed the C2MAP-2000 automated pretreatment module and the C2MAP system for steps involved in determining the status of cultures and researching cultivation process steps at major pharmaceutical companies, biotech ventures, pharmaceutical CMOs (contract manufacturing organizations) and various research institutions. In the future, Shimadzu intends to offer solutions based on LC-MS/MS measurement technology for controlling and optimizing of cell cultivation process steps.

#### **Main components of the C2MAP system**

- C2MAP-2000 automated pretreatment module:  
Performs pretreatment processes necessary for LC-MS/MS analysis.
- Nexera X2 ultra high performance liquid chromatograph:  
Separates individual components contained in pretreated samples.
- LCMS-8060/8050 ultra-fast liquid chromatograph mass spectrometer:  
Detects each component separated with high sensitivity and measures its mass.
- C2MAP TRENDS special viewer software:  
Plots a line graph of changes in respective component concentrations over time, based on LCMS-8060/8050 results. These graphs are useful for understanding how the concentration of components in a culture supernatant increases or decreases during the cultivation process, and for understanding the differences in how components fluctuate given different cultivation parameters.

#### **Trademarks:**

C2MAP, C2MAP system, Nexera and LCMS are registered trademarks or trademarks of Shimadzu Corporation.

#### **Web summary**

Shimadzu has introduced the new C2MAP-2000 automated pretreatment module for cell culture media analysis. By automating all process steps from pretreatment to measurement, the C2MAP system shortens the culture media analysis time for up to 95 components in culture supernatants to one sixth of the previous level. This system can even be operated by less experienced operators.



**Figure 1:** The new C2MAP automated pretreatment module covers all steps from pretreatment to measurement without any human intervention. This highly efficient system can even be run by less experienced operators.

Web link: [www.shimadzu.eu/c2map](http://www.shimadzu.eu/c2map)



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