



# Ultra Performance LC Separation Science Redefined

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# INTRODUCTION

## Separation Science Redefined

In 2004, Waters introduced a new category of LC technology that has changed separation science forever.

We call it ACQUITY Ultra Performance LC or UPLC.

Based on novel chemistry and instrumentation, UPLC delivers new levels of resolution, speed and sensitivity.

I am pleased to report that interest in UPLC from scientists worldwide has been outstanding, from those looking to drive new products through the development process faster, to those looking for a more robust technique for routine analytics, to researchers who need to push MS performance to the next level.

Scientists are now realizing they can do and see with UPLC what they couldn't do and see with HPLC. Some of their exciting work is found in the pages of this supplement. As you will see, the benefits are real and they are compelling.

Throughout 2005, Waters will be adding to its existing portfolio of UPLC products. As recently as March, Waters introduced three new chemistries: a C8, phenyl, and a Shield RP18, as well as an evaporative light scattering detector, further expanding applications for UPLC.

Waters is committed to working with you to gain insight into your daily challenges and use this understanding to direct our technology development efforts. We remain the only company that can offer you a comprehensive set of technologies for UPLC with one goal in mind: to get you quality information — faster.

UPLC is here to stay and we are confident it will continue to have a lasting impact in labs around the globe.



**Art Caputo**  
President, Waters Division  
Waters Corporation

# PREFACE

**W**e hope you find this special Ultra Performance Liquid Chromatography supplement to *LCGC* useful and informative. Each of the manuscripts presents a unique view and use of this exciting new technology.

The first article serves as an introduction, highlighting the theory and implementation of UPLC, including the technological strides necessary in chemistry and instrumentation in order to capitalize on UPLC's increased speed, sensitivity, and resolution. The article goes on to describe how UPLC can be used in both drug discovery (in-vitro metabolism) and environmental applications.

The next article describes the use of UPLC in pharmaceutical development. The benefits of fast method development increasing sample throughput and laboratory productivity, and an example of an eight-fold reduction in analysis time, without compromising resolution, are reported.

The third article further investigates drug discovery applications, with UPLC coupled to orthogonal quadrupole time-of-flight-mass spectrometry (TOF-MS). The authors show significant gains afforded by UPLC over conventional capillary-scale liquid chromatography-mass spectrometry (LC-MS) for metabolite identification and MS spectral quality.

In the next article, an HPLC assay is converted and optimized for UPLC, achieving both higher sample analysis throughput and better assay sensitivity. A general strategy for method conversion is summarized, and an analysis of operation costs and sample throughput found UPLC superior to HPLC in the quality control (QC) laboratory.

The fifth article examines the use of 1 minute high-speed UPLC separations for dose formulation strength analysis. The chromatographic parameters evaluated include retention time and peak reproducibility, as well as resolution and column ruggedness in isocratic and gradient separations.

The final article provides details on the considerations taken when developing a new chromatographic particle for UPLC separations. Information on column stability under aggressive testing conditions is included. Additionally, information on several new column chemistries to provide the utmost flexibility for methods development is reported.

Also included in this supplement is an up-to-date bibliography of published UPLC references the reader can consult for more information.

At a time when many scientists have reached separation barriers with conventional HPLC, UPLC presents the possibility to extend and expand the utility of chromatography and obtain quality results faster, redefining separation science.

Your comments and thoughts are always welcome.



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