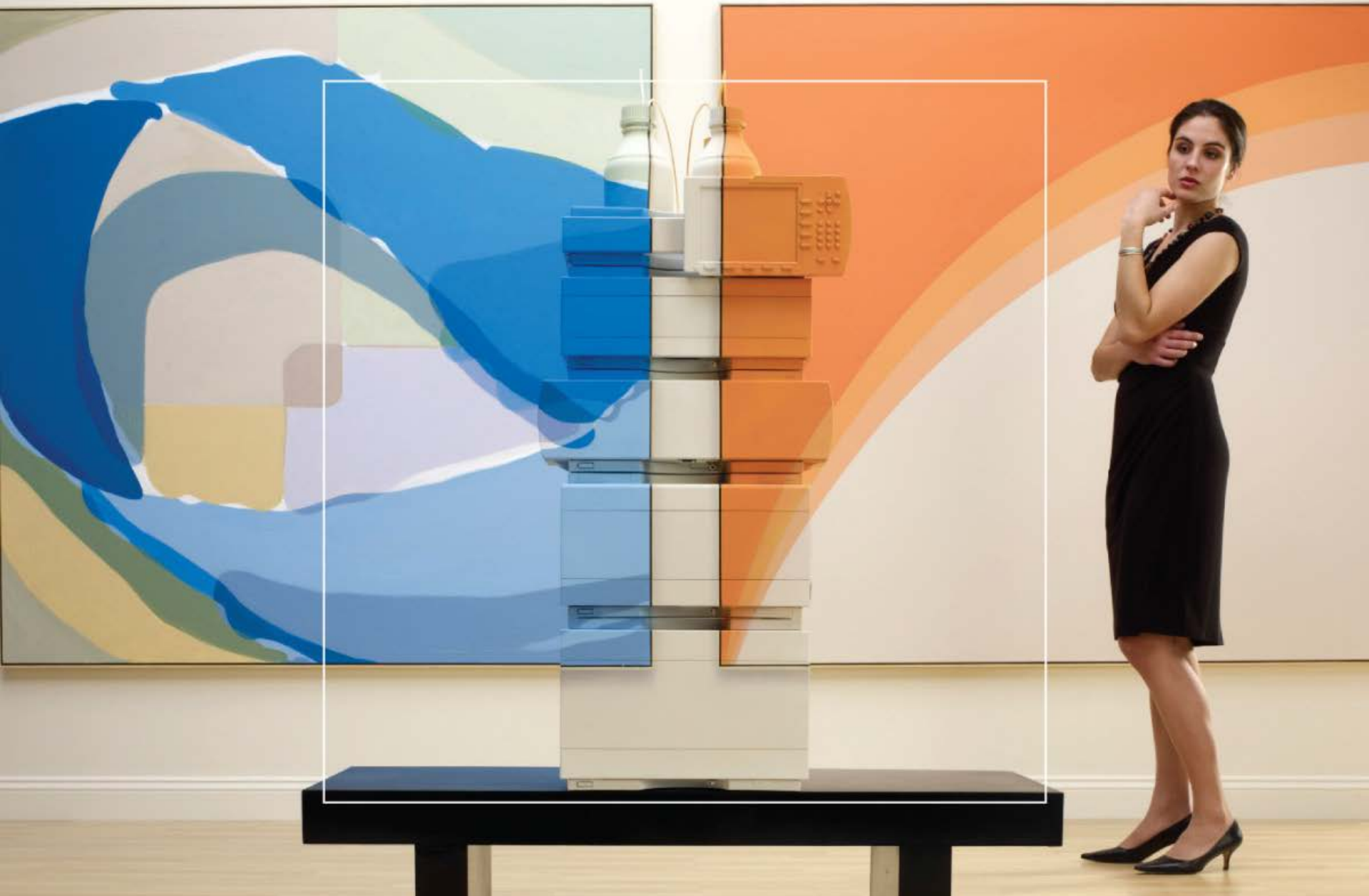
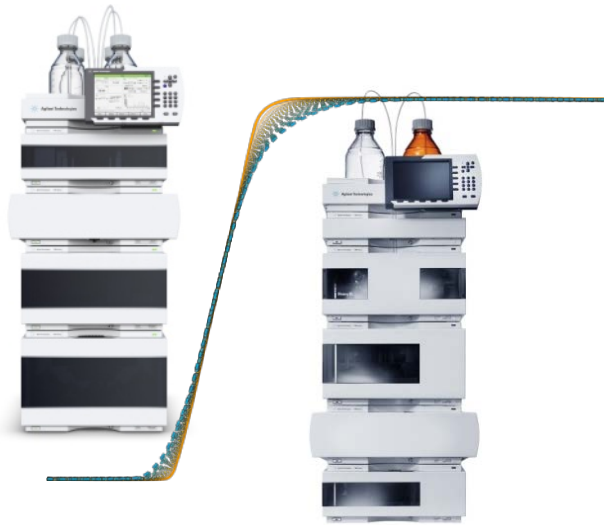


THE ART OF EMULATION



Infinitely better method transfer

Agilent 1290 Infinity with
**Intelligent System Emulation
Technology (ISET)**

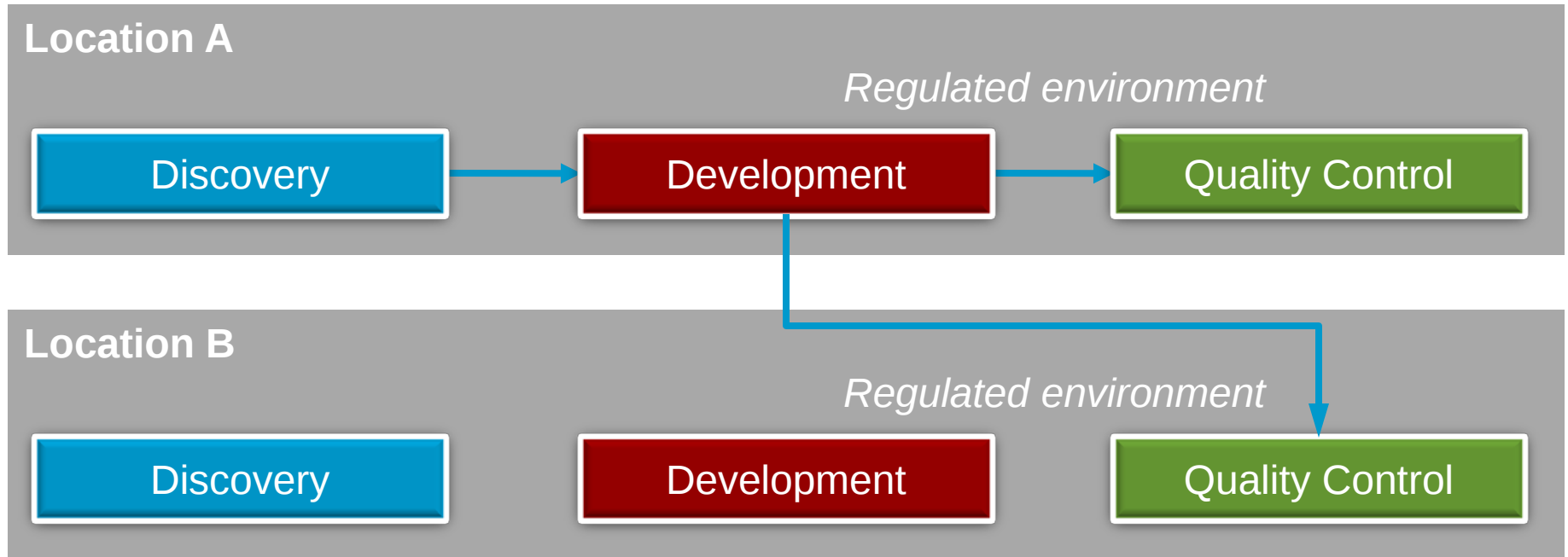


Agenda

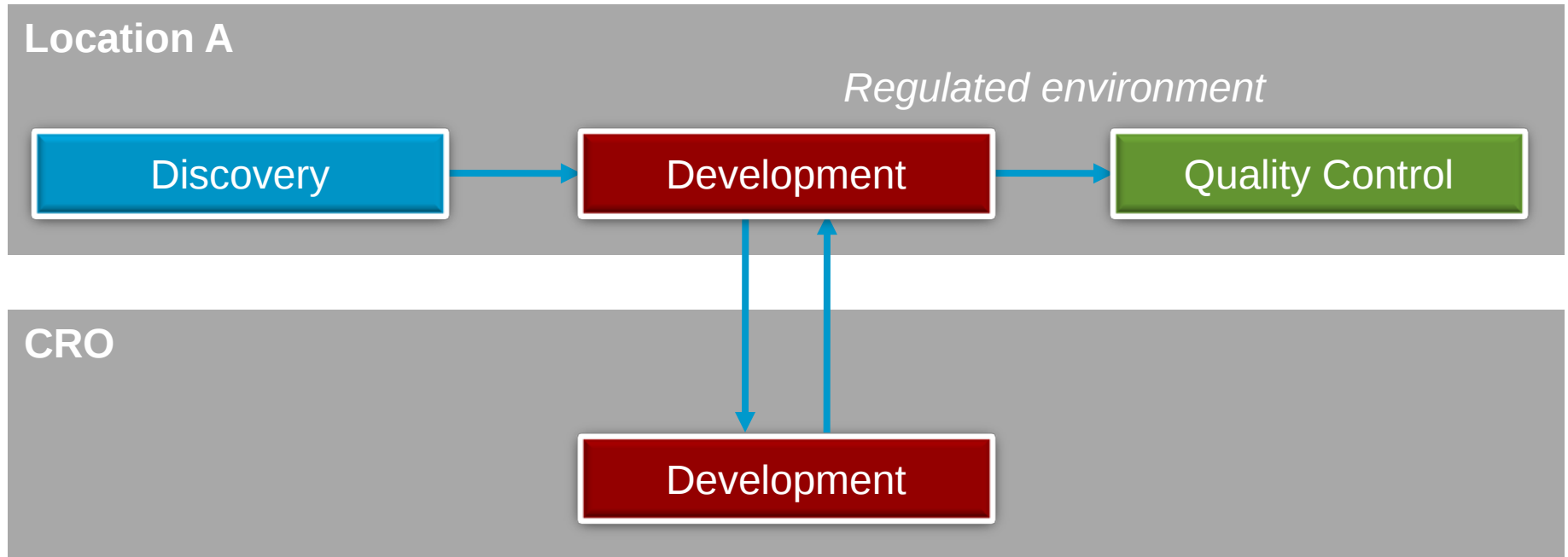
- Method transfer workflows
- Parameter affecting instrument to instrument method transfer
- Current solutions
- What is ISET
- Performance examples
- Summary



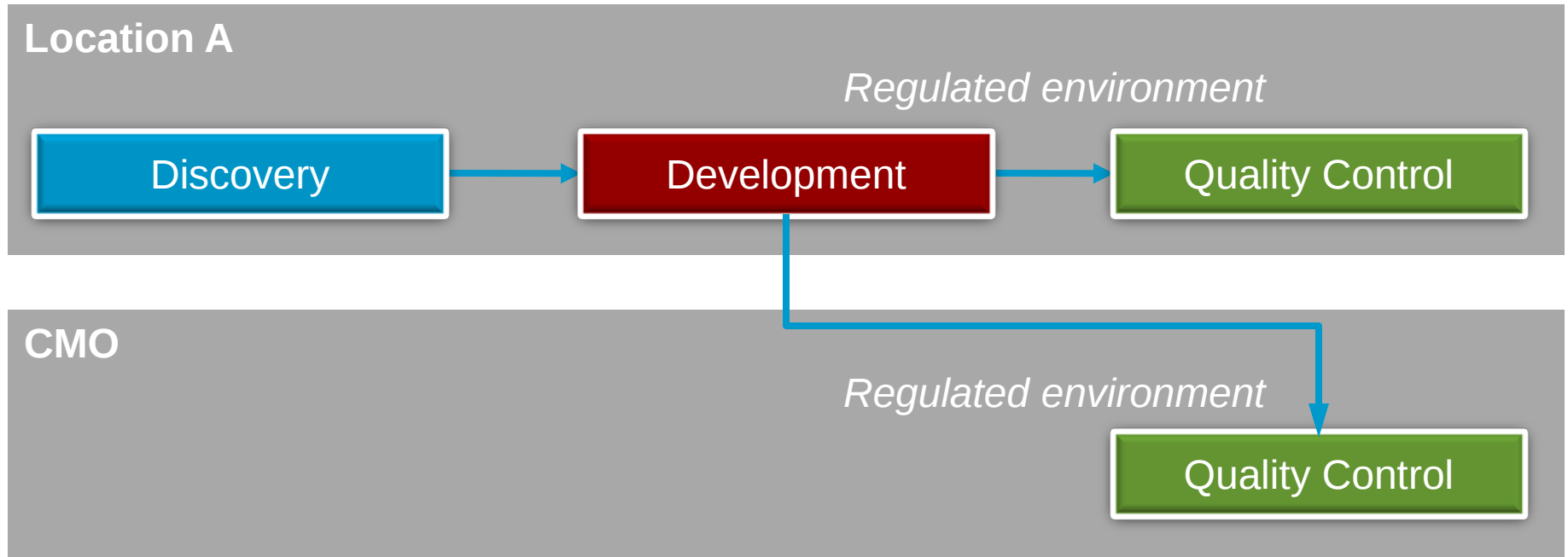
Method Transfer Workflow



Method Transfer Workflow



Method Transfer Workflow



Method Transfer Workflow



Instrumentation:
1100 Series, 1200 Series, Alliance,
Acquity, etc



Methods from Literature:
Scientific journals, application
notes, etc



Design Differences (U)HPLC Systems

- Delay volumes (gradient formation)
- Power range (flow x pressure)
- Extra column volume
- Temperature
- Data rates
- Sensitivity

Problem:

Instrument to Instrument Method Transferability

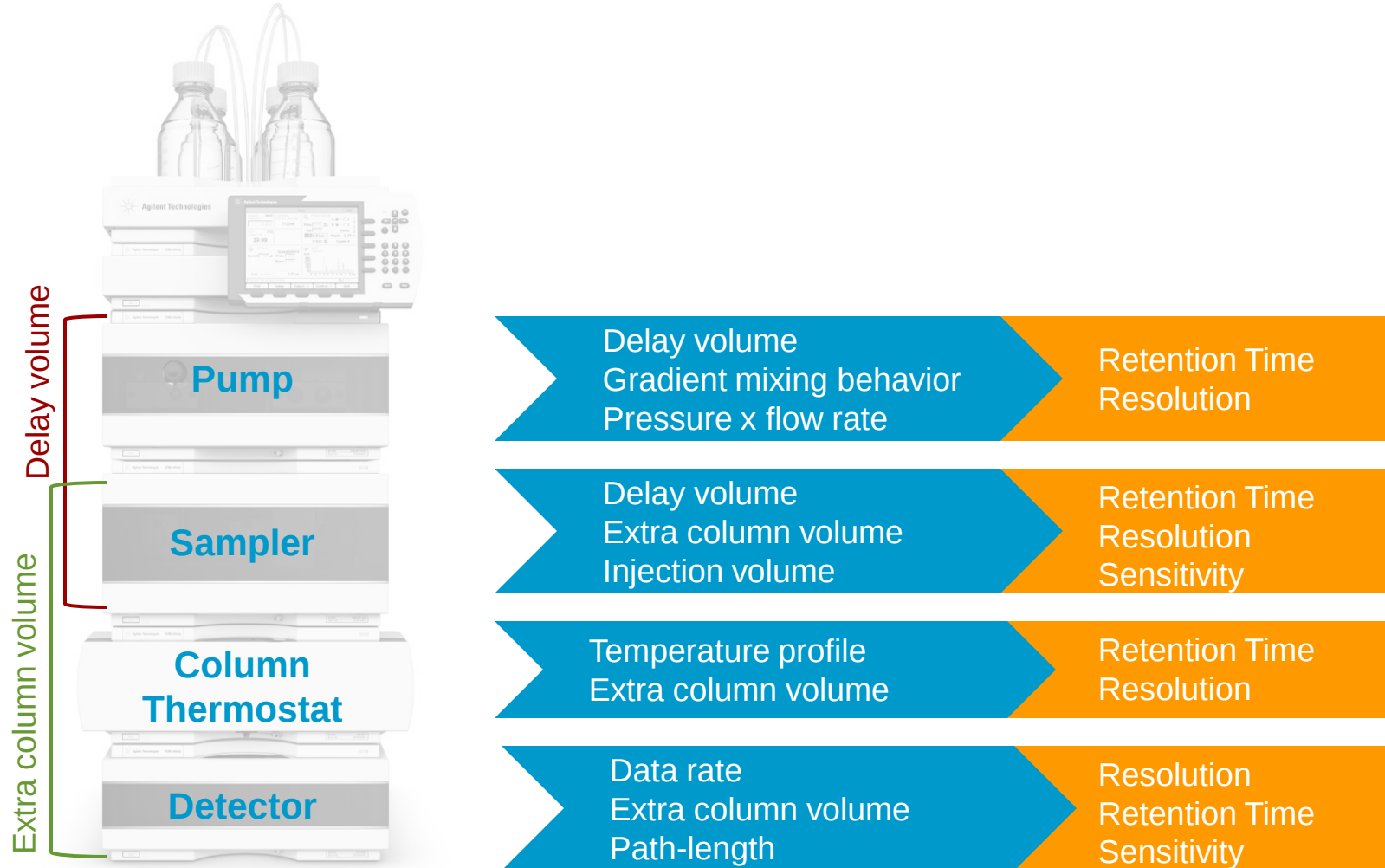
- Not possible
- Requires Re-development
- Requires Re-validation

Resulting in huge additional cost factor:



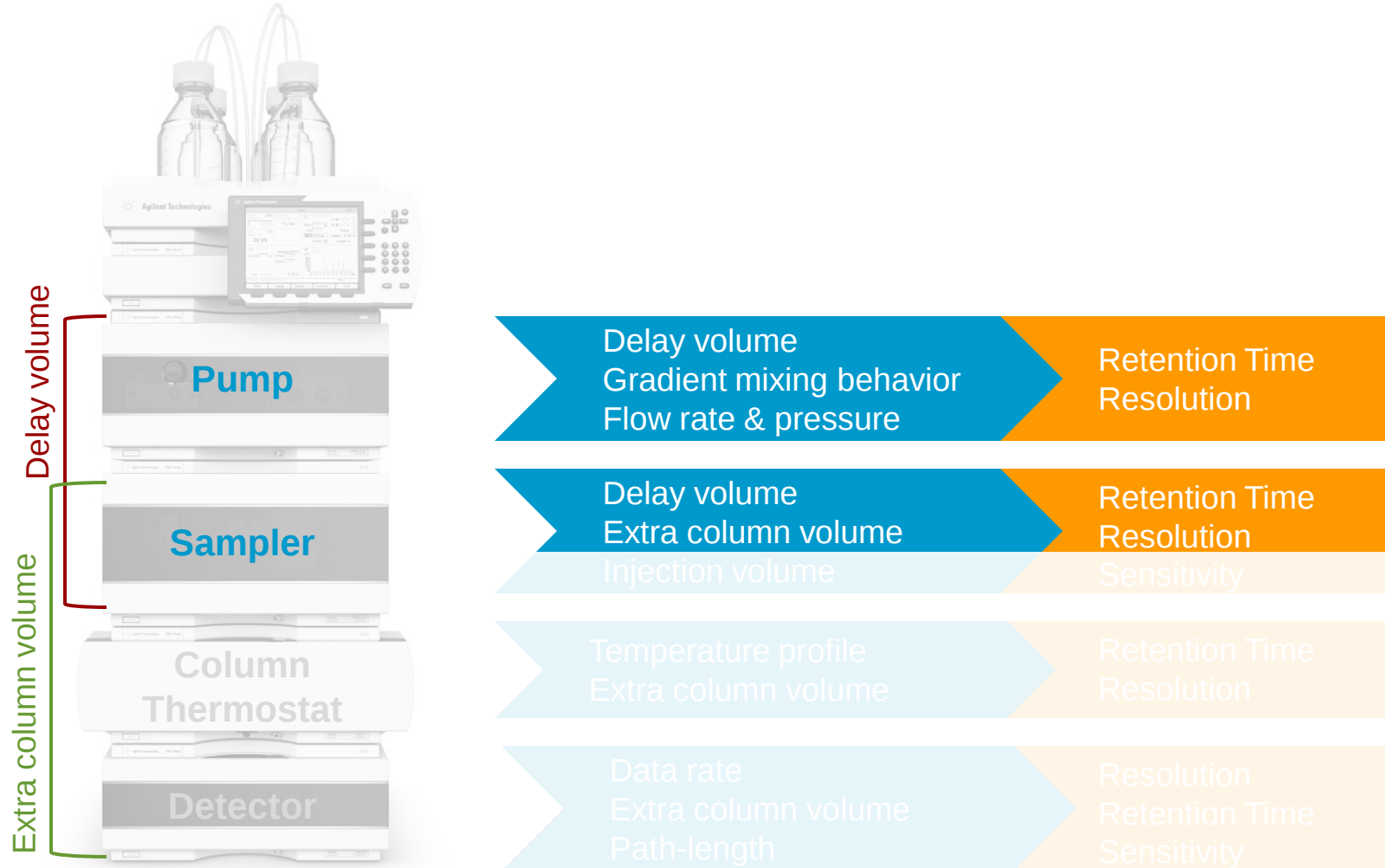
Instrument to Instrument Method Transferability

- Important Parameters



Instrument to Instrument Method Transferability

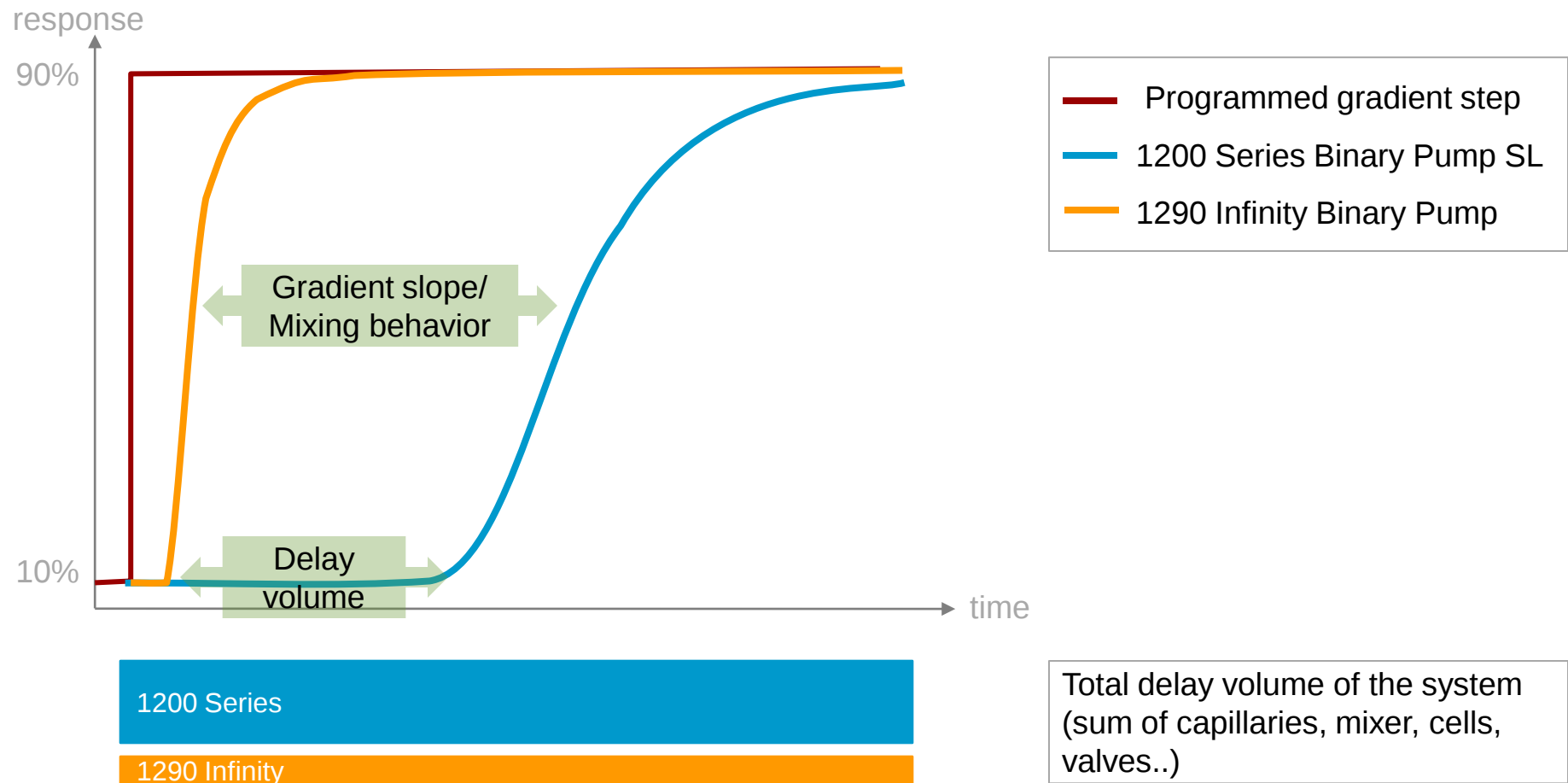
- Important Parameters



Instrument to Instrument Method Transferability

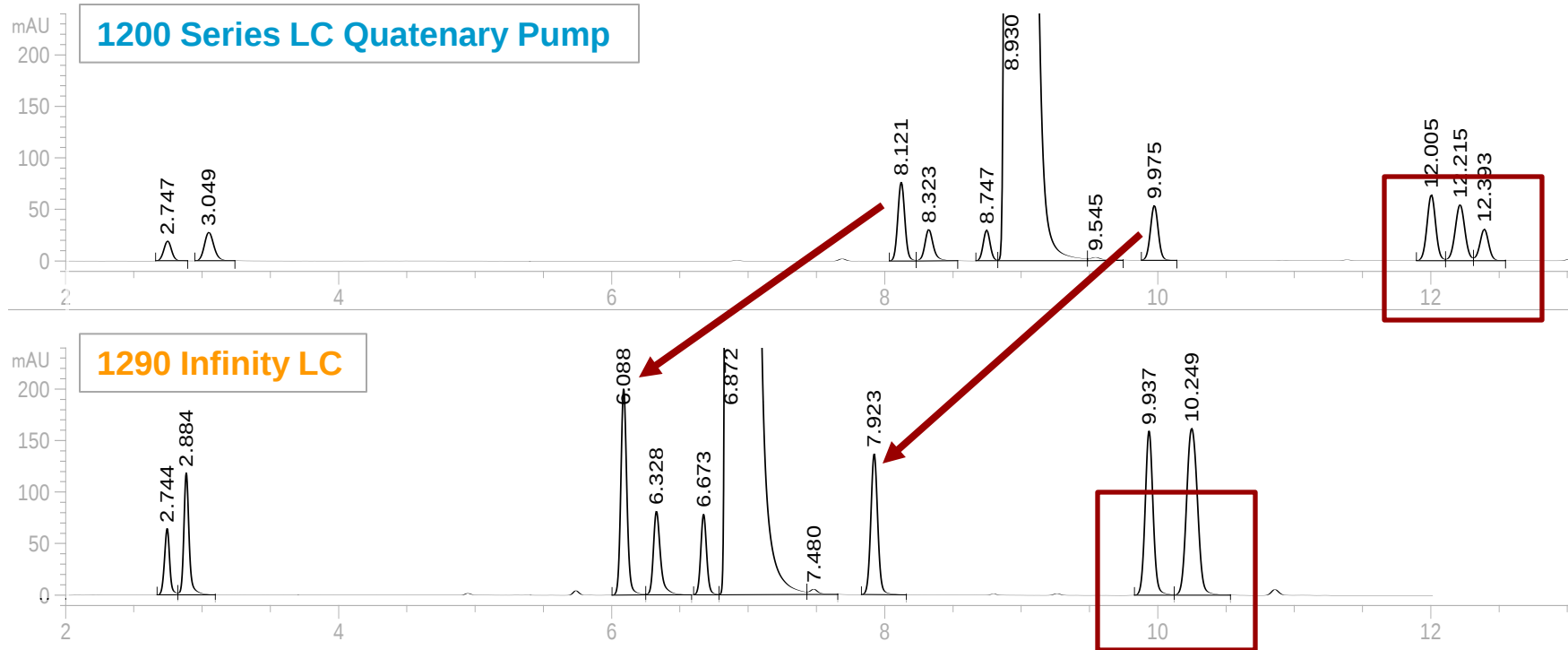
- Impact of delay volume and mixing behavior

What happens with a programmed gradient?



Gradient Analyses with Different LC Systems

- *Impact of delay volume and mixing behavior*



Sample: 0.5% impurities in formulation (metoclopramide)
 Xbridge C18, 150x3 mm, 3.5 μ m dp,
 0.45 ml/min, Eluent: A = 0.25 % AmAc, B = ACN,
 Gradient: 0-15 min; 5-57 % B

The result:

- Difference in RT and Resolution
- One peak is missing!



Instrument to Instrument Method Transferability

- *What can you do today?*

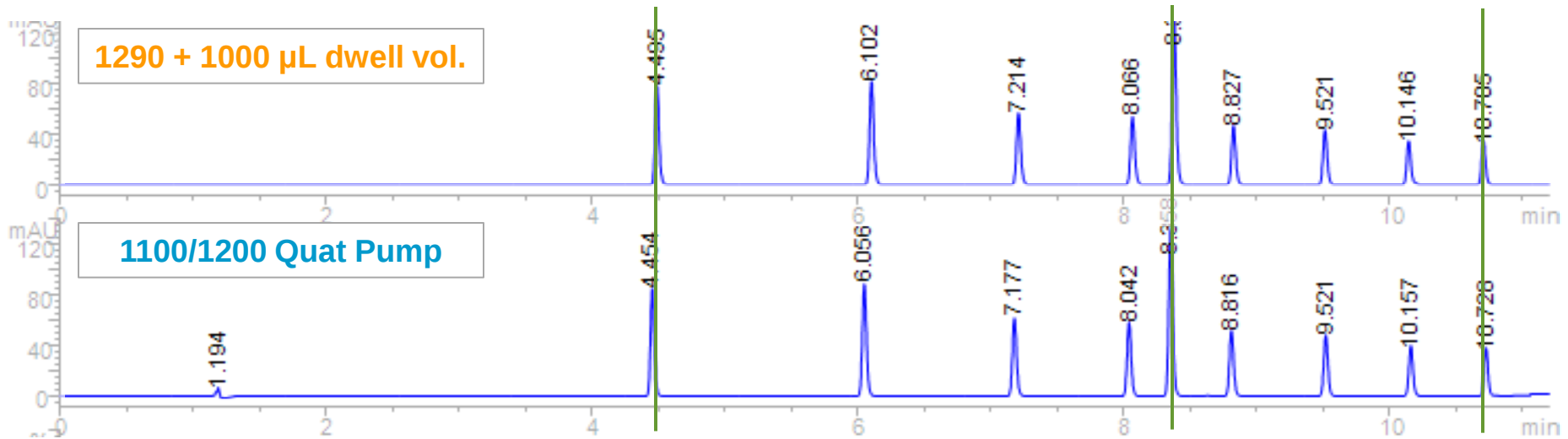
- From a *lower to higher* dwell volume LC system
 - A) Adding physical volume (plumbing solution)
 - B) Modifying your gradient table with isocratic hold
- From a *higher to lower* dwell volume LC system
 - C) Delay the injection (see appendix)



Method Transfer Possibilities Today

- A) Adding physical volume (plumbing solution)

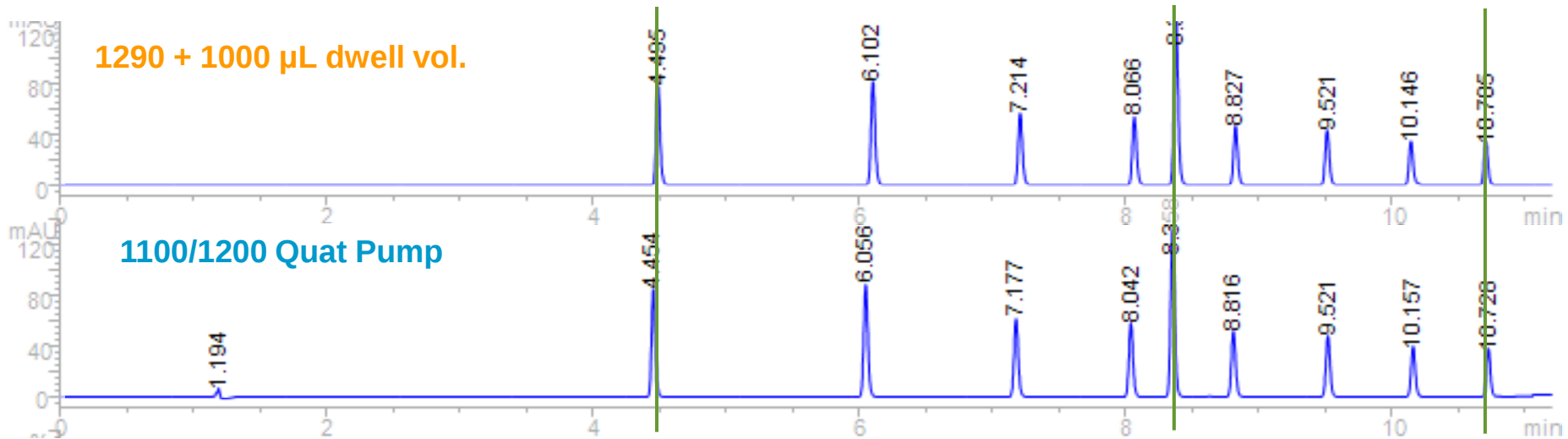
Example: 1290 Infinity LC



Method Transfer Possibilities Today

- A) Adding physical volume (plumbing solution)

Example: 1290 Infinity LC



Advantages

- Works well for not so fast analysis
- No Method change

Disadvantages

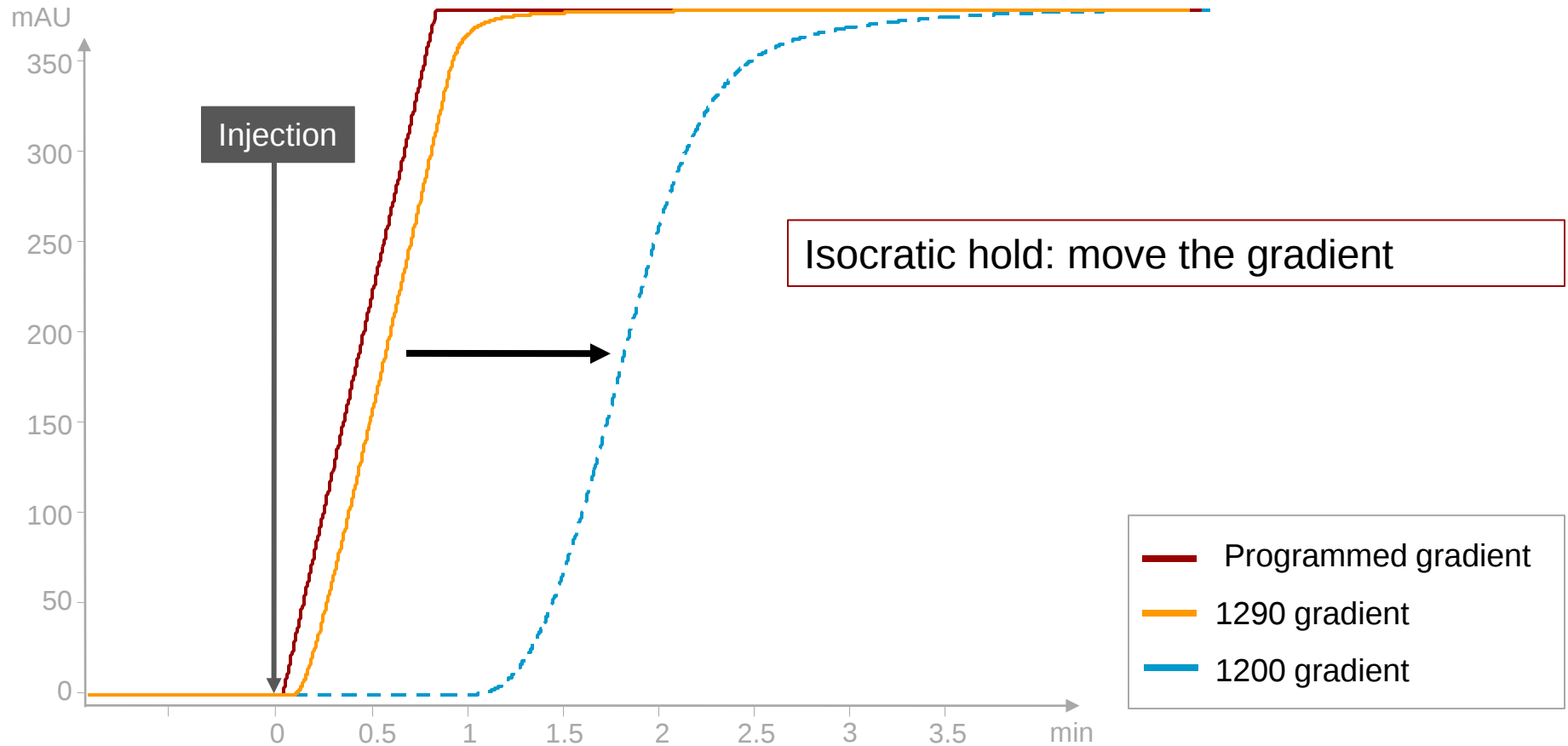
- Requires hardware change, no flexibility
- Requires manual determination of the dwell volume (Pumps with damper the dwell volume is not constant and depends on pressure)
- Hardware change difficult in validated environment



Method Transfer Possibilities Today

- *B) Isocratic Hold*

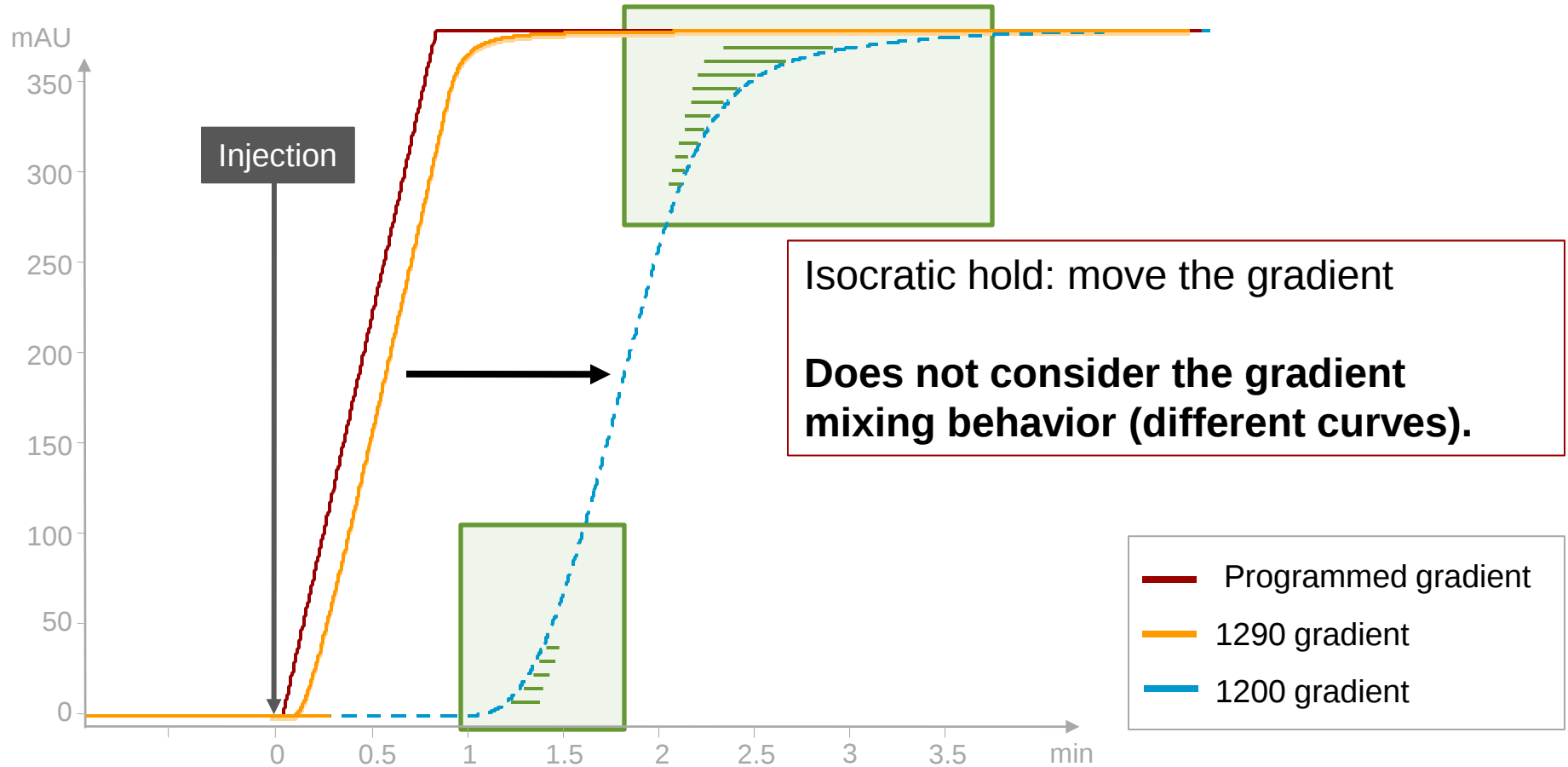
Example: 1290 to 1200



Method Transfer Possibilities Today

- B) Isocratic Hold

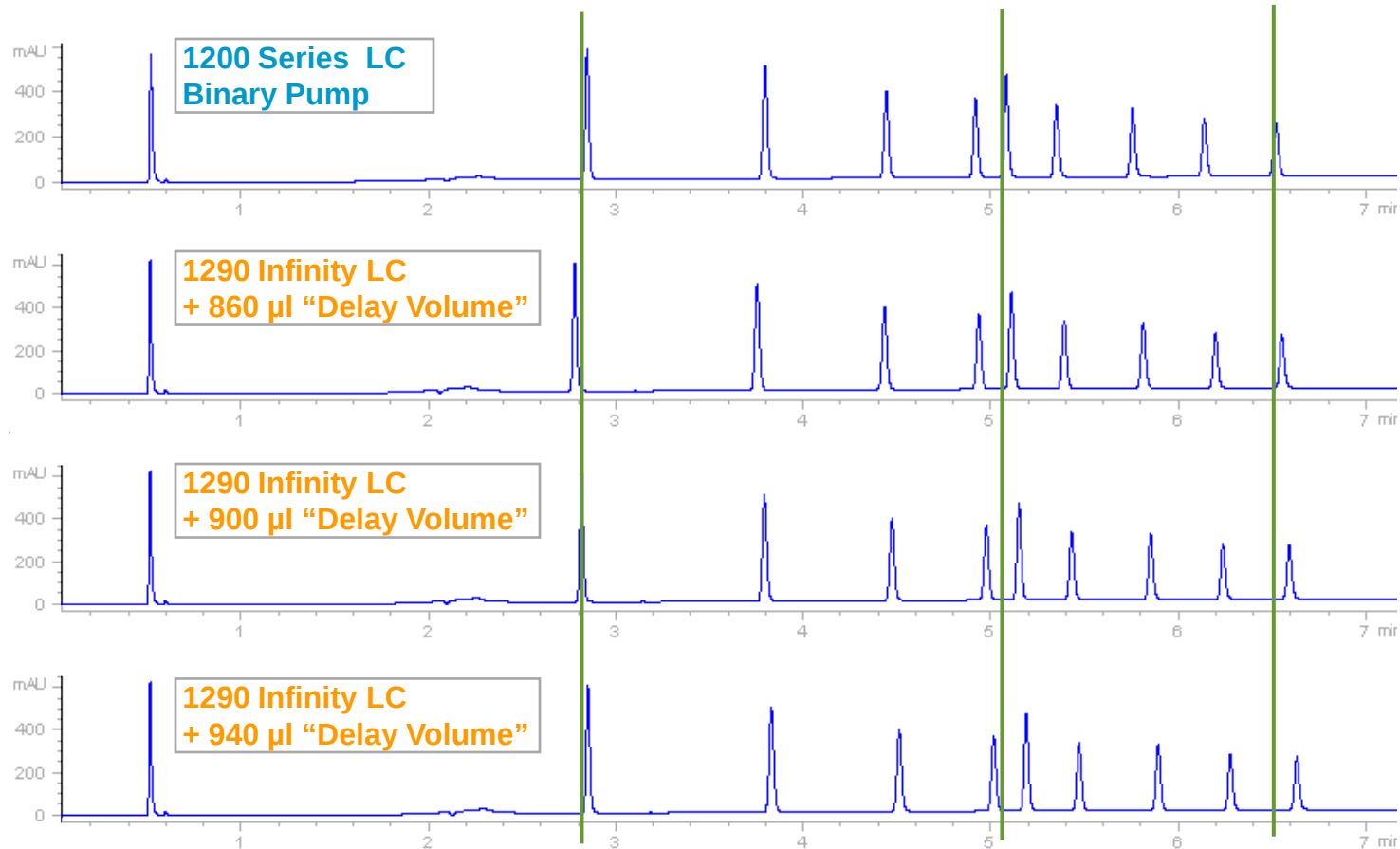
Example: 1290 to 1200



Method Transfer Possibilities Today

- *B) Isocratic Hold*

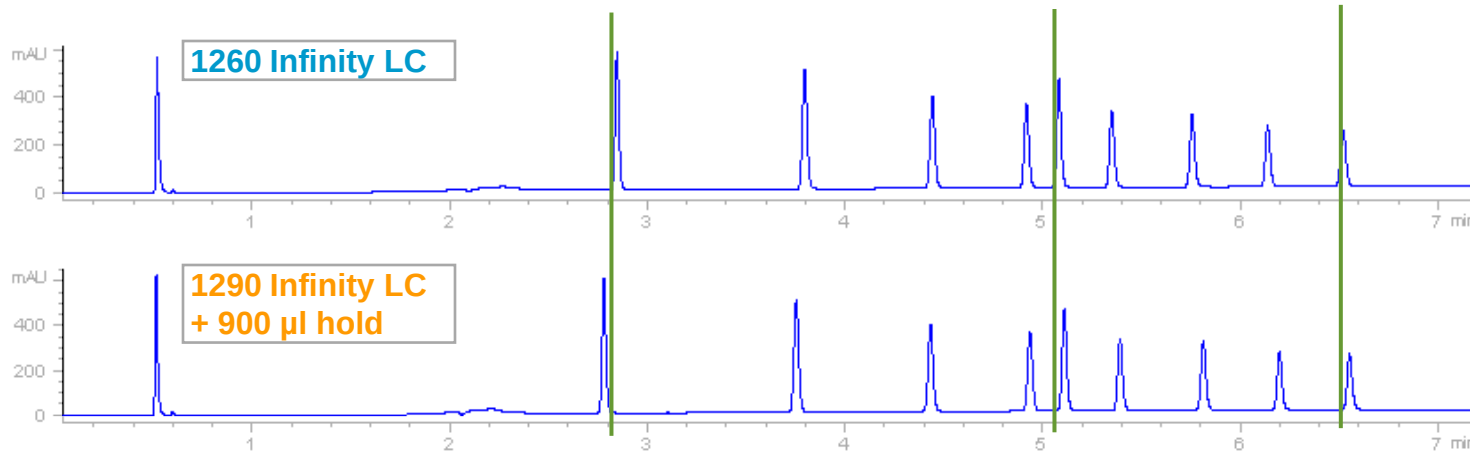
Example: 1290 to 1200



Method Transfer Possibilities Today

- B) Isocratic Hold

Example: 1290 to 1200



Advantages

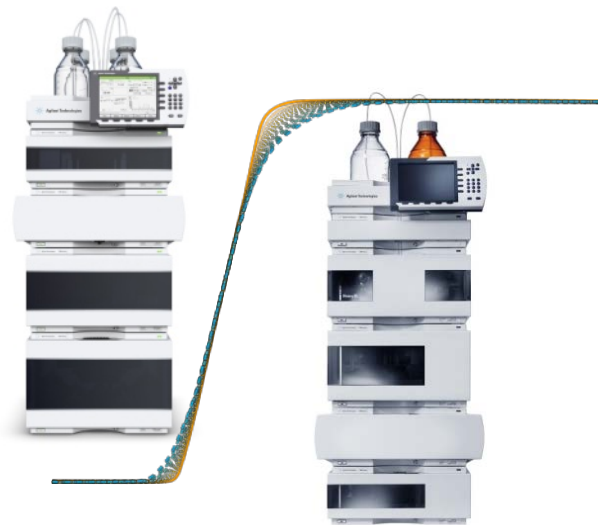
- Flexible, *Isocratic Hold* is part of the method

Disadvantages

- Works not in all cases
- Requires manual determination of the dwell volume/ isocratic hold (Pumps with damper the dwell volume is not constant and depends on pressure)
- Requires modification of the methods (should be avoided in validated environment, but doesn't require revalidation USP Chapter <621>)

NEW

Intelligent System The Solution Emulation Technology (ISET)

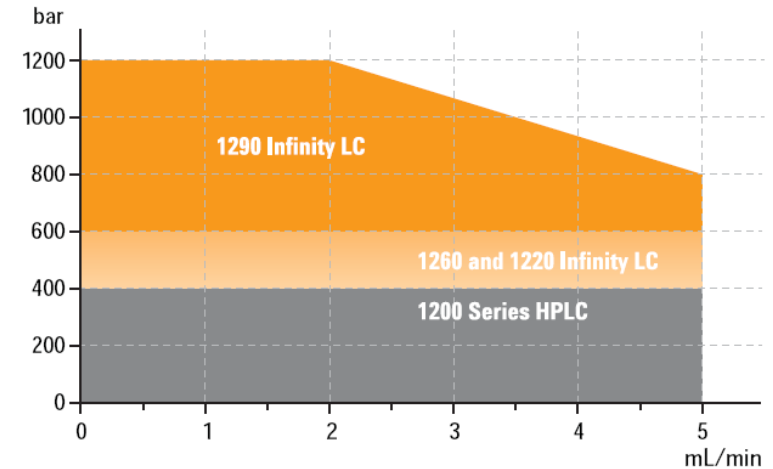


What is ISET?

- Two components

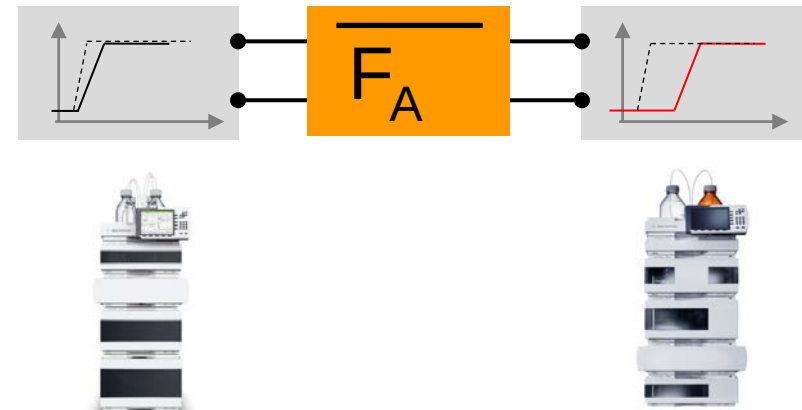
A. Best in class performance of the 1290 Infinity LC

Broad power range, ultra-low delay volume, superior sensitivity, unmatched flow and composition accuracy



B. The revolutionary ISET emulation algorithm

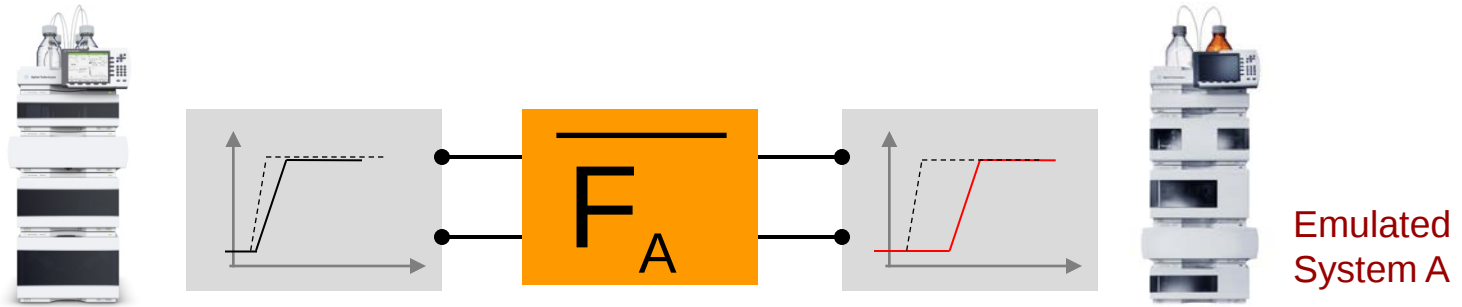
Full characterization of target LC systems
Creation of emulation function



Method Transferability: 1290 Infinity LC

- System Emulation Technology

Concept



Select System to be emulated by a simple mouse click:



Agilent
1100 Series



Agilent 1200
Series LC



Agilent 1260
Infinity LC



Agilent 1220
Infinity LC

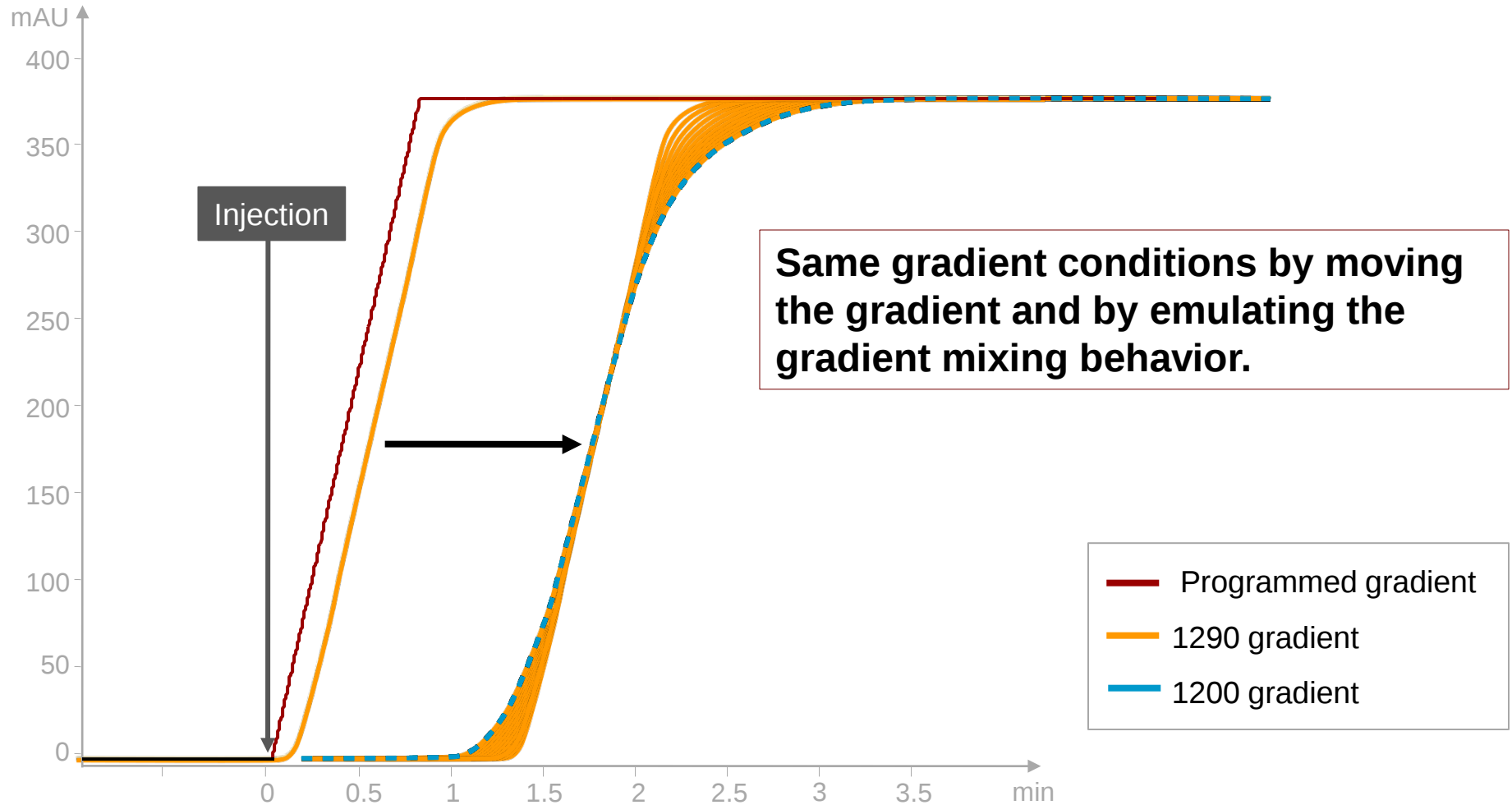


Other



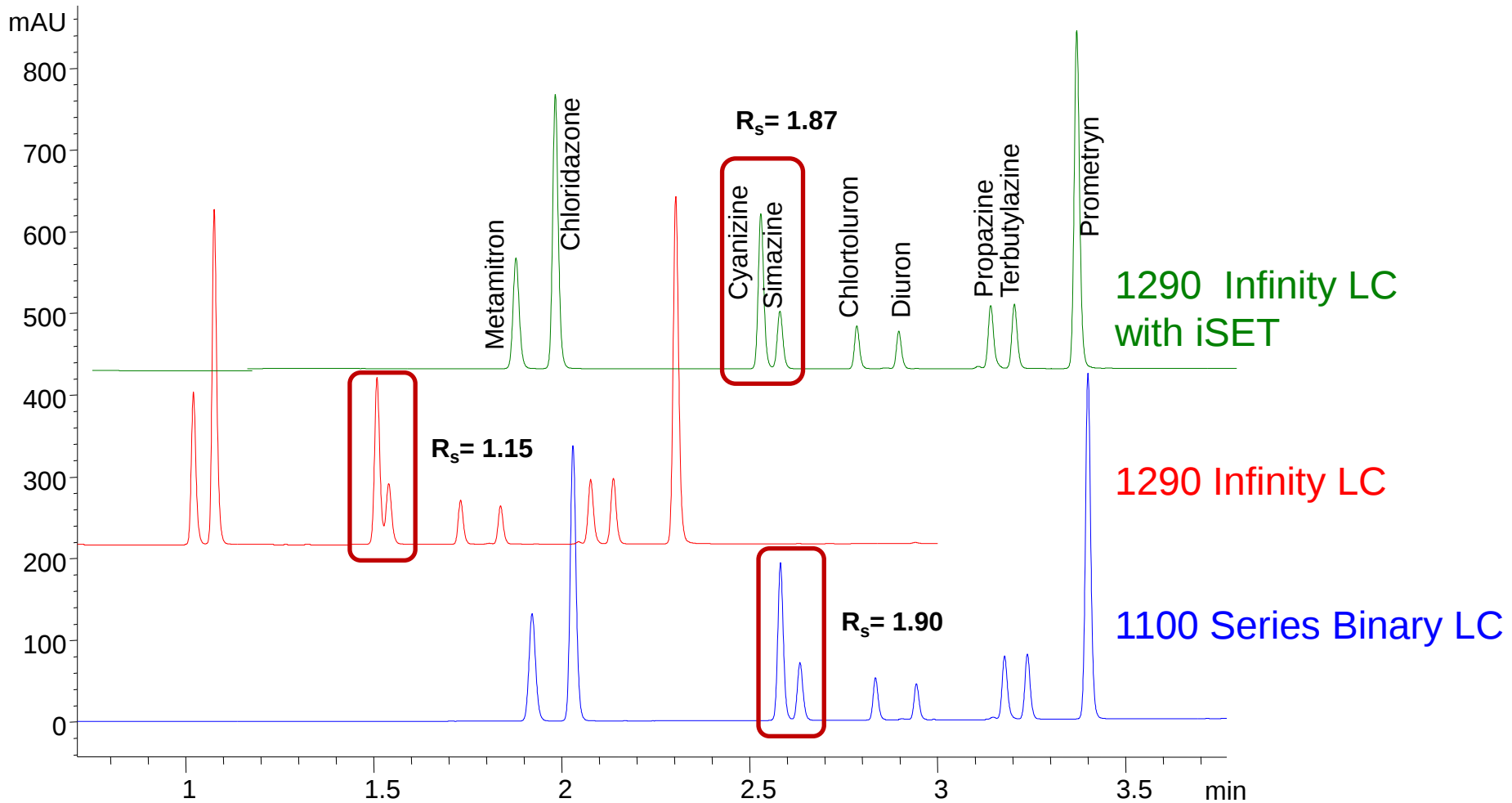
Intelligent System emulation technology

- *How it works (1290 to 1200)*



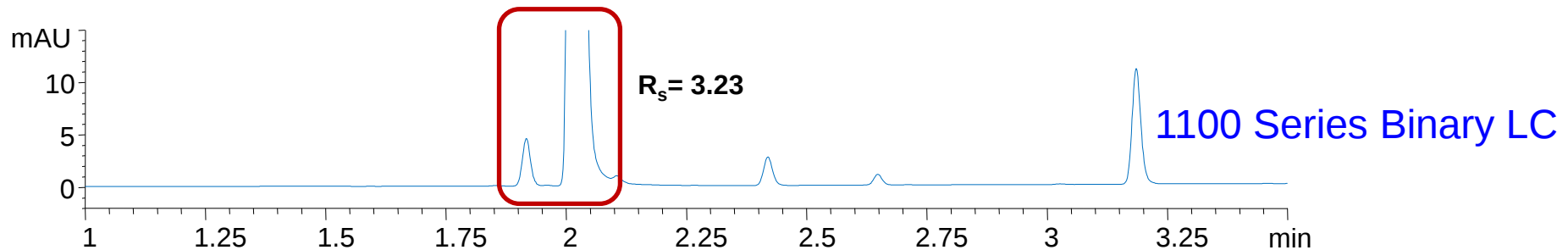
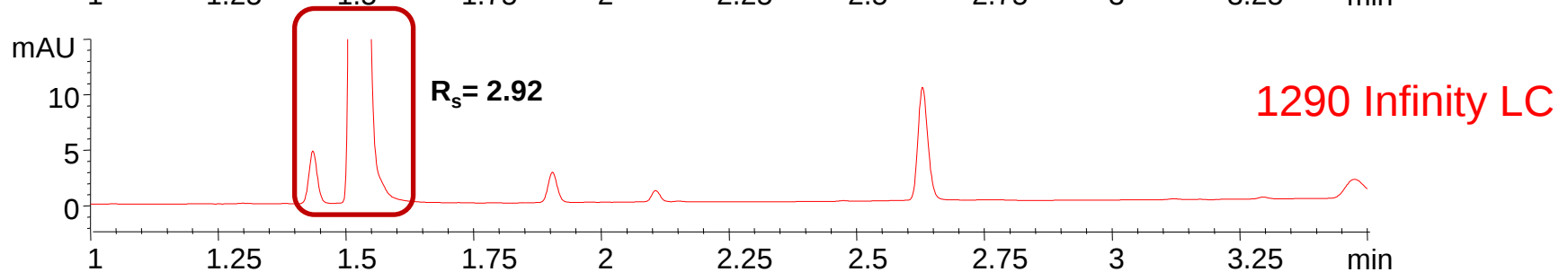
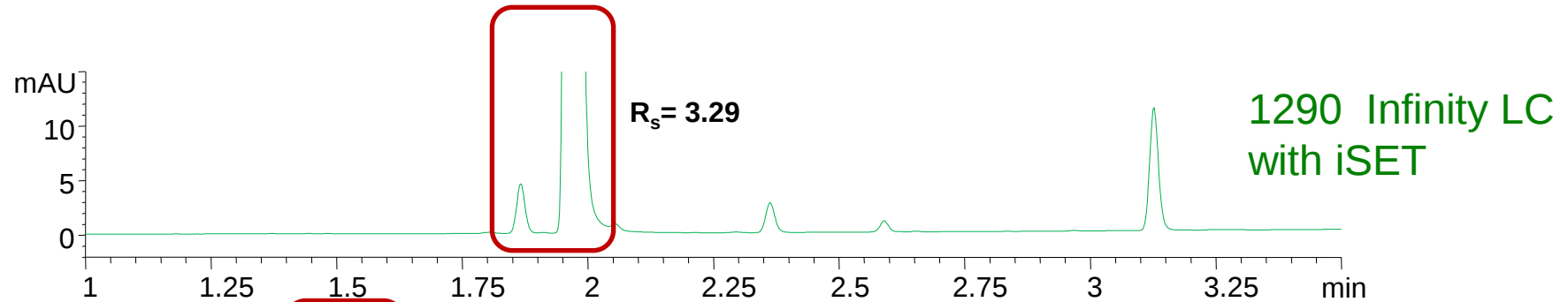
Pesticides

Column: 3 x 50 mm, 2.7 μm Poroshell



Impurities analysis

Column: 4.6 x 50 mm, 1.8 μm



LC Method Transfer Possibilities *Tomorrow*

- *LC System Emulation Technology*

Advantages

- Simple and flexible
(select the emulated LC system simply by a mouse click)
- No determination of the dwell volume etc. required
(perfectly covers pumps with damper and not constant dwell volume)
- Works perfectly in all cases
- Requires no modification of the methods
(no conflicts in regulated environment)



Intelligent System Emulation Technology ISET

- *Benefits*

➤ **Accelerate your method transfer**

No more method transfer problems! Simply emulate the LC system on which the original method was developed –with a single mouse click.

➤ **Make a safe investment**

Run your legacy methods with ISET and at the same time take full advantage of the UHPLC speed, resolution and sensitivity of the 1290 Infinity LC .

➤ **Achieve higher productivity**

Speed up your method development with UHPLC performance and then fine-tune your method by emulating the target system – and be confident that the method will run as intended.



Agilent 1290 Infinity LC with ISET inside

- *The Art of Emulation*

- **Emulates other (U)HPLC instruments**
 - *by a simple mouse click*
- **Runs existing (U)HPLC methods**
 - *without modifying method or system*
- **Delivers same retention times and peak resolution**
 - *for infinitely better method transfer*

