



**ThermoFisher**  
S C I E N T I F I C

## Simple to the CORE

Introduction of the Thermo Scientific™ Vanquish™ Core HPLC System

Dr. Alexandra Manka

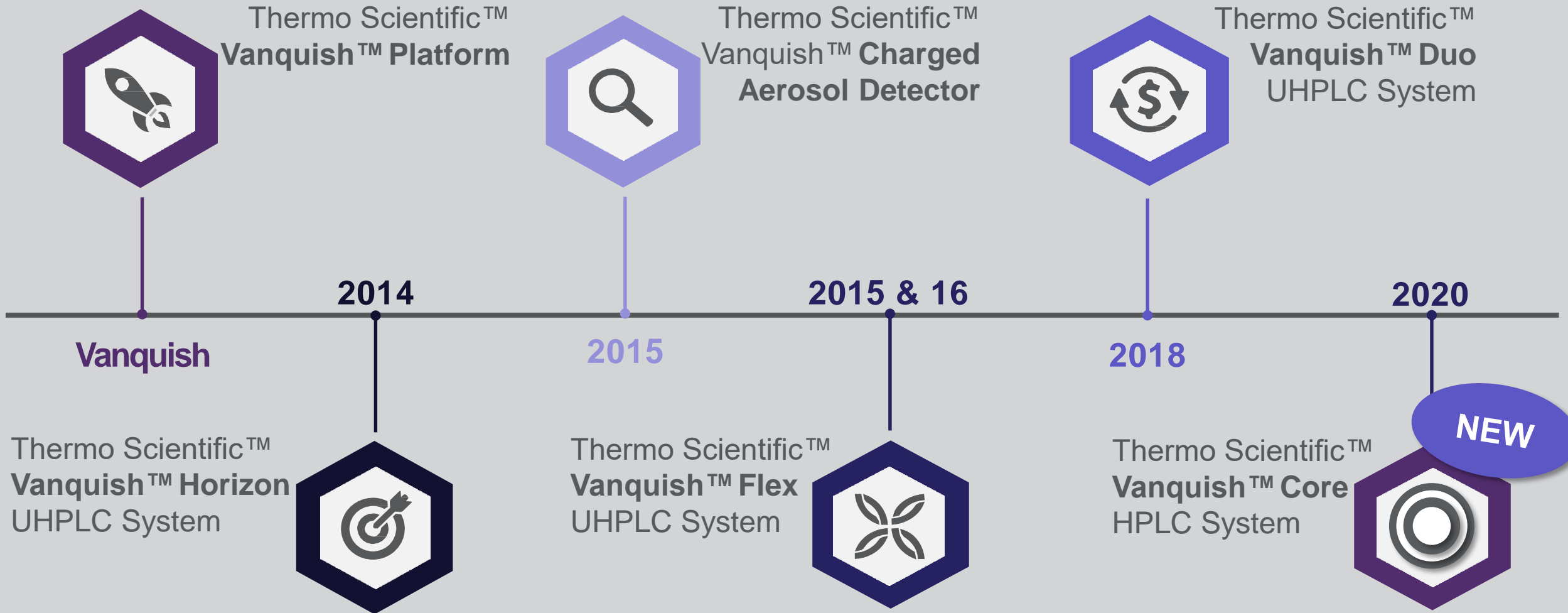
Technical Sales Manager HPLC

The world leader in serving science

# Thermo Scientific Vanquish Portfolio



# Thermo Scientific Vanquish UHPLC Platform History



# Thermo Scientific Analytical LC Portfolio Overview

Routine Analysis

Method Development

Research & HT

HPLC Systems

UHPLC Systems

Thermo Scientific™  
UltiMate™ 3000 Basic  
Automated System



Thermo Scientific™  
UltiMate™ 3000 SD  
System



Thermo Scientific  
Vanquish Core HPLC  
System



NEW

Thermo Scientific™  
UltiMate™ 3000 RS/  
BioRS System



Thermo Scientific  
Vanquish Flex UHPLC  
System



Thermo Scientific  
Vanquish Horizon  
UHPLC System



620 bar

700 bar

1000 bar

1500 bar

# Thermo Scientific Vanquish HPLC and UHPLC Family

**Future-  
proof,  
versatile,  
integrated**

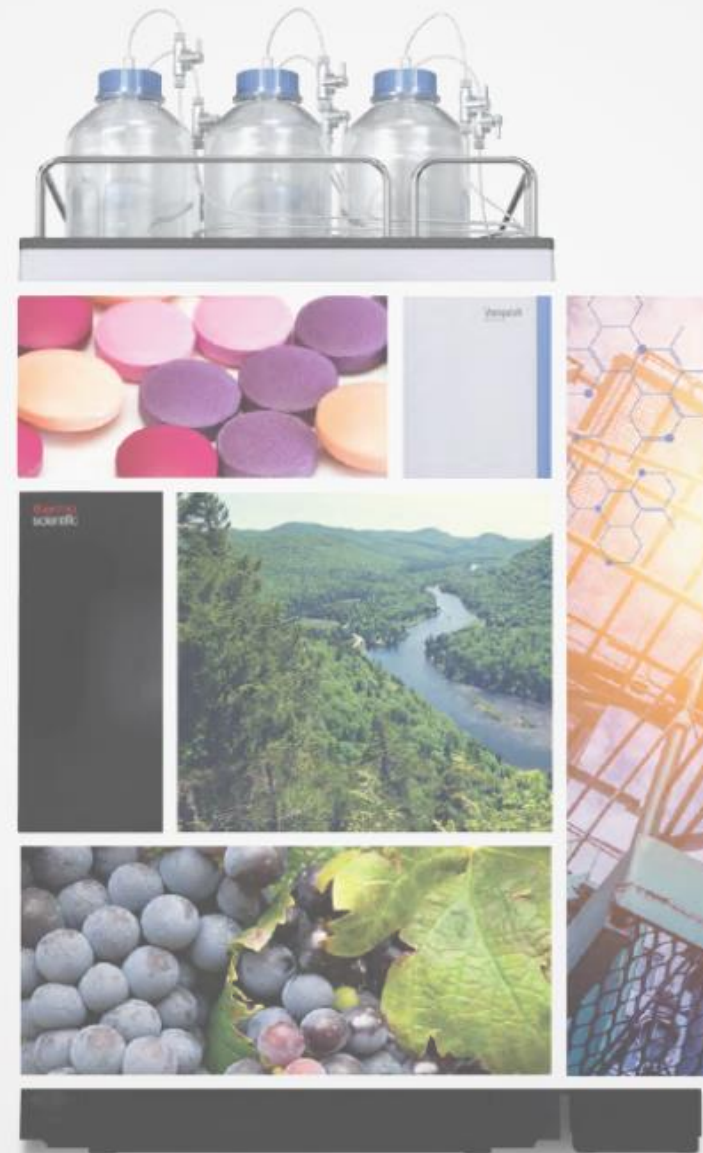
solution for all  
HPLC, UHPLC,  
and LC-MS  
workflows

**Rapid &  
robust**

delivery of the  
most consistent  
and reproducible  
results

**Minimal user  
intervention**

or experience  
needed for  
reliable operation





# The Thermo Scientific Vanquish Platform

## Dependability



Vanquish Core

## Flexibility



Vanquish Flex

## Productivity



Vanquish Duo

## Performance



Vanquish Horizon

# Major Differentiators

Routine	Method Development	High-throughput	Research
Vanquish Core	Vanquish Flex	Vanquish Duo	Vanquish Horizon
<ul style="list-style-type: none"> <li>• Lower-cost HPLC</li> <li>• Easy method transfer</li> <li>• High productive time</li> </ul>	<ul style="list-style-type: none"> <li>• Flexible UHPLC</li> <li>• High performance</li> <li>• LC-MS solutions</li> <li>• Biocompatible</li> </ul>	<ul style="list-style-type: none"> <li>• Multiple solutions</li> <li>• Space saving</li> <li>• Complementary dual LC</li> <li>• LC-MS solutions</li> </ul>	<ul style="list-style-type: none"> <li>• Top-performing UHPLC</li> <li>• Most sensitive detection</li> <li>• Highest gradient precision</li> <li>• LC-MS solutions</li> <li>• Biocompatible</li> </ul>
Control under Empower			
Dependability	Flexibility	Productivity	Performance

# Thermo Scientific Vanquish Systems

## Performance



### To improve separations

- Unique pumping portfolio with binary, ternary, quaternary, isocratic and dual pumps

## Sensitivity



### To find the complete picture

- Diverse detector portfolio to provide highly sensitive and selective detection
- Unique near universal charged aerosol detection

## Productivity



### To get more done

- Charger Module extends capacity
- Thermo Scientific™ Chromeleon™ Chromatography Data System (CDS) Software



## Accuracy

### To control experiments

- Unsurpassed sample dosage
- Active and passive pre-heating
- Multiple thermostating options



## Confidence

### To ensure highest data quality

- Unmatched retention time precision with *SmartInject*
- Automation of workflows with barcode reading and liquid handling



## Flexibility

### To grow with your research

- Tool-free set up by default with optimized fluidics
- Integrated modularity – swap modules

# Innovation in every aspect



# Strong Reputation in Research & Development Organizations

“They really made efforts to move the technology significantly forward.”

Prof. Christian Huber, University of Salzburg

“One of the key features for us is really the simplicity of use. “

Dr. Jonathan Bones, NIBRT

“The Vanquish CAD system is intuitive to work with and requires minimal maintenance, which gives it potential to be used by industry for in-house testing ”

Hilary Green, UC Davis

“The instrument offers a fantastic increase in throughput when running two different separation chemistries, enabling us to generate large amounts of characterization data”

Dr. Jonathan Bones, NIBRT

“Since installing the Tandem LC-MS system we have doubled our throughput and increased the precision of our data!”

Dr. Richard Rogers, Just Biotherapeutics



# New Thermo Scientific Vanquish Modules Overview

## User Interface

- Intuitively monitor system status & health
- View maintenance videos

## Detectors

DAD, MWD, VWD, FLD

- Highly linear DAD & MWD
- Sensitive VWD & FLD
- CAD & ISQ optional additions

## Pumps

LPG, HPG, DGP, ISO

- HPG with improved performance
- Automatic purging

## Solvent Monitor

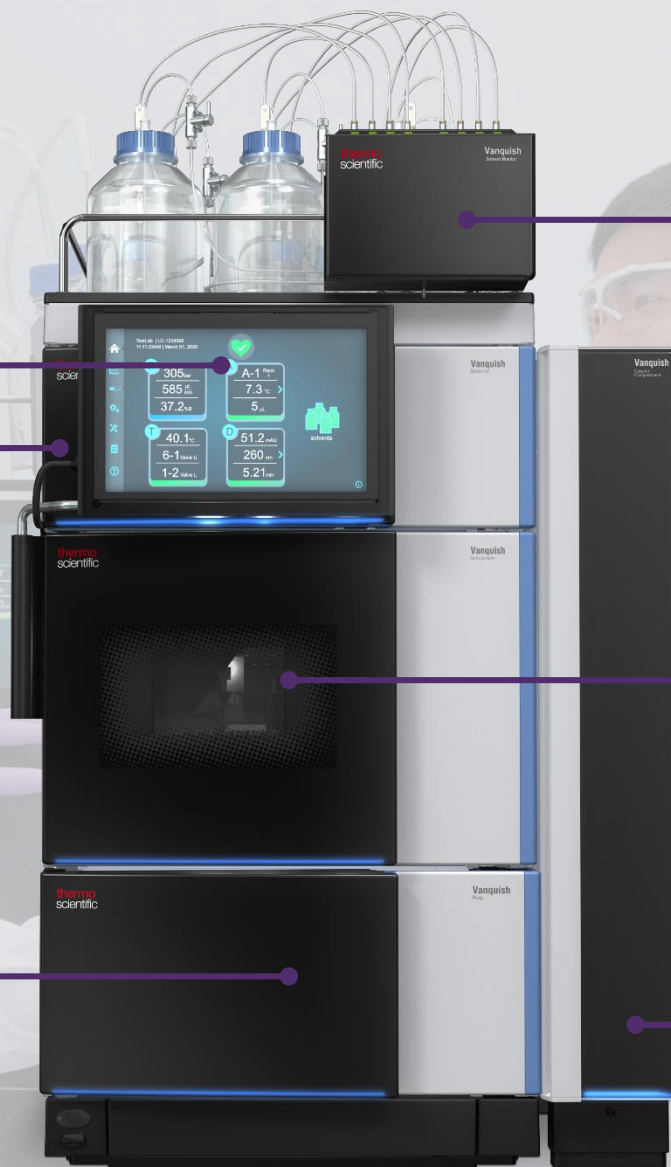
- Monitors solvent & waste level of up to 8 solvents
- Prediction of estimated solvent consumption

## Autosampler

- Cooled or non-cooled
- Tunable GDV
- Up to 1 mL injection volume
- Liquid handling

## Column Compartment

- Up to 85 °C
- Optional active pre-heating
- Method transfer kit





# Thermo Scientific Vanquish Core HPLC System



Enable scientists to continually deliver exceptional results



Enhance your lab's productivity with system intelligence

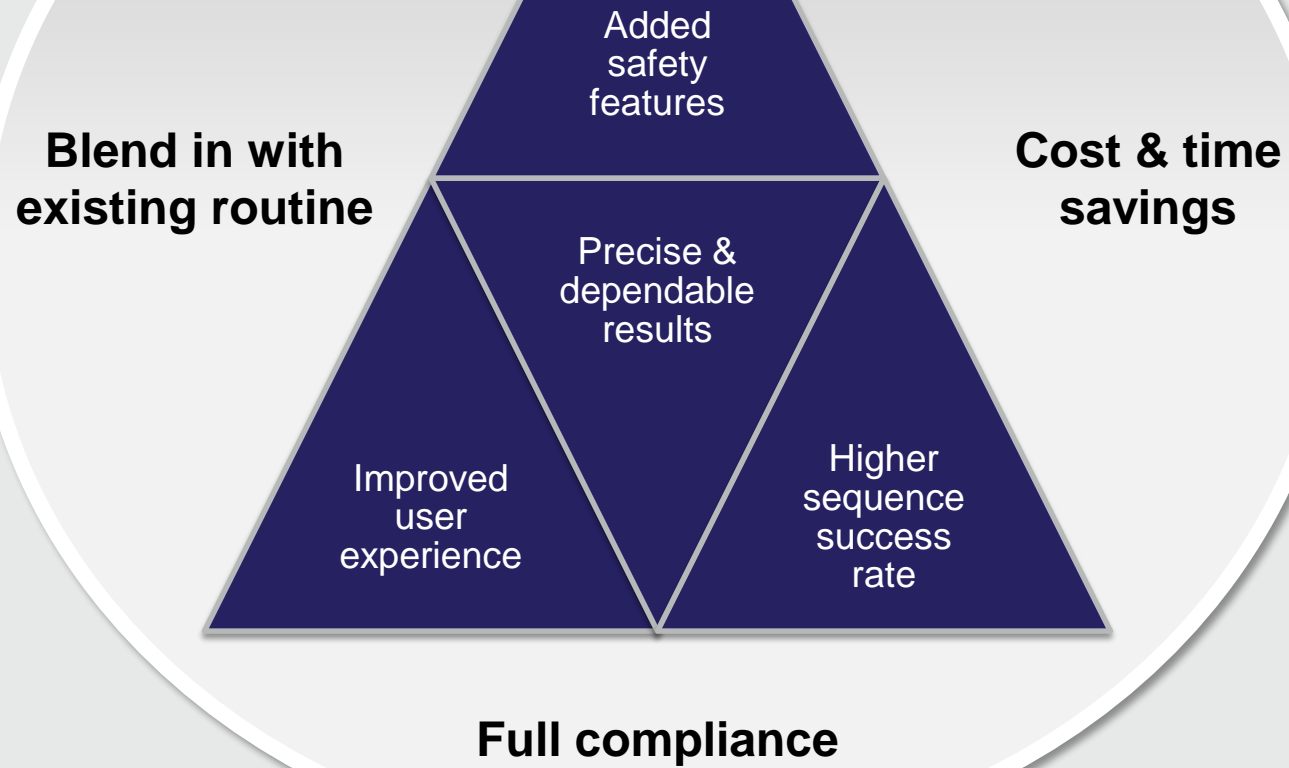


Upgrade your systems within your current software infrastructure

## Simple to the **CORE**

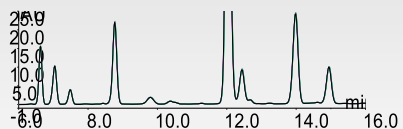
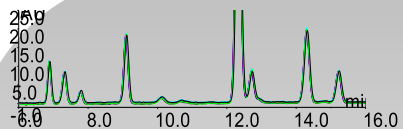


# Thermo Scientific Vanquish Core System Delivers





# Pump & Sampler Performance



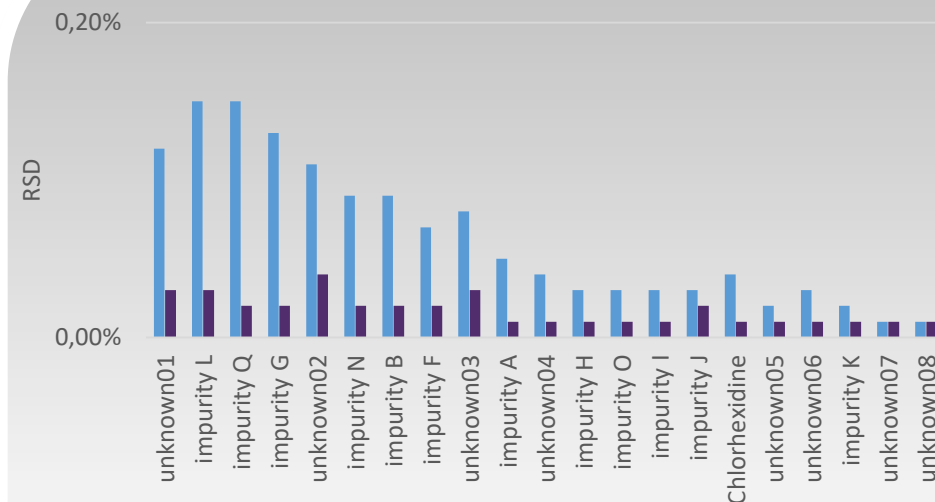
Competitor  
instrument



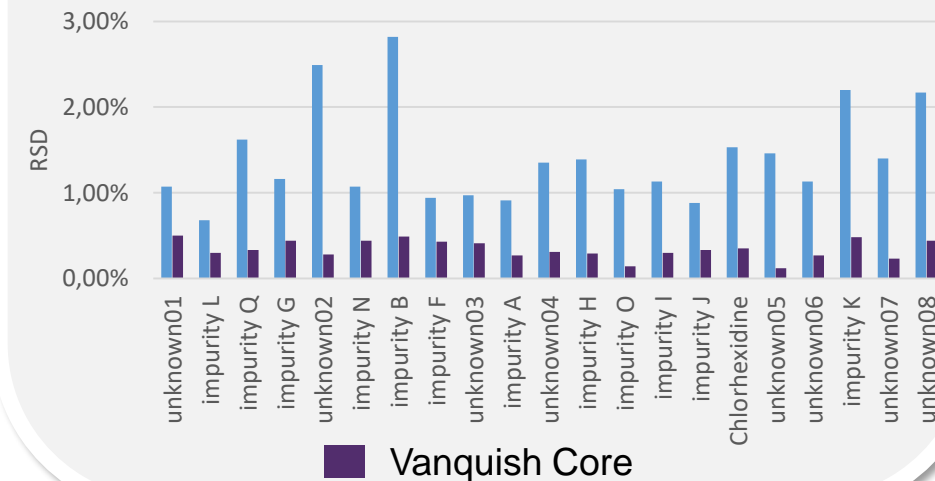
## More Confidence

Precise and dependable results by  
better run-to-run repeatability compared to competition

### RSD Retention Time



### RSD Area

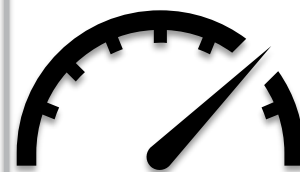


Vanquish Core

## Vanquish Split Samplers



## Benefits



### Time & cost efficiency

No time loss or costs for maintenance

### More confidence

Precise & dependable results  
No sample contamination



### Less paperwork

No need to justify out-of-specification results  
& repeat sequences

**Minimized downtime & more dependable results**

# Thermo Scientific Vanquish User Interface • Home Screen

## Vanquish System Controller Information

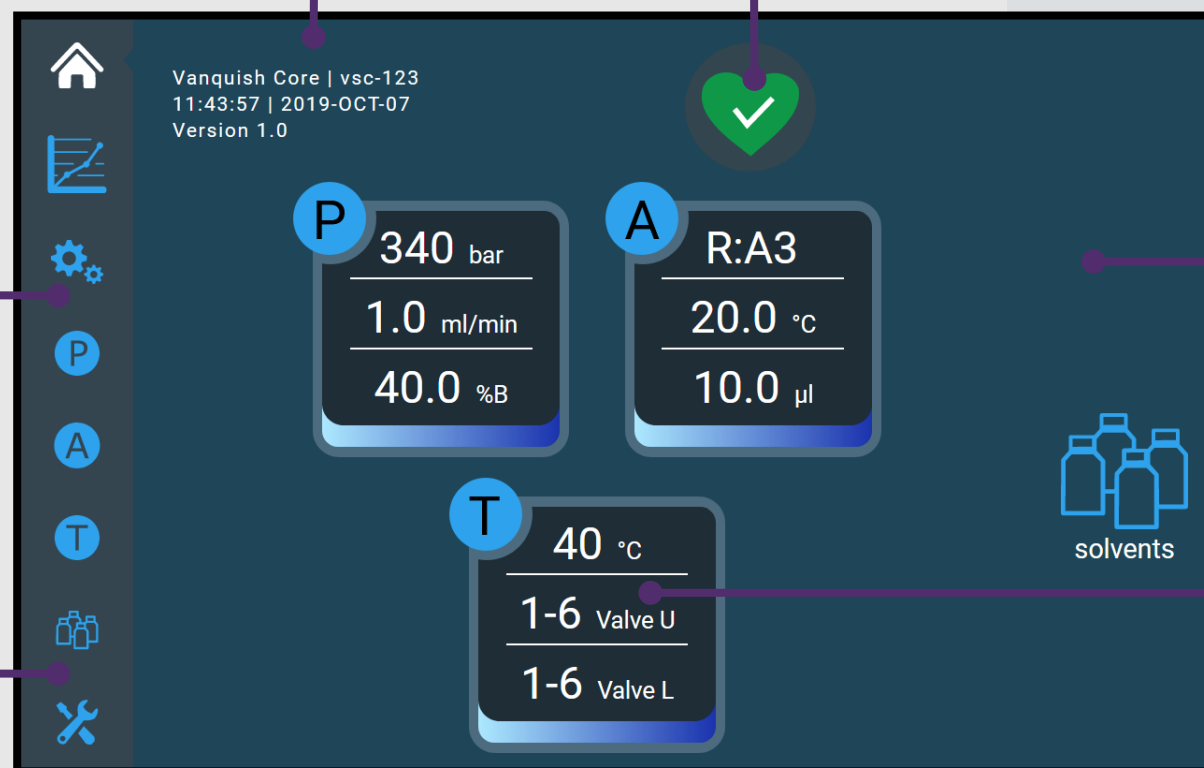
## Navigation Bar

## Maintenance Videos

## Health Status

## Fully Compliant

## Module Information



Easy Access to Instrument Parameters

# Thermo Scientific Vanquish Solvent Monitor (VSM)



- Live measurement of mobile phase consumption & waste accumulation
- Automatic recording of eluent bottle refill in the audit trail
- 4-channel & 8-channel version

## Benefits



Avoid time lost & additional costs

Enhanced Safety Features



Less paperwork



System installation

Schedule test

Cycle & plan

Set & forget



System in use

Care-free operation



System idle

Tests running  
in background

Notifies  
you if necessary

Review results  
w/ build-in report

Minimizes Unplanned Downtime





## Available tests • Chromeleon CDS 7.3

Basic  
tightness  
test

Lamp  
intensity  
test

Shutter  
motor  
test

Grating  
motor  
test

## Benefits

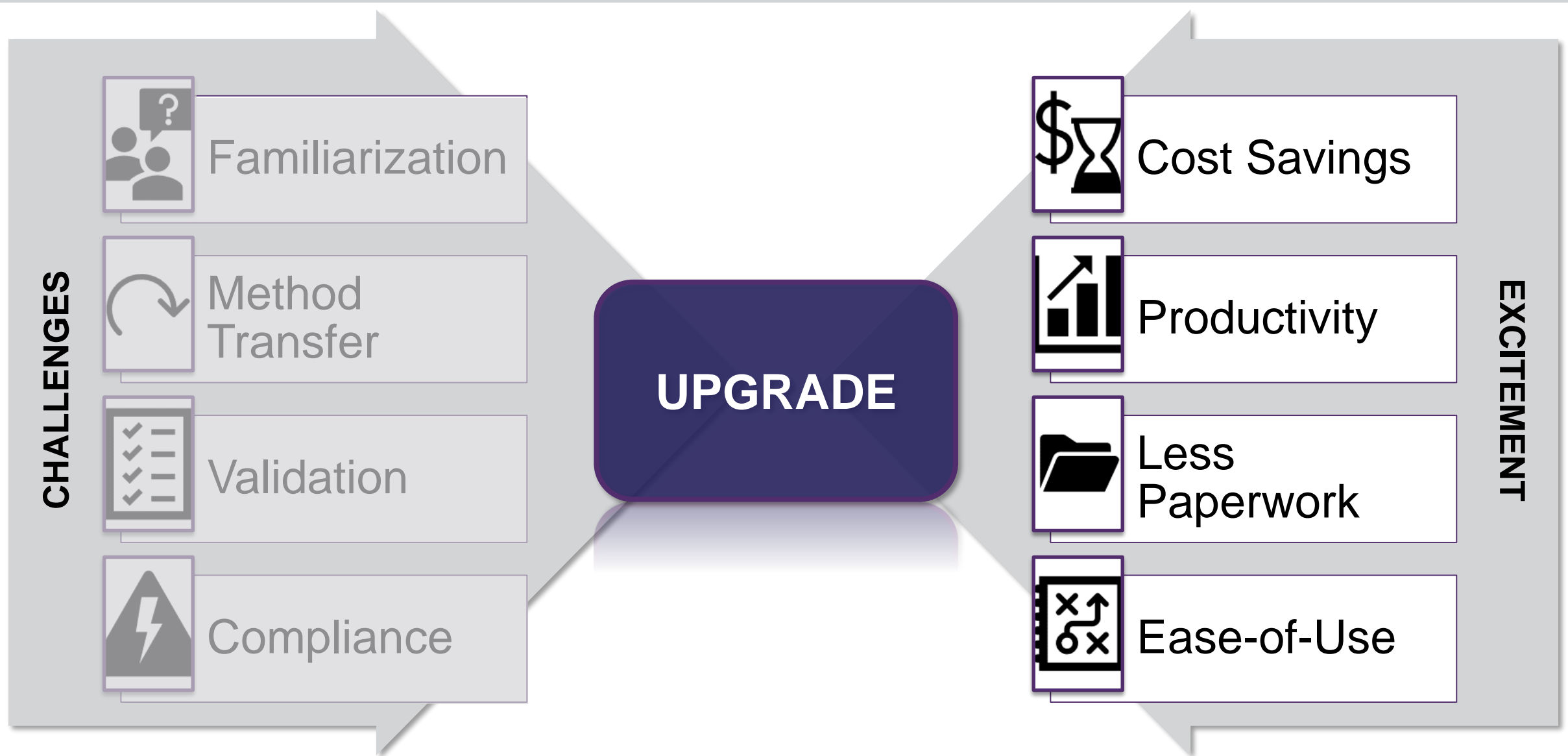
### Less downtime

Accelerated troubleshooting & system  
performance checks after maintenance & repair

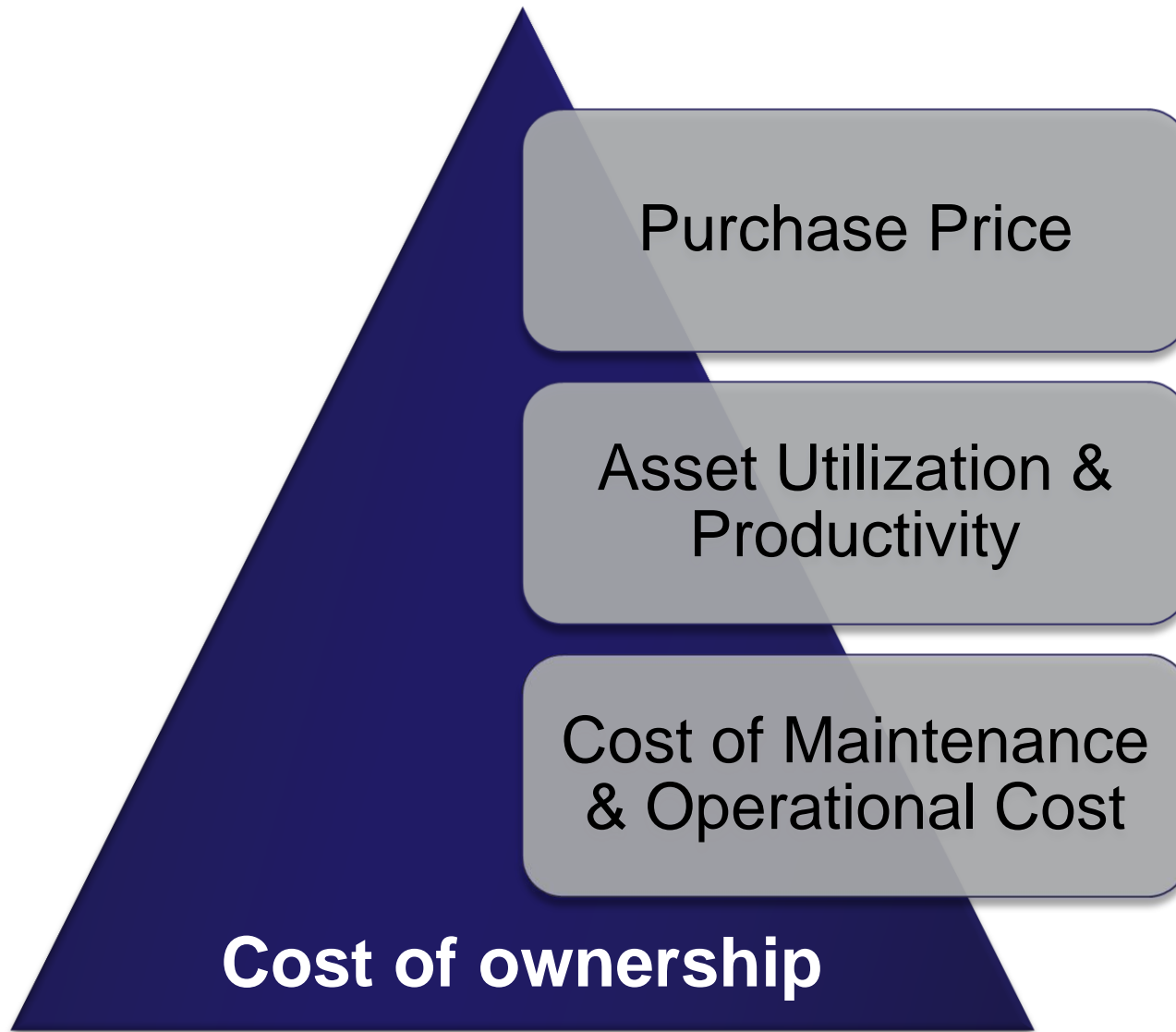


# Innovation & Profitability in Routine HPLC



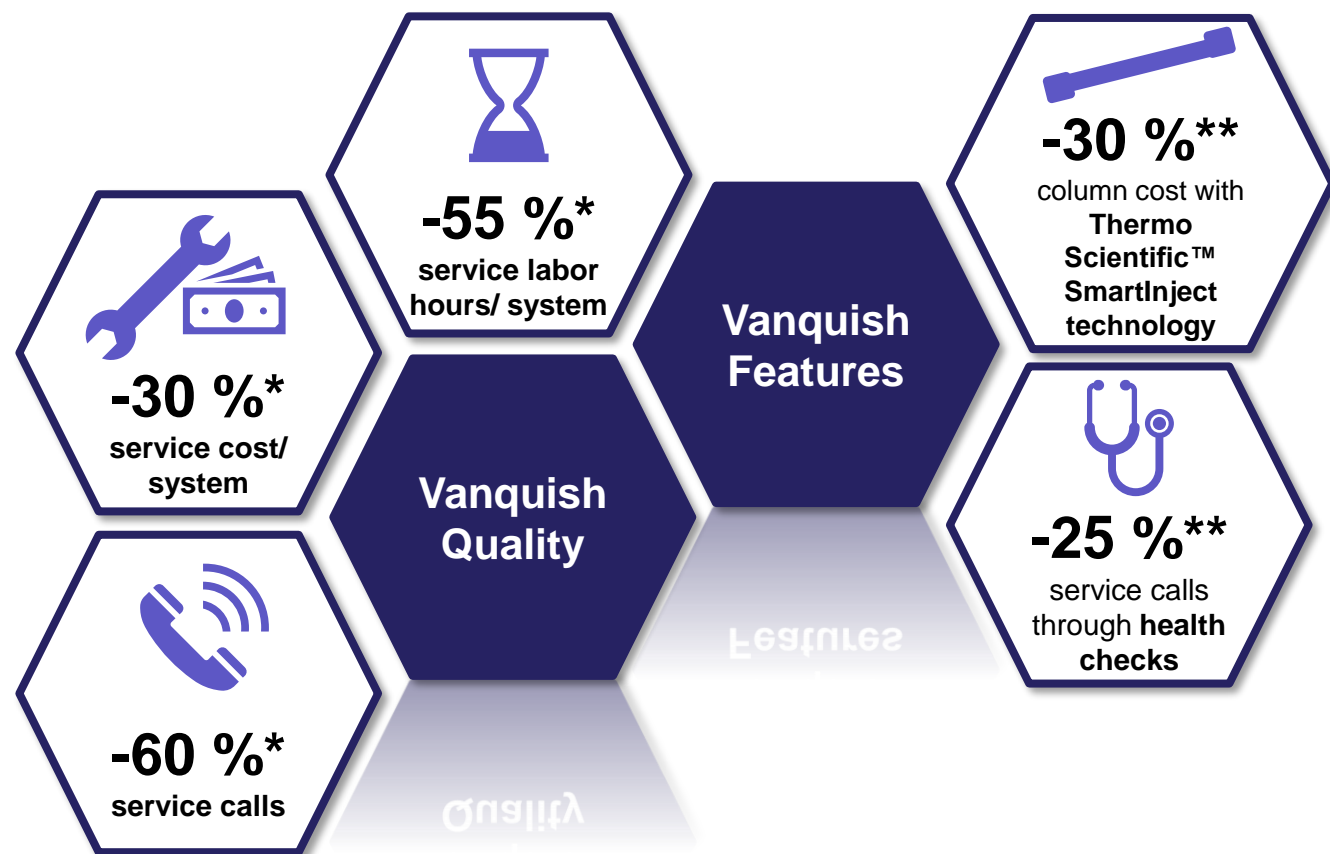


# Increasing Profitability with Thermo Scientific Vanquish Core System





# Reducing Cost of Maintenance & Operational Cost



\* Compared to other LC systems on the market

\*\* For details refer to WP73373



## Reduces Downtime & Cost



# Uptime is Key to Productivity



\*)For details refer to WP73373

## Get More Work Done with Vanquish Core

# Reducing Deviations • Less Paperwork



Inaccurate  
Instruments

Bad  
reproducibility

Adding  
complexity

Vanquish Core delivers  
analytical consistency & reproducibility for

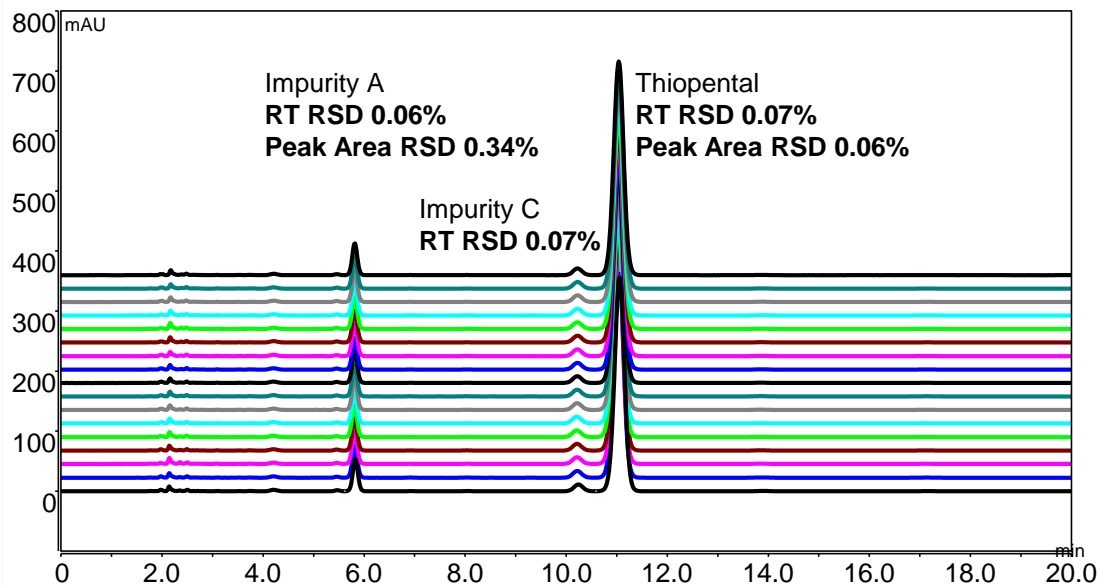
**Highest confidence in your results**  
**day-to-day • system-to-system • lab-to-lab**

Justification of deviations needed



## Long-term stability of results

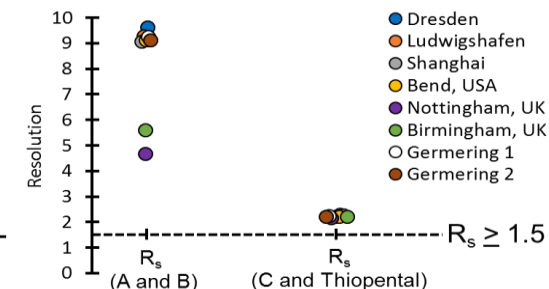
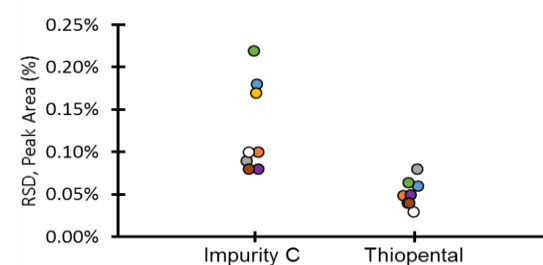
More than 170 injections – 3 days 24/7 operation



**Excellent long-term retention time  
& area reproducibility**

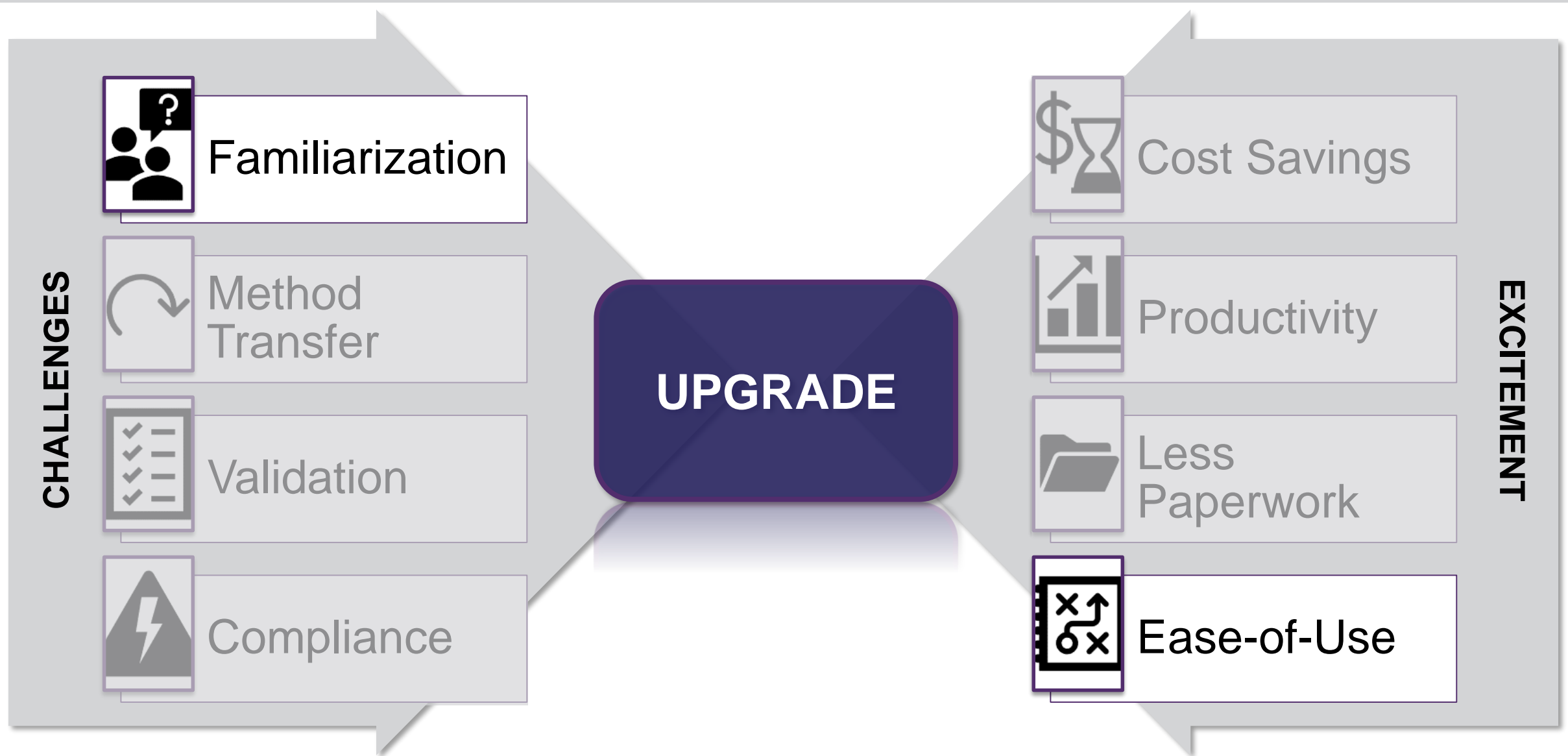
## Inter-system reproducibility

**8 systems in 7 labs  
around the globe**



**All systems passed SST  
with remarkable reproducibility**

**Robust Workhorse for Routine Labs • Everyday Confidence**



## Clear instrument setup

- See & understand the setup at a glance

## Simple to operate

- Easy access to instrument parameters & videos

## Rapid instrument troubleshooting

- Guided diagnostics

## Easy to service

- Easy access to all instrument components
- Drawer design

## Added safety features

- Waste level monitoring



**User Friendly Design for Easiest Onboarding**





Cost & time savings



Lower risk of human error



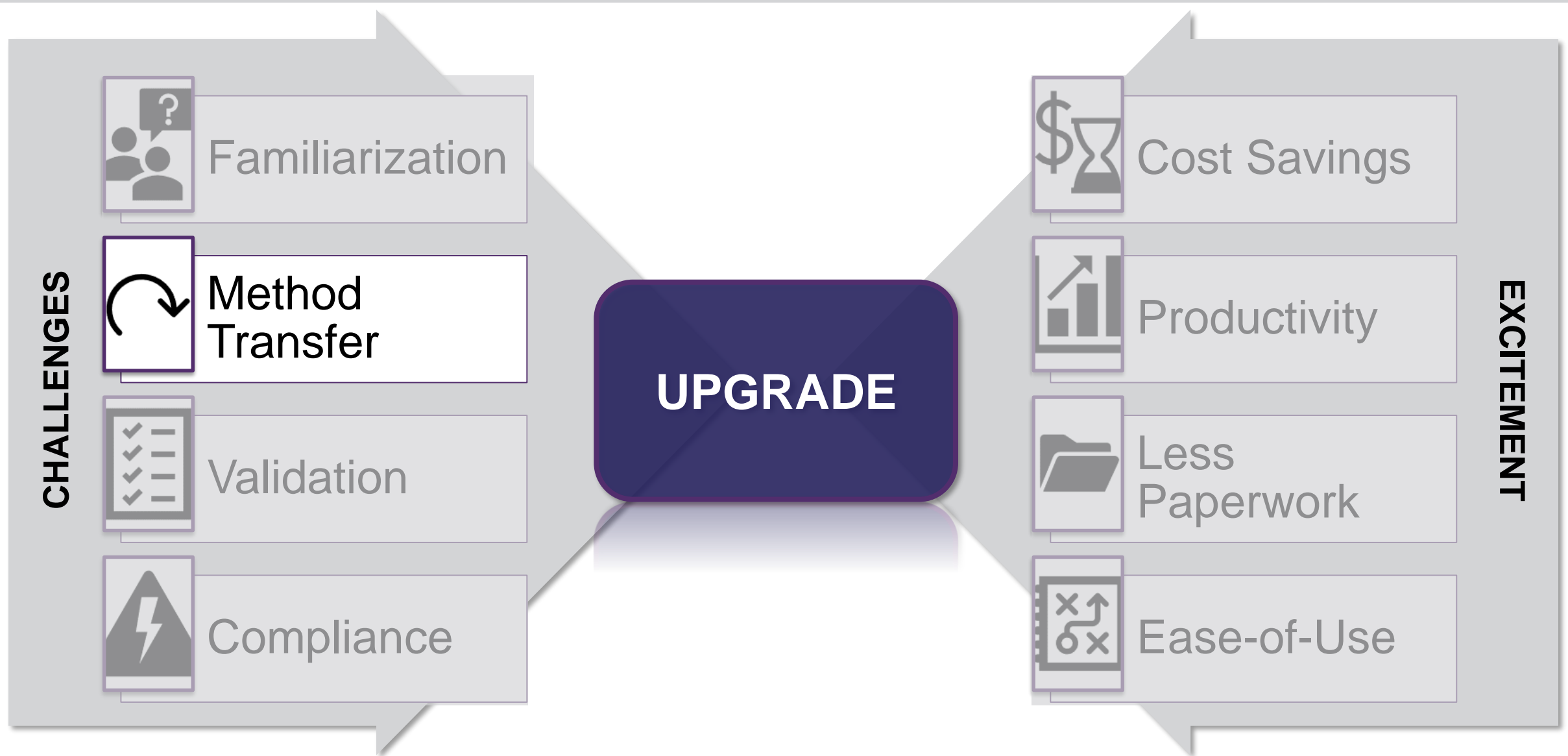
Cost and time spend on  
Service



Safe working environment



Simple to the Core



## Common aspects

- GDV variation
- Thermostating
- Dispersion & solvent effects



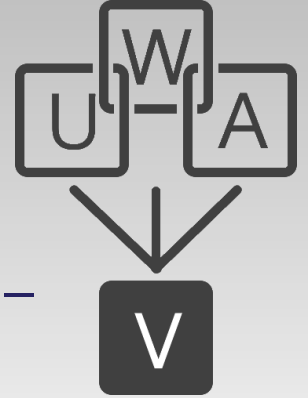
## Pain points

- Time & resource consuming
- No systematic approach



## GDV adjustment

- Tunable gradient delay volume
- Optional kit adding larger GDV – up to 430  $\mu\text{L}$



## Flexible Thermostating



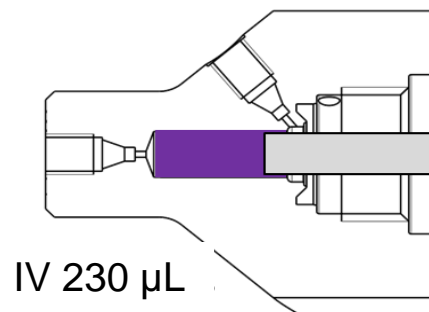
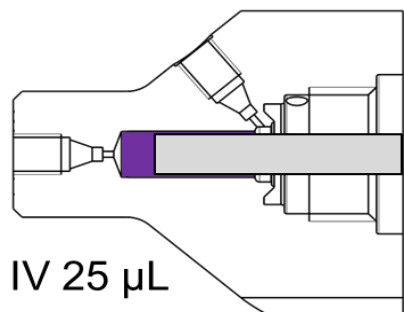
## Custom injection programs (UDPs)



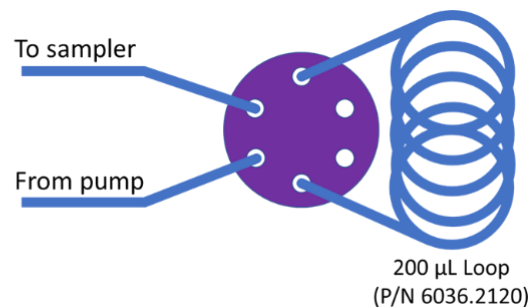
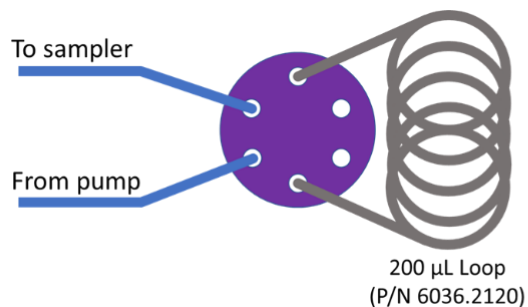
## Clear guidelines

Ensure Chromatograms Look Exactly the Same

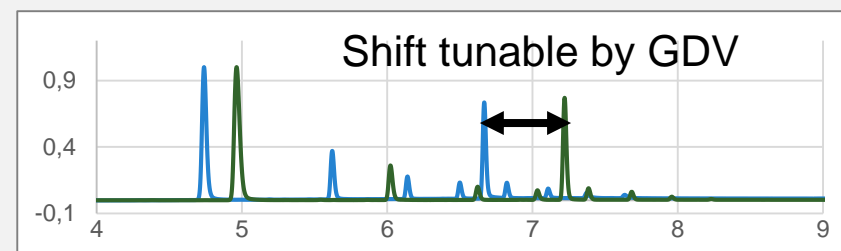
**Metering device idle volume • 25 – 230  $\mu\text{L}$**



**Method transfer kit • 200  $\mu\text{L}$**

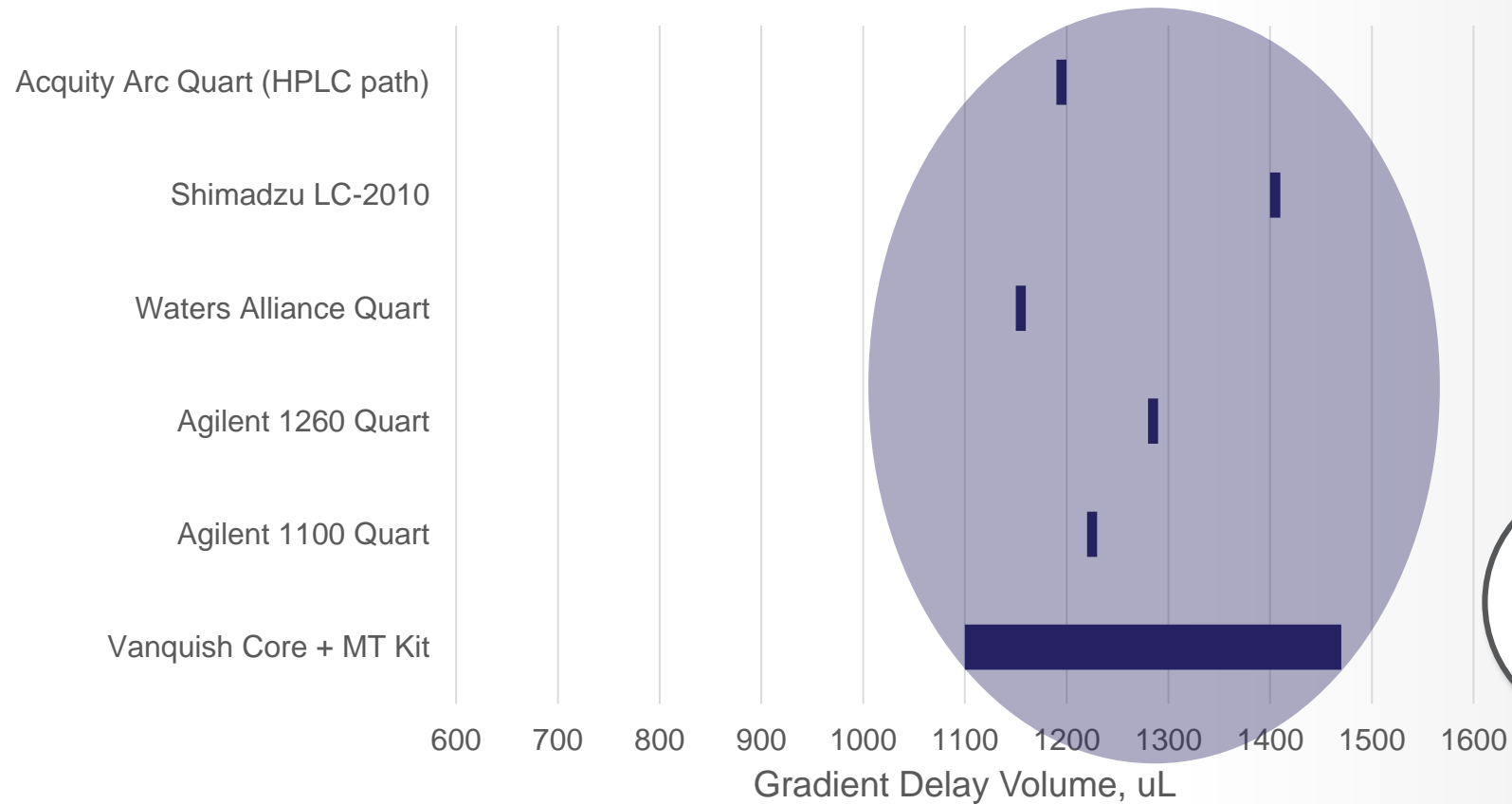


- No changes to hardware setup
- Simple setup & use with Chromeleon
- Full compliance by audit trail & qualification



## Method Transfer without Re-validation

## GDV comparison • LPG-type Systems



**Mimic the Setup of Any LC on the Market**





## Relevant Parameters

- Column compartment temperature
- Eluent pre-heating (non, passive, active)
- Operating mode (Still air / forced air)

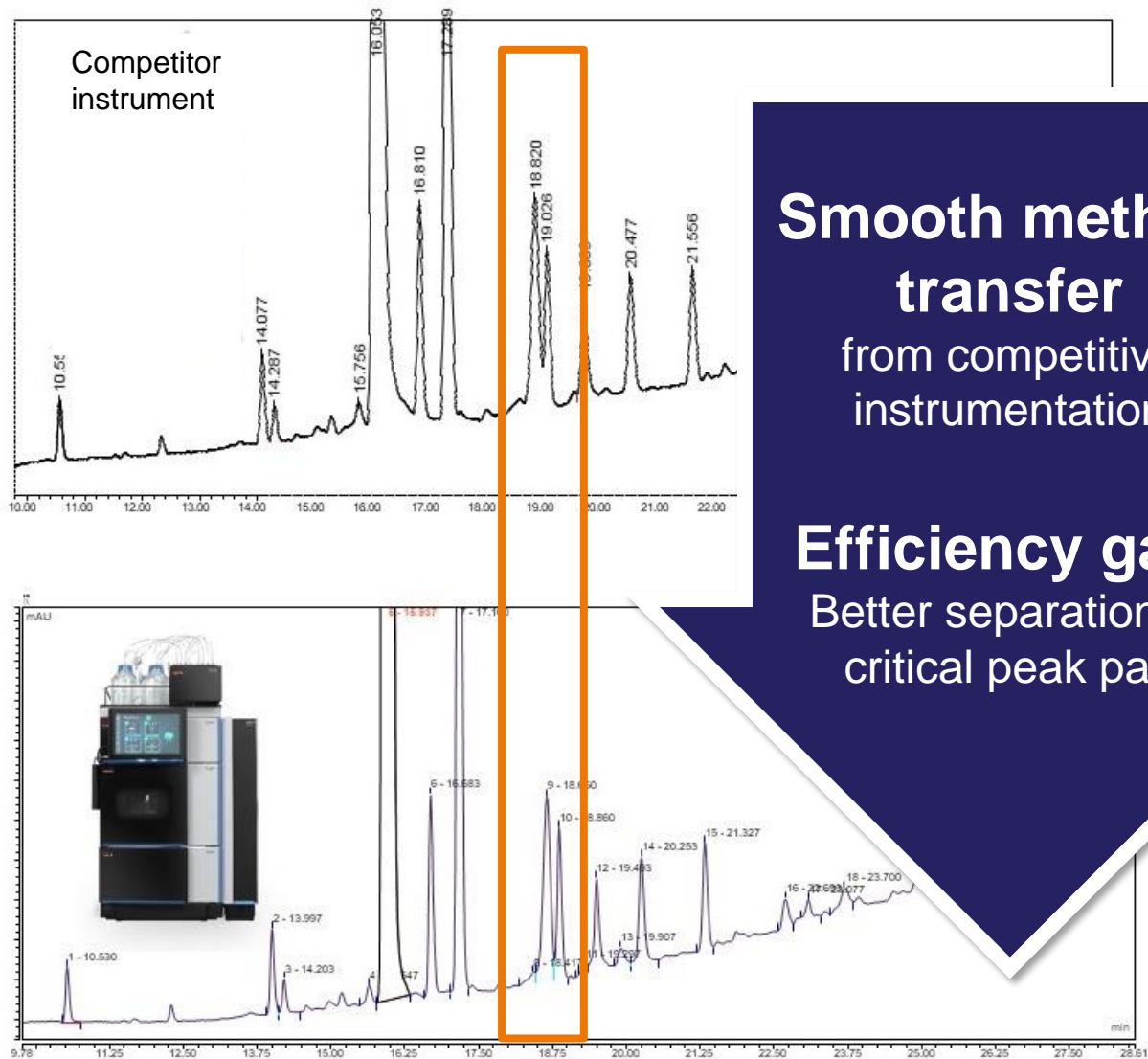


## Vanquish Core delivers

- Wide temperature range up to 85 °C
- Two eluent pre-heating options
- Forced air & still air thermostating



# Method Transfer • Thermo Scientific Vanquish Core System Beta-testing



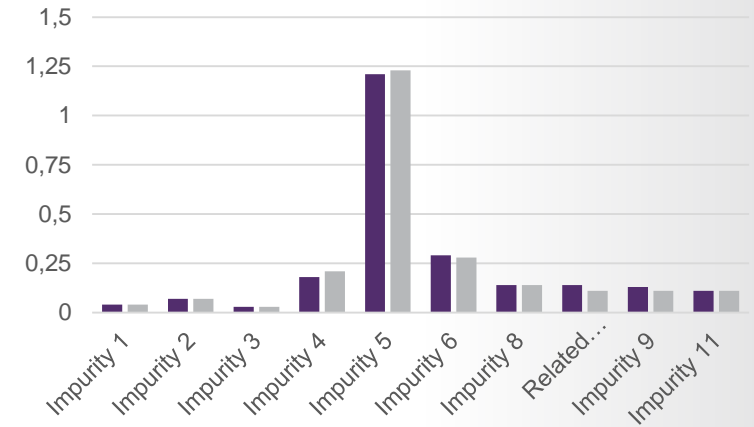
**Smooth method transfer**

from competitive instrumentation

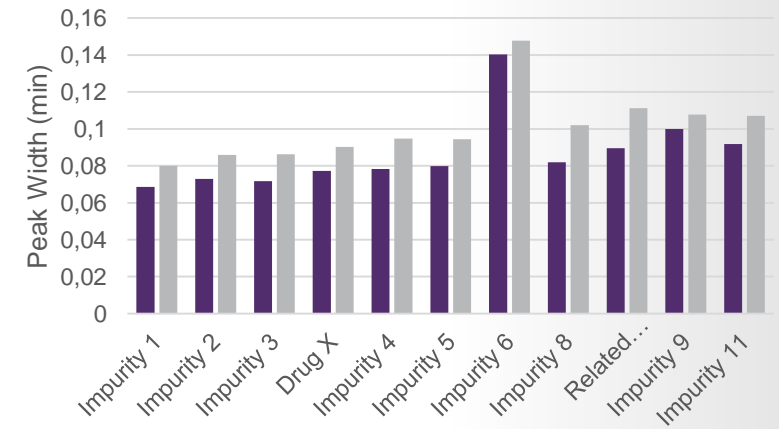
**Efficiency gain**

Better separation of critical peak pair

Relative Peak Area Comparison



Peak Width Comparison



**Vanquish Core**

# Thermo Scientific Vanquish Core System • Method Transfer Made Simple

Years of  
experience

Built-in  
transfer  
capabilities

Clear  
guidelines

**thermo scientific**

**Seamless transfer of a compendial LC method for impurity analysis of chlorhexidine from an UltiMate 3000 Standard HPLC system to a Vanquish Core HPLC system**

Author: Maria Grüner  
Thermo Fisher Scientific, Germering, Germany  
Keywords: HPLC method transfer, Vanquish Core HPLC System, UltiMate 3000 Standard HPLC system, chlorhexidine, European Pharmacopoeia

**Application benefits**

- Straightforward transfer of an EP monograph HPLC method from a Thermo Scientific™ UltiMate™ 3000 Standard HPLC system to a Thermo Scientific™ Vanquish™ Core HPLC system is demonstrated.
- Equivalent chromatographic results are obtained with both systems, but an improved resolution and retention time stability are provided by the Vanquish Core HPLC system.

**Goal**

To demonstrate the transfer of analytical HPLC methods from an UltiMate 3000 Standard HPLC system to a Vanquish Core HPLC system.

**Introduction**

Instrument-to-instrument transfer of LC methods is a challenging task. Laboratories face frequently under-optimized, or even non-compliant, methods. On the other hand, in many laboratories, method development and validation tasks are outsourced, for example, to contract laboratories.

**thermo scientific**

**Straightforward transfer of an EP method for impurity analysis of chlorhexidine from an Agilent 1260 Infinity LC system to a Vanquish Core HPLC system**

Author: Maria Grüner  
Thermo Fisher Scientific, Germering, Germany  
Keywords: HPLC method transfer, Vanquish Core HPLC System, Agilent 1260 Infinity LC system, chlorhexidine, European Pharmacopoeia

**Application benefits**

- Easy transfer of an EP monograph HPLC method from an Agilent™ 1260 Infinity LC system to a Thermo Scientific™ Vanquish™ Core HPLC system is demonstrated.
- Enhanced hardware features of the Vanquish Core HPLC system enable flexible adjustments of the overall system gradient delay volume, which facilitates fine-tuning during the transfer.
- Equivalent chromatographic results are obtained with the originating and receiving instrument.

**Goal**

To demonstrate the transfer of analytical HPLC methods from an Agilent 1260 Infinity LC system to the Vanquish Core HPLC system and highlight the easy-to-use gradient delay volume (GDV) features of the Vanquish Core HPLC system.

**Introduction**

Instrument-to-instrument transfer of liquid chromatographic (LC) methods is a challenging task. Most analytical laboratories face frequently under-optimized, or even non-compliant, methods. On the other hand, in many laboratories, method development and validation tasks are outsourced, for example, to contract laboratories.

**thermo scientific**

**Transfer of a compendial LC method for impurity analysis of chlorhexidine from a Waters Alliance HPLC system to a Vanquish Core HPLC system**

Author: Maria Grüner  
Thermo Fisher Scientific, Germering, Germany  
Keywords: HPLC method transfer, Vanquish Core HPLC System, Waters Alliance HPLC system, chlorhexidine, European Pharmacopoeia

**Application benefits**

- Seamless transfer of an EP monograph HPLC method from a Waters™ Alliance™ HPLC system to a Thermo Scientific™ Vanquish™ Core HPLC system is demonstrated.
- Equivalent chromatographic results are obtained with both systems, but improved resolution and system repeatability are provided by the Vanquish Core HPLC system.

**Goal**

To demonstrate the transfer of analytical HPLC methods from a Waters Alliance HPLC system to the Vanquish Core HPLC system.

**Introduction**

Instrument-to-instrument transfer of liquid chromatographic (LC) methods is a challenging task. Most analytical laboratories face frequently under-optimized, or even non-compliant, methods. On the other hand, in many laboratories, method development and validation tasks are outsourced, for example, to contract laboratories.

**thermo scientific**

**Transfer of a Heart Disease Treatment Analysis from an Agilent 1100 System to an UltiMate 3000 HPLC System**

Author: Maria Grüner  
Thermo Fisher Scientific, Germering, Germany  
Keywords: HPLC method transfer, Vanquish Core HPLC System, UltiMate 3000 HPLC system, chlorhexidine, European Pharmacopoeia

**Application benefits**

- Straightforward transfer of an EP monograph HPLC method from an Agilent™ 1100 System to a Thermo Scientific™ UltiMate™ 3000 HPLC system is demonstrated.
- Equivalent chromatographic results are obtained with both systems, but an improved resolution and retention time stability are provided by the Vanquish Core HPLC system.

**Goal**

To demonstrate the transfer of analytical HPLC methods from an Agilent 1100 System to the UltiMate 3000 HPLC system.

**Introduction**

Instrument-to-instrument transfer of liquid chromatographic (LC) methods is a challenging task. Most analytical laboratories face frequently under-optimized, or even non-compliant, methods. On the other hand, in many laboratories, method development and validation tasks are outsourced, for example, to contract laboratories.

**thermo scientific**

**Transferring a Method for the Characterization of PTMs from the UltiMate 3000 BiorS System to the Vanquish Flex UHPLC System**

Author: Maria Grüner  
Thermo Fisher Scientific, Germering, Germany  
Keywords: HPLC method transfer, Vanquish Flex UHPLC System, UltiMate 3000 BiorS System, PTMs, chlorhexidine, European Pharmacopoeia

**Application benefits**

- Seamless transfer of a method for the characterization of PTMs from the UltiMate 3000 BiorS System to the Vanquish Flex UHPLC system is demonstrated.
- Equivalent chromatographic results are obtained with both systems, but an improved resolution and retention time stability are provided by the Vanquish Flex UHPLC system.

**Goal**

To demonstrate the transfer of analytical HPLC methods from the UltiMate 3000 BiorS System to the Vanquish Flex UHPLC system.

**Introduction**

Instrument-to-instrument transfer of liquid chromatographic (LC) methods is a challenging task. Most analytical laboratories face frequently under-optimized, or even non-compliant, methods. On the other hand, in many laboratories, method development and validation tasks are outsourced, for example, to contract laboratories.

**thermo scientific**

**Method transfer of a USP-derived acetaminophen assay from an UltiMate 3000 SD system to a Vanquish Flex UHPLC system**

Author: Maria Grüner  
Thermo Fisher Scientific, Germering, Germany  
Keywords: HPLC method transfer, Vanquish Flex UHPLC System, UltiMate 3000 SD system, acetaminophen, USP, European Pharmacopoeia

**Application benefits**

- Seamless transfer of a USP-derived acetaminophen assay from the UltiMate 3000 SD system to the Vanquish Flex UHPLC system is demonstrated.
- Equivalent chromatographic results are obtained with both systems, but an improved resolution and retention time stability are provided by the Vanquish Flex UHPLC system.

**Goal**

To demonstrate the transfer of analytical HPLC methods from the UltiMate 3000 SD system to the Vanquish Flex UHPLC system.

**Introduction**

Instrument-to-instrument transfer of liquid chromatographic (LC) methods is a challenging task. Most analytical laboratories face frequently under-optimized, or even non-compliant, methods. On the other hand, in many laboratories, method development and validation tasks are outsourced, for example, to contract laboratories.

**thermo scientific**

**Transfer of an EP method for mebendazole from a Waters Acquity UPLC system to a Vanquish Horizon UHPLC system**

Author: Maria Grüner  
Thermo Fisher Scientific, Germering, Germany  
Keywords: HPLC method transfer, Vanquish Horizon UHPLC System, Waters Acquity UPLC system, mebendazole, European Pharmacopoeia

**Application benefits**

- Straightforward transfer of an EP monograph HPLC method from a Waters™ Acquity™ UPLC system to a Thermo Scientific™ Vanquish™ Horizon UHPLC system is demonstrated.
- During method transfer, Vanquish Horizon UHPLC system provides the optimal platform to help to overcome the actual conditions at the origin system.
- Substantive hardware and software design are characterized by speed and precision, which are essential for high-resolution and high-capacity chromatography.

**Goal**

To demonstrate the transfer of analytical HPLC methods from a Waters Acquity UPLC system to the Vanquish Horizon UHPLC system and highlight the easy-to-use gradient delay volume (GDV) features of the Vanquish Horizon UHPLC system.

**Introduction**

Instrument-to-instrument transfer of liquid chromatographic (LC) methods is a challenging task. Most analytical laboratories face frequently under-optimized, or even non-compliant, methods. On the other hand, in many laboratories, method development and validation tasks are outsourced, for example, to contract laboratories.

**thermo scientific**

**An instrument parameter guide for successful (U)HPLC method transfer**

Author: Maria Grüner  
Thermo Fisher Scientific, Germering, Germany  
Keywords: HPLC method transfer, Vanquish Core HPLC System, UltiMate 3000 Standard HPLC system, chlorhexidine, European Pharmacopoeia

**Application benefits**

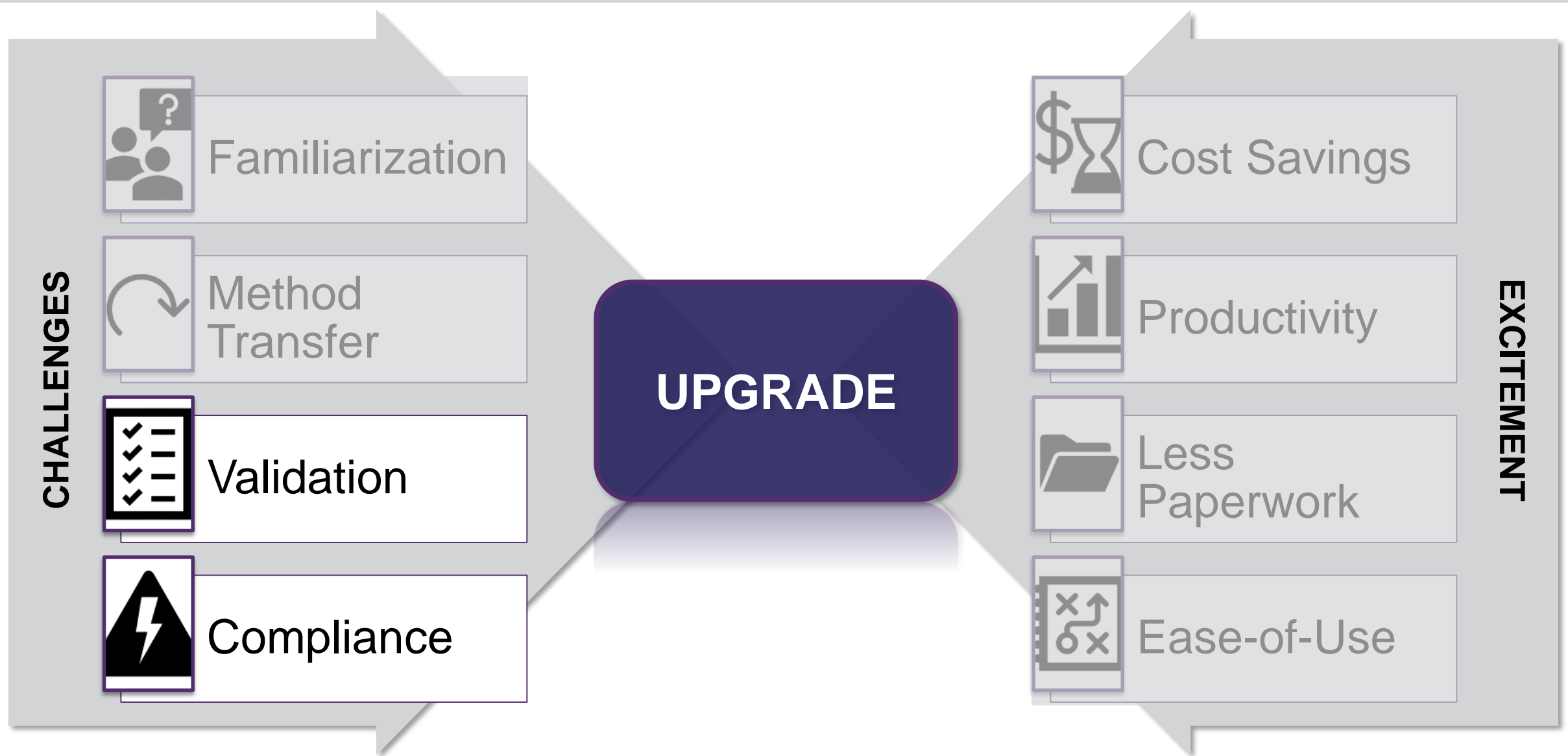
- This guide provides a comprehensive overview of the instrument parameters (HPLC) users need to consider during transfer of an analytical HPLC method between different instruments.
- The transfer of analytical procedures in liquid chromatography (LC) is a regular task in many laboratories. This challenge can be categorized into the following common scenarios:

**Introduction**

The transfer of analytical procedures in liquid chromatography (LC) is a regular task in many laboratories. This challenge can be categorized into the following common scenarios:

- Acceleration of methods, e.g., from HPLC to UHPLC methods
- Method transfer to identical equipment, e.g., to another laboratory
- Method transfer to a non-identical instrument, e.g., to recently purchased system

## Smart & Plannable Method Transfer



# Thermo Scientific Chromeleon CDS for Thermo Scientific Vanquish Core HPLC System

- Chromeleon 7.3 CDS is recommended for Thermo Scientific Vanquish Core HPLC system
  - Vanquish Solvent Monitor – never run dry again!
  - Custom Injection Programs – customized sampling
  - Purge via sampler – convenient purging
  - Multi-draw Injections – large injection volumes
  - Method Translation – automated instrument method translation from Thermo Scientific UltiMate 3000 UHPLC systems
  - Method Transfer – tunable gradient delay volume
  - Compliant Diagnostics – troubleshooting with videos
  - Health Check – scheduled diagnostics





## Chromeleon 7.3 CDS and Vanquish Core HPLC

- Easier adherence to data integrity regulations
  - Faster and easier Review of Audit-Trails
  - Intuitive analysis of result changes with side-by-side result comparison
- Superior Lab Productivity and Highest Uptime
  - Vanquish Solvent Monitor
  - SW guided Method Translation & Method Transfer
  - Analyze and resolve common instrument problems with new instrument diagnostics
  - Reduce unplanned downtime with scheduled Health Checks



# Thermo Scientific Vanquish Core HPLC System



Enable scientists to continually deliver exceptional results



Enhance your lab's productivity with system intelligence



Upgrade your systems within your current software infrastructure

## Simple to the **CORE**



**Thank you for your attention!**

**Questions?**

