Getting More Done with Less Effort:

Usability Advances in a New Chromatography Data System

Jim Schibler
Dionex Corporation, Sunnyvale, CA

DIONEX
Passion. Power. Productivity.

Getting More Done with Less Effort

- The Productivity Challenge
  - What productivity means
  - Key ways to improve productivity in the modern laboratory
- A New Chromatography Data System Designed for Usability
  - User interface and navigation
  - Data review and analysis
  - Workflow management
- Closing Remarks

ISO Slide Number

What is Productivity?

Cost per analysis?

Sample turnaround time?

% instrument utilization?

Some other measure?

Analyses per labor-hour?

Analyses per week?

Average time per analysis?

What is Productivity?

Output Produced per Resources Consumed

- Quantity
- Quality
- Capital equipment
- Consumables
- Utilities
- Labor
- Time

Key Ways to Improve Laboratory Productivity

- Improve analytical methodology (including sample preparation)
- Increase utilization rate of resources
- Automate to a higher degree
- Improve operator efficiency

Best opportunities!

ISO Slide Number

Better software can improve automation and operator efficiency

Software Usability Issues that Limit Operator Efficiency

- Unclear paths to goals
- Distractions caused by too many options at inappropriate times
- Confusion from poorly chosen or inconsistent logic and terminology
- Unnecessary extra steps in processes
- Unexpected responses of software to user actions
- Failure to trap or prevent operator errors

ISO Slide Number

All these issues waste time and create frustration

A New Chromatography Data System Designed for Usability

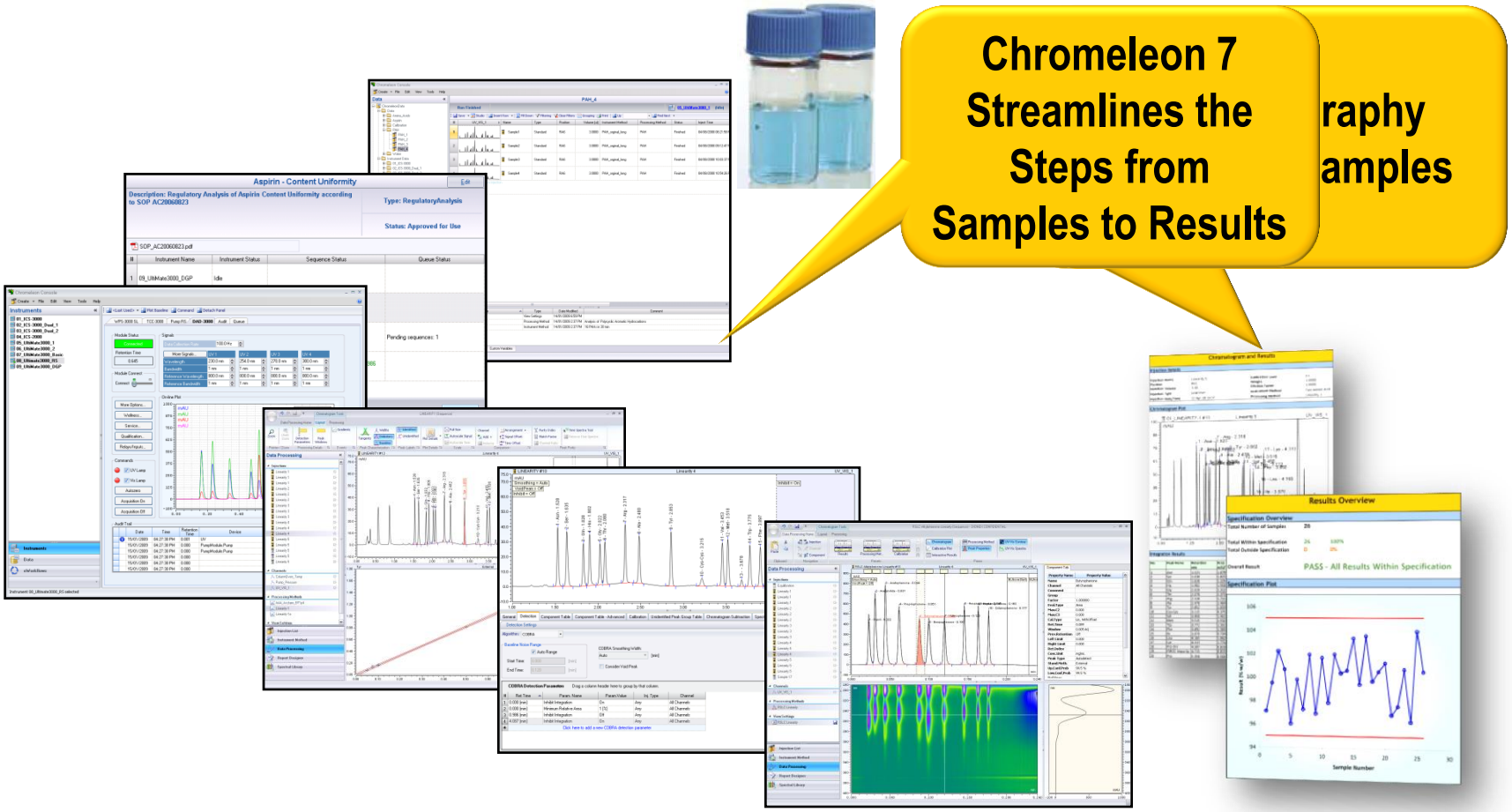
Intelligent Functionality + Operational Simplicity

DIONEX
Passion. Power. Productivity.

Chromeleon 7

- Next-generation Chromatography Data System
- "**Simply Intelligent**":
  - Intelligent functionality — everything you need to generate results!
  - Operational Simplicity™ — everything is fast and easy!
- Simplifies all chromatography processes

Chromatography Process



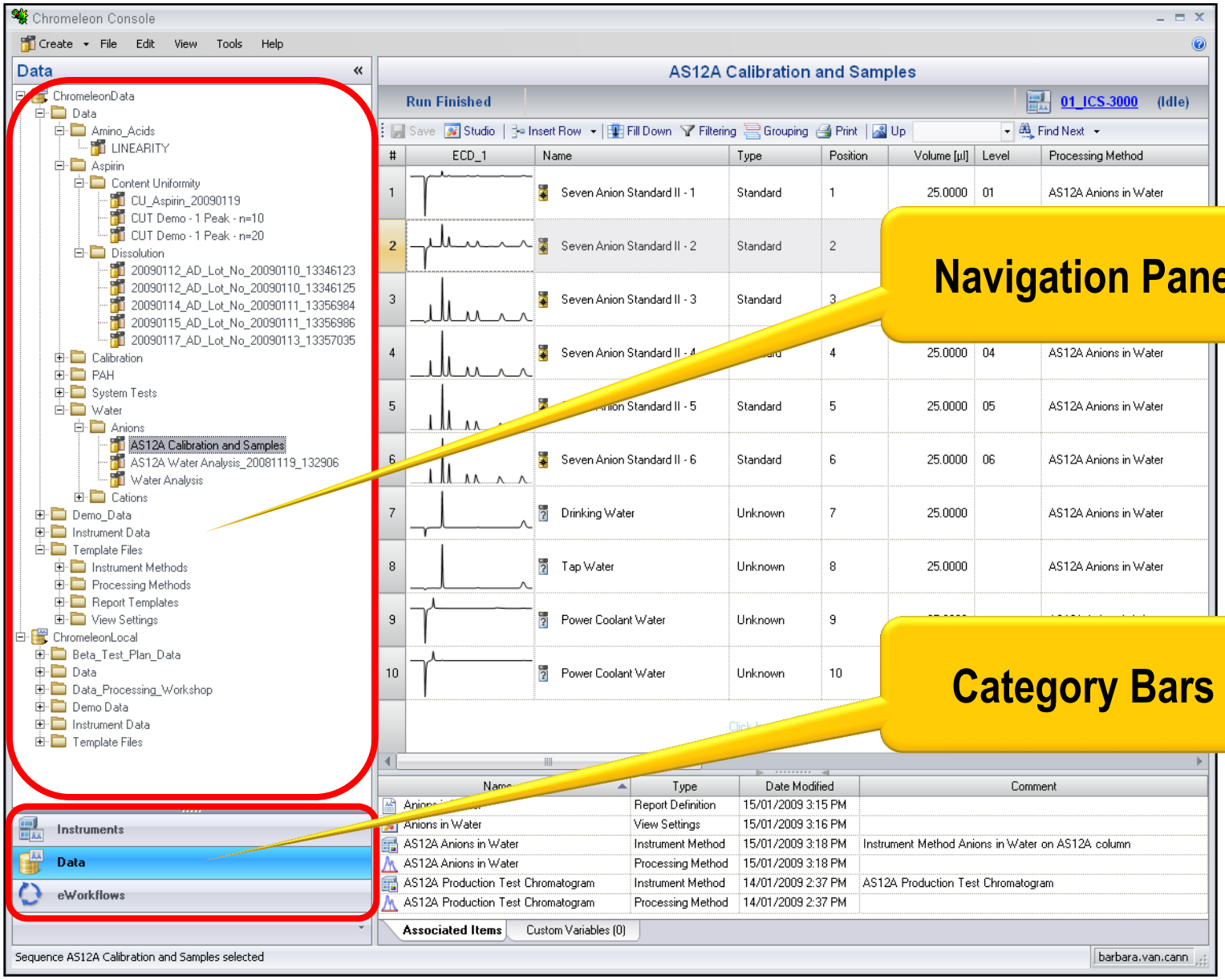
DIONEX
Passion. Power. Productivity.

Chromeleon 7—Operational Simplicity

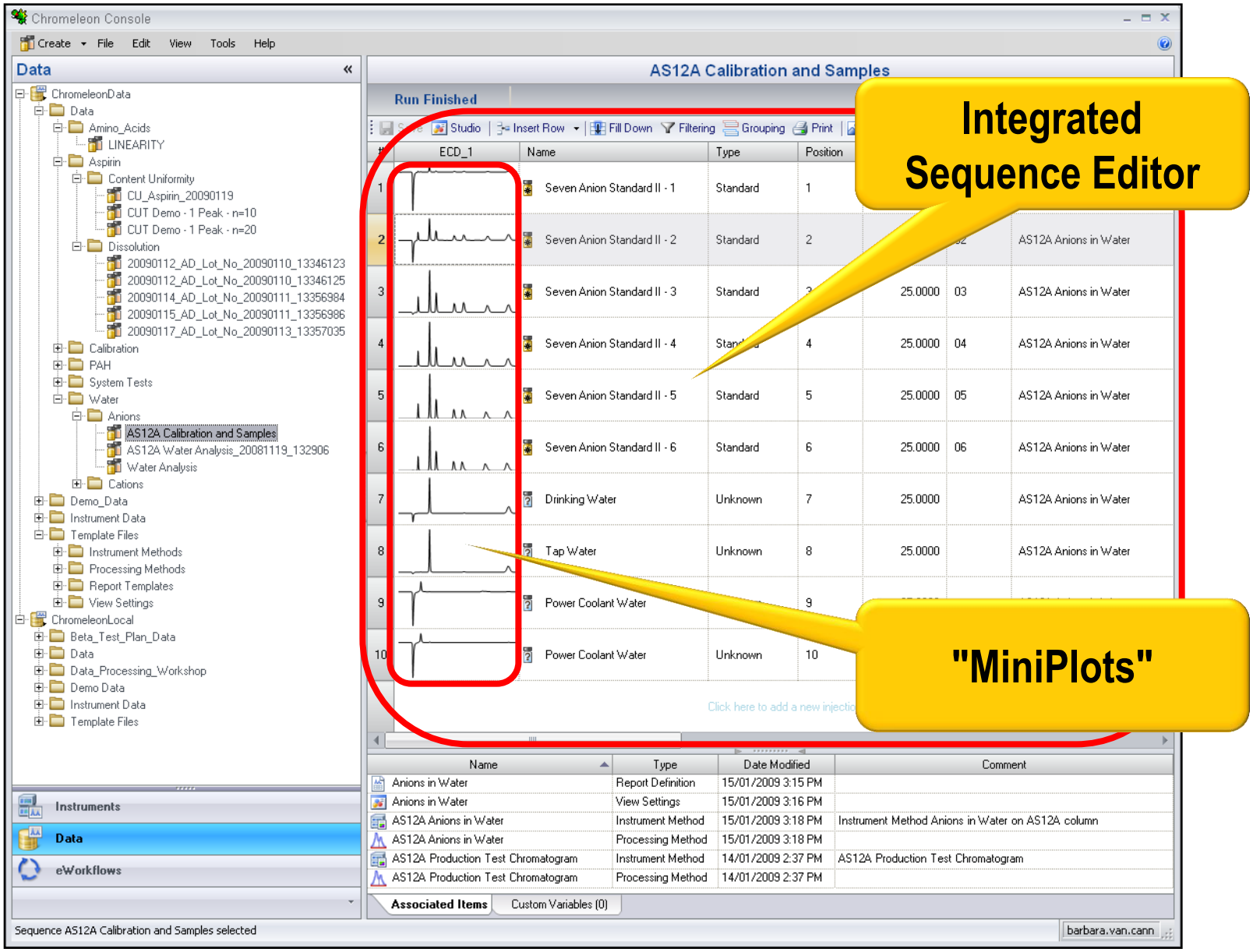
- Operational Simplicity™ was the core design principle
- Major design goals:
  - Minimize number of steps needed to perform any task
  - Make all steps easy to understand and easy to use
  - Minimize time needed to perform any task
- Three major features for **Operational Simplicity**:
  - Modern user interface
  - Peak detection and integration tools
  - eWorkflows

Chromeleon 7:
User Interface

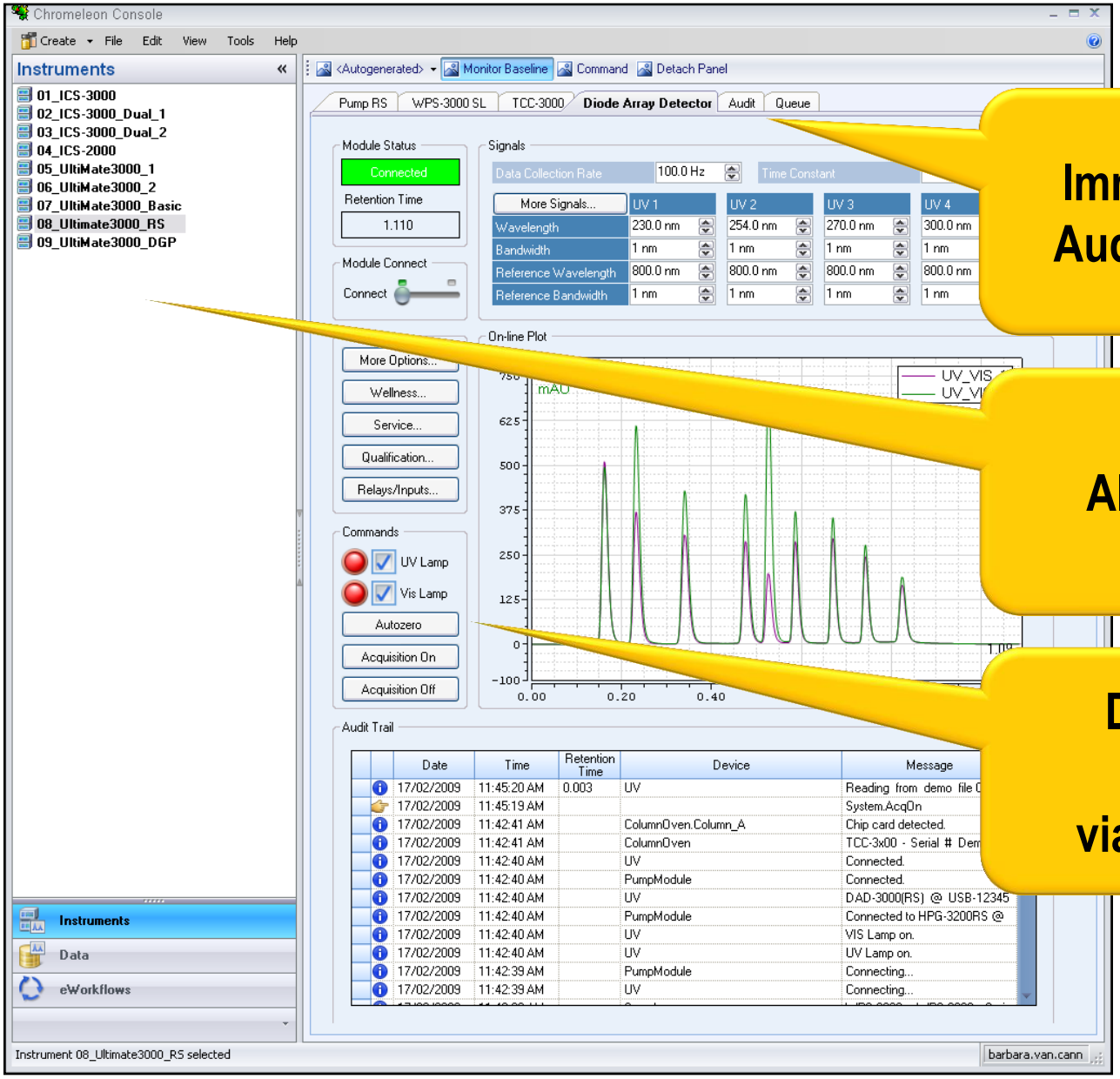
Console: Quick Access to Instruments, Data, eWorkflows



Console: Quick Access to Instruments, Data, eWorkflows



Console: Access to Instruments via ePanels

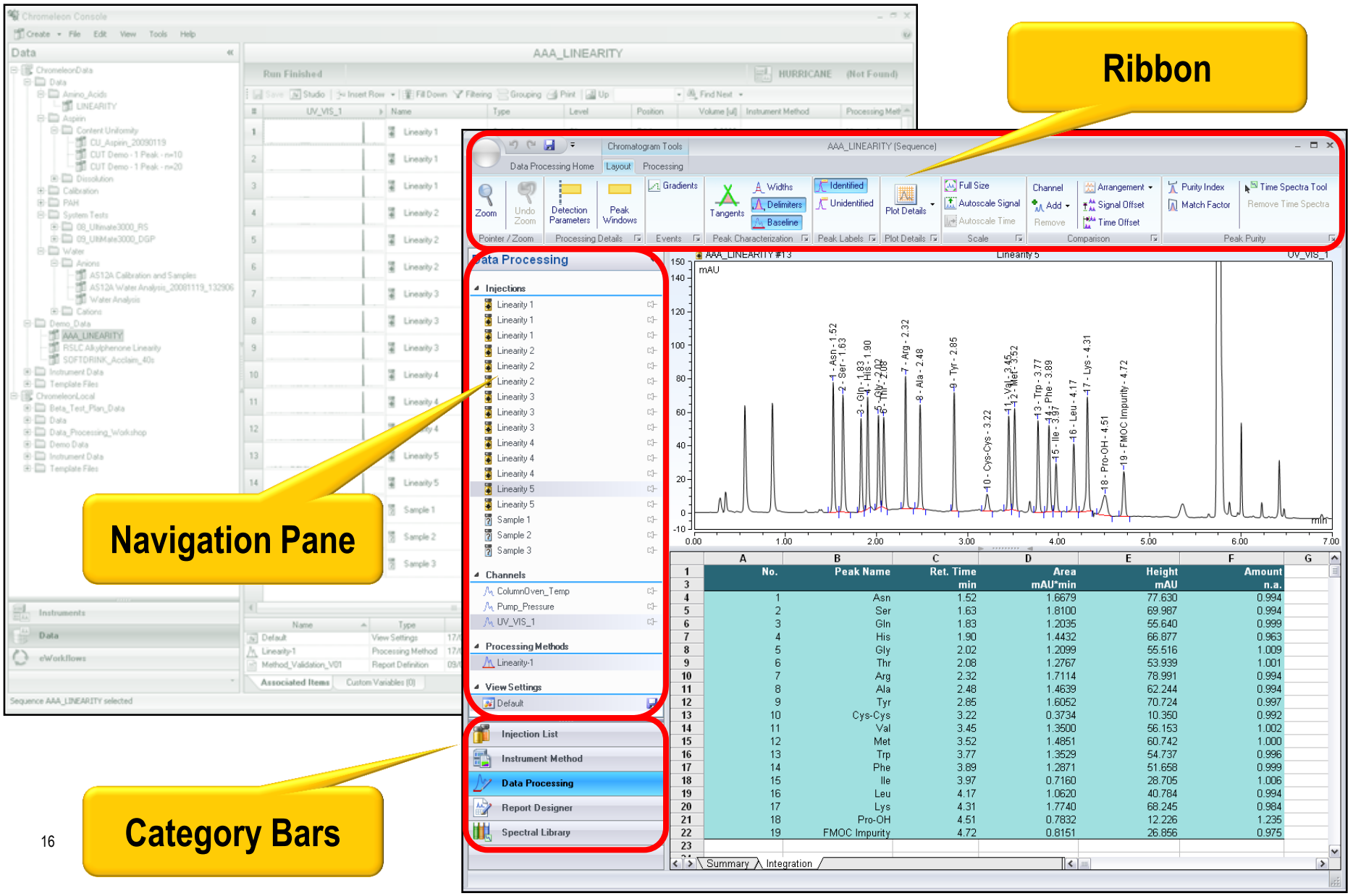


Immediate Access to Audit Trail and Queue

Easy Access to All Instruments on the Network

Direct Control of Instrument via ePanel Controls

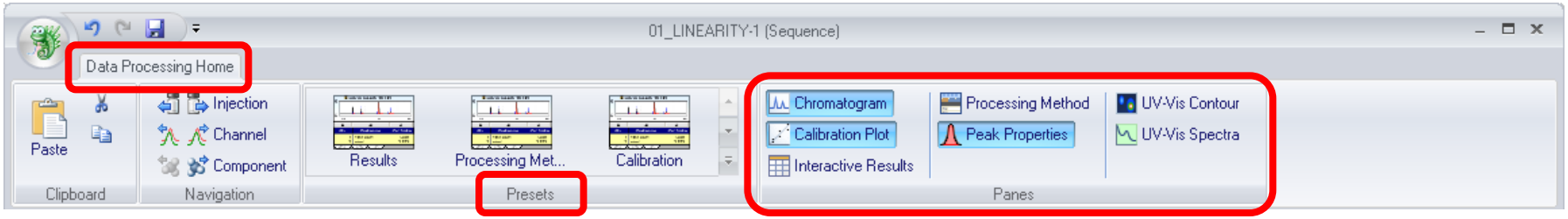
Chromatography Studio: All Details of an Experiment



No.	Peak Name	Ret. Time min	Area mAU*min	Height mAU	Amount n.a.
1	Asn	1.52	1.6679	77.630	0.994
2	Ser	1.63	1.8100	69.987	0.994
3	Gln	1.83	1.2035	55.640	0.999
4	His	1.90	1.4432	66.877	0.963
5	Gly	2.02	1.2099	55.516	1.009
6	Thr	2.08	1.2767	53.939	1.001
7	Arg	2.32	1.7114	78.991	0.994
8	Ala	2.48	1.4639	62.244	0.994
9	Tyr	2.85	1.6052	70.724	0.997
10	Cys-Cys	3.22	0.3734	10.350	0.992
11	Val	3.45	1.3500	56.153	1.002
12	Met	3.52	1.4851	60.742	1.000
13	Trp	3.77	1.3529	54.737	0.996
14	Phe	3.89	1.2871	51.658	0.999
15	Ile	3.97	0.7160	28.705	1.006
16	Leu	4.17	1.0620	40.784	0.994
17	Lys	4.31	1.7740	68.245	0.984
18	Pro-OH	4.51	0.7832	12.226	1.235
19	FMOC Impurity	4.72	0.8151	26.856	0.975

New Ribbon Interface

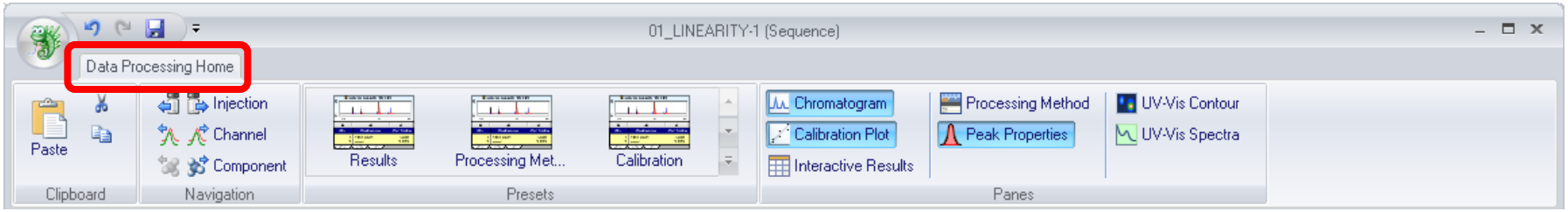
- Provides contextual access to commands and options in the Studio
  - General options via Home ribbon (always available):



Simple, consistent, and tidy system for accessing all options

New Ribbon Interface

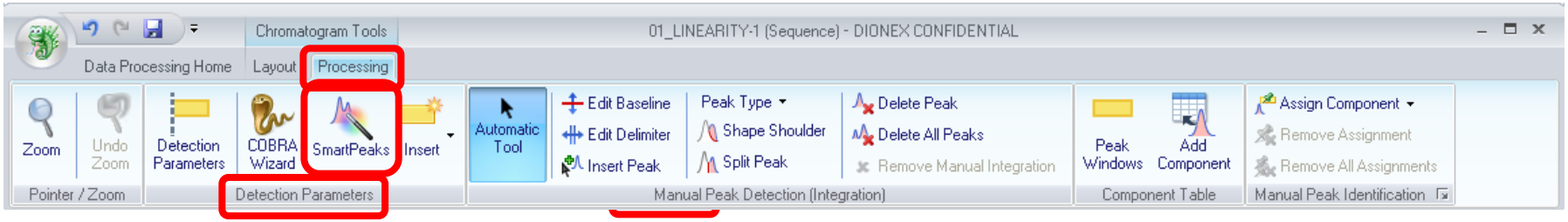
- Provides contextual access to commands and options in the Studio
  - Minimize the ribbon area by double-clicking any ribbon tab



Simple, consistent, and tidy system for accessing all options

New Ribbon Interface

- Provides contextual access to commands and options in the Studio
  - Chromatogram options via Contextual Ribbons:

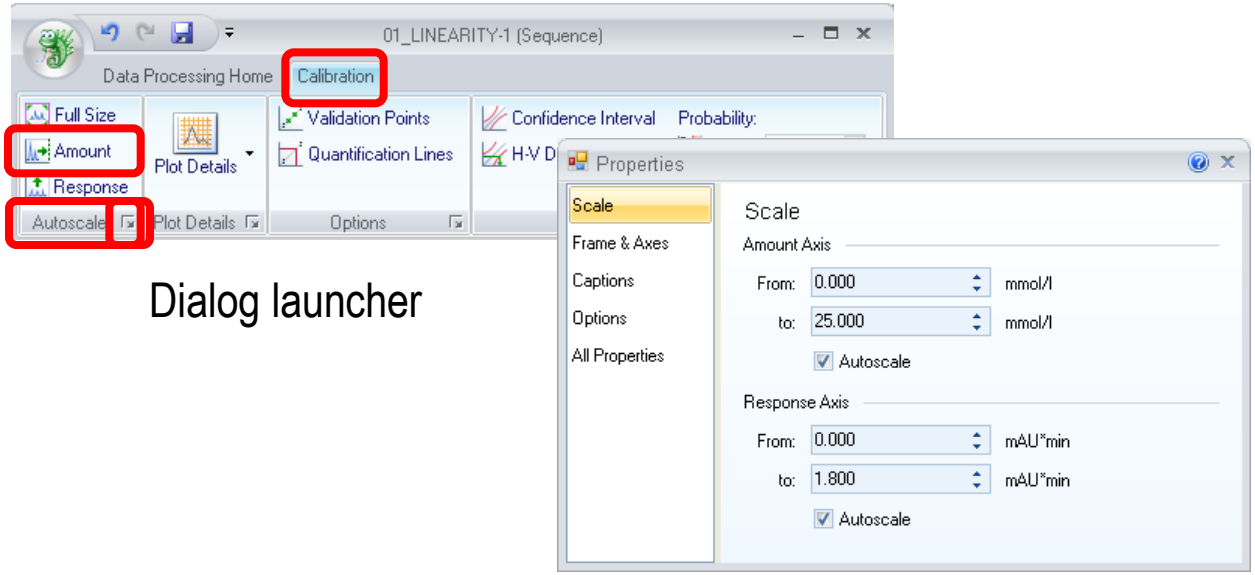


Simple, consistent, and tidy system for accessing all options

New Ribbon Interface

- Provides contextual access to commands and options in the Studio

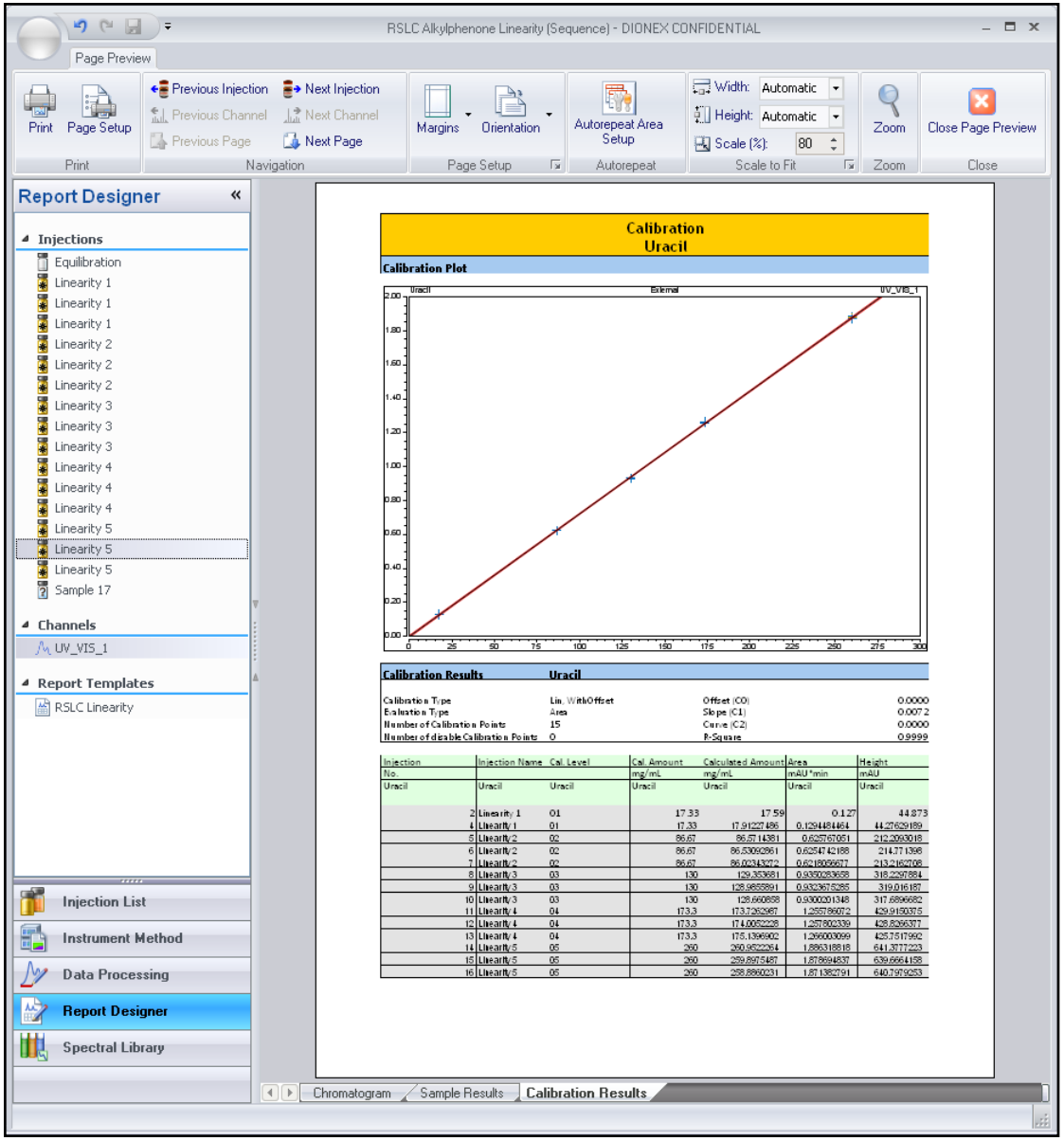
  - Calibration Plot options via Contextual Ribbon:



Dialog launcher

Simple, consistent, and tidy system for accessing all options

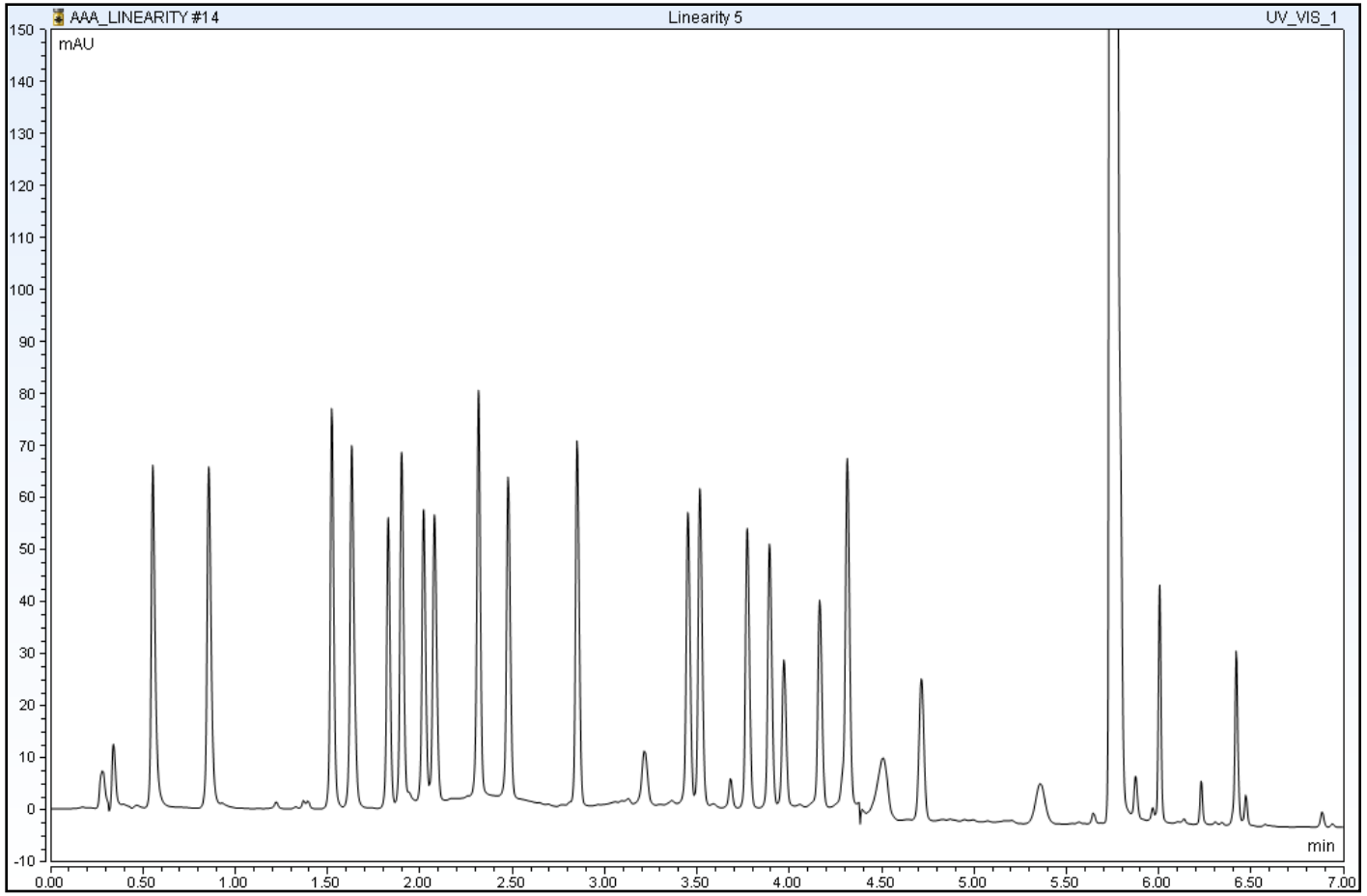
Chromatography Studio: Report Designer



- Fully customizable report templates
- Built-in spreadsheet capabilities

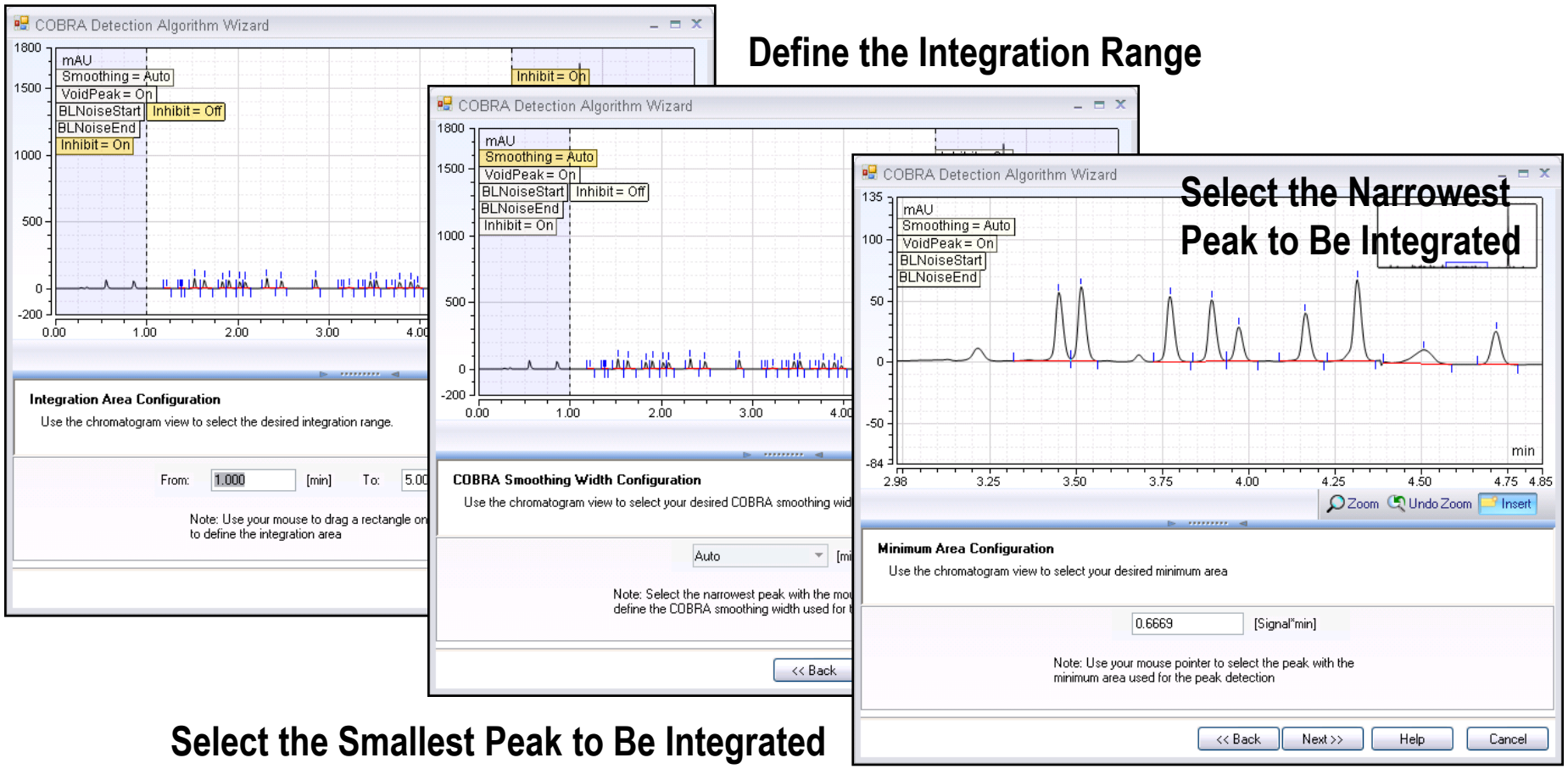
Chromeleon 7:
Peak Detection and Integration

Cobra™ Peak Detection Algorithm



Cobra™ Peak Detection Algorithm

Start Cobra Wizard

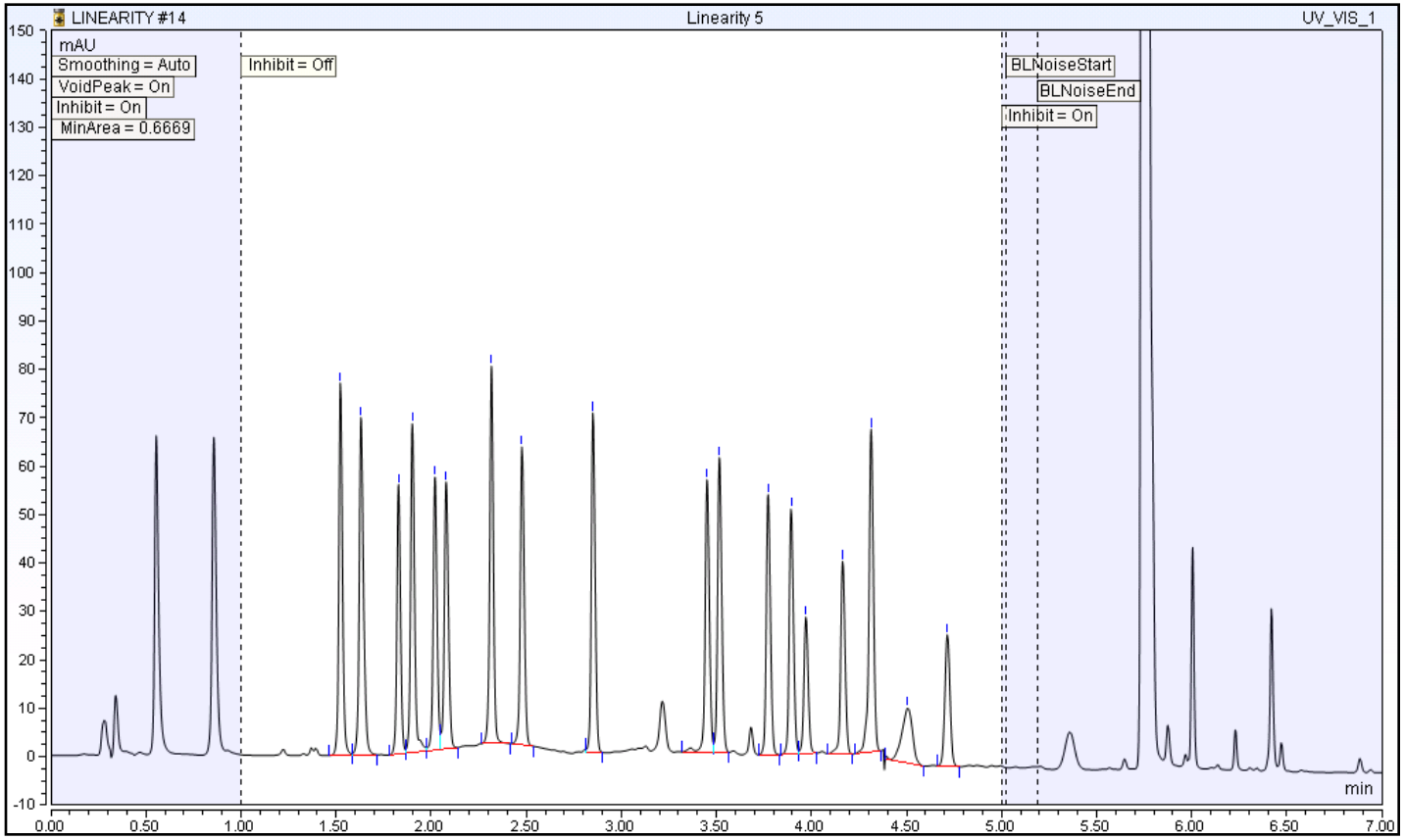


Define the Integration Range

Select the Narrowest Peak to Be Integrated

Select the Smallest Peak to Be Integrated

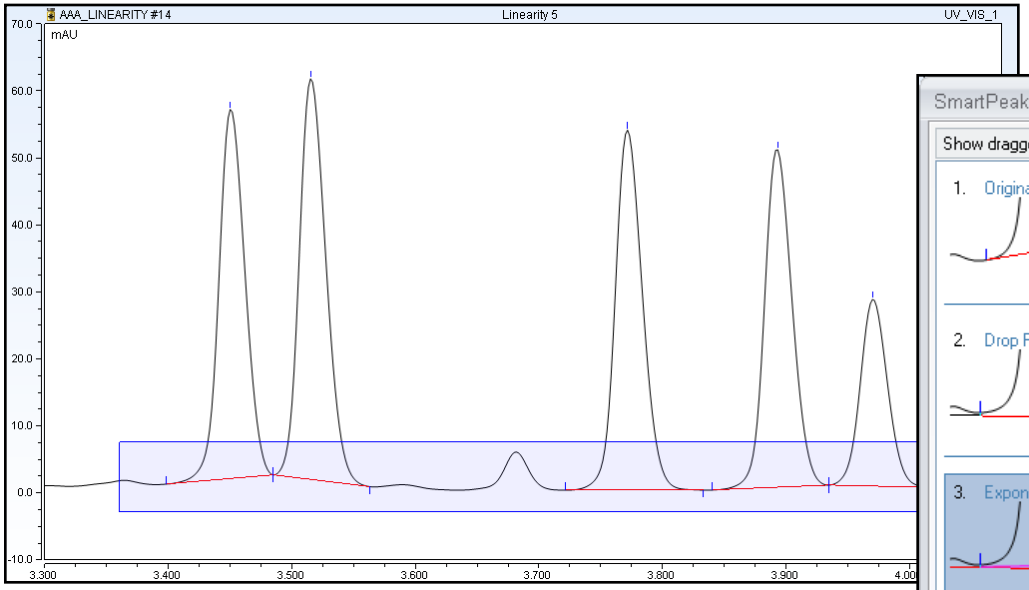
Cobra™ Peak Detection Algorithm

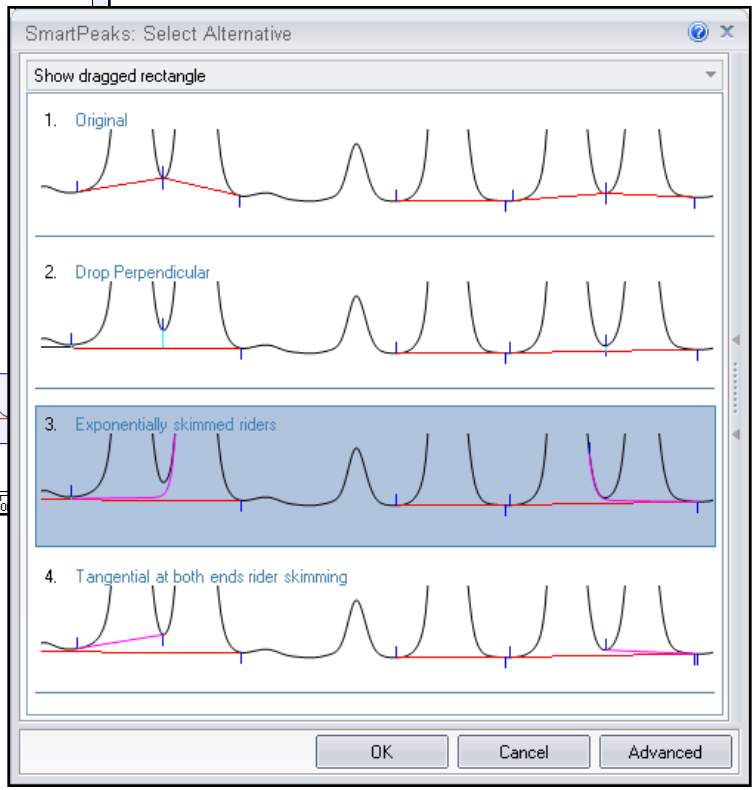


And Your Integration Is Done!

SmartPeaks™ Integration Assistant

Activate SmartPeaks Wizard

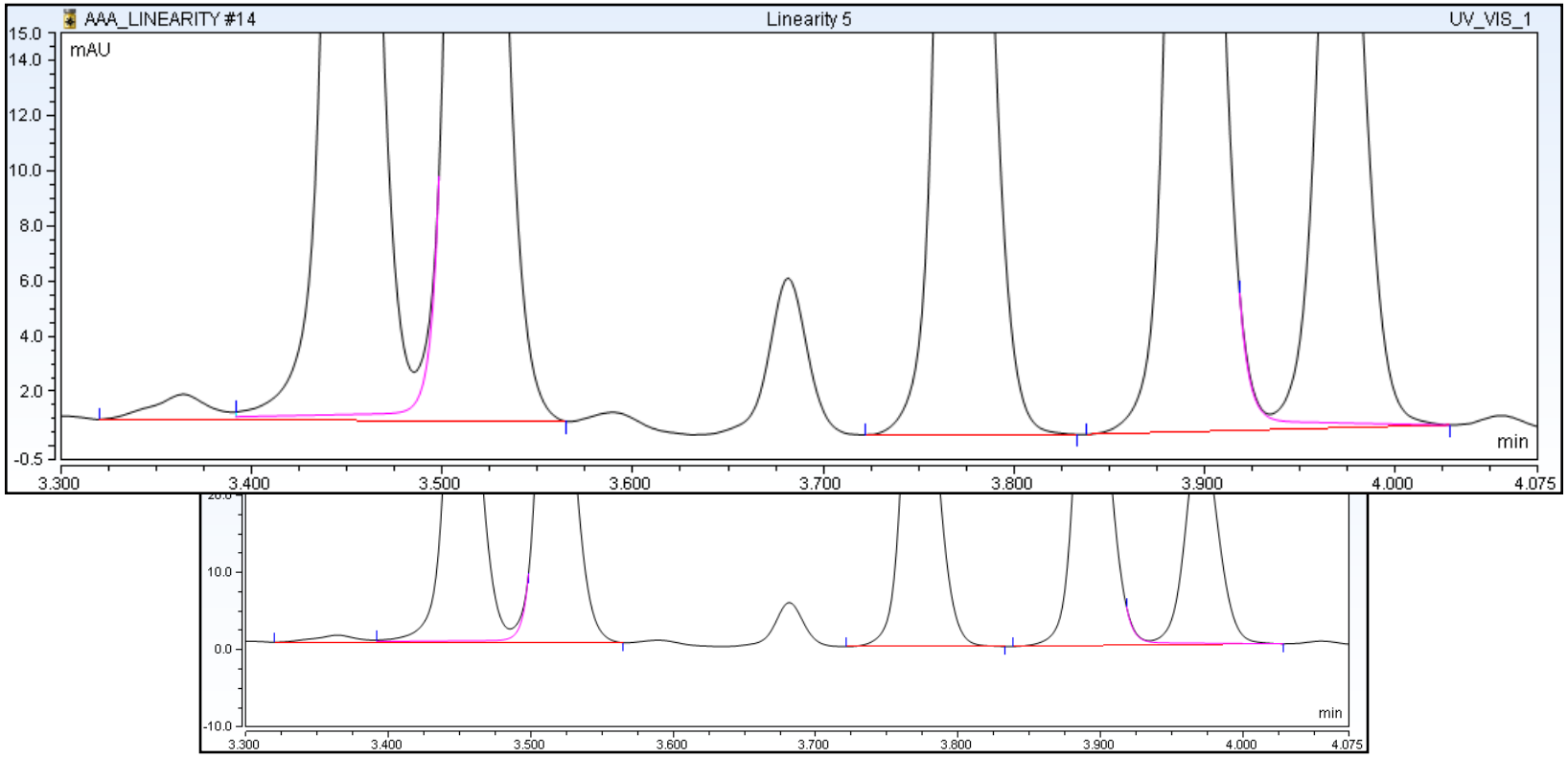




Select Area of Interest

Select the Integration You Want

SmartPeaks™ Integration Assistant



And Your Integration Is Done!

Chromeleon 7
eWorkflows

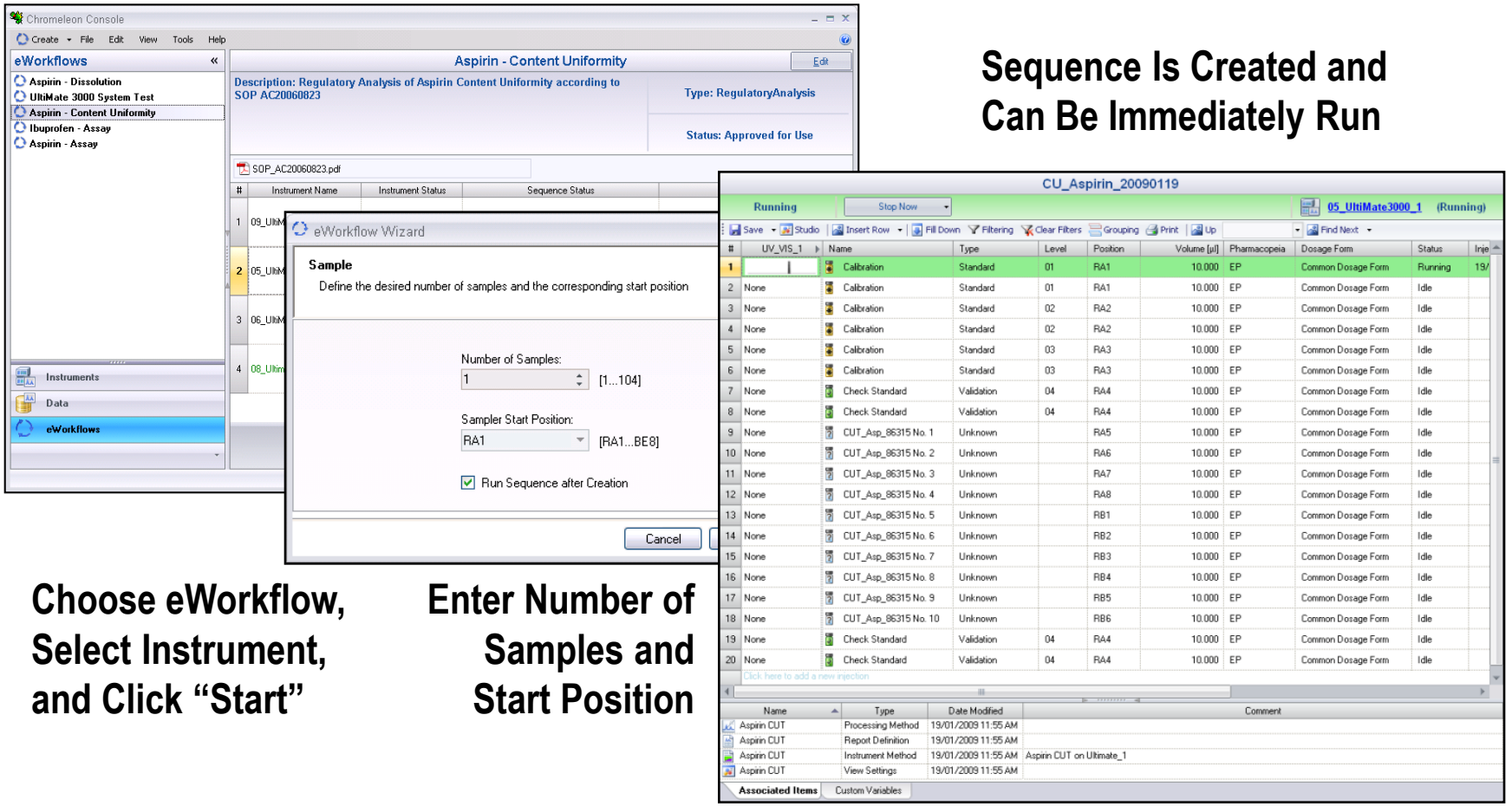
eWorkflows

- High-level automation of all chromatography processes
- Useful for all laboratory applications, such as:
  - Quality Analysis / Quality Control
  - Method development
  - Research and development
  - Walk-up analysis
- Take you from samples to results in only a few steps
- Easily customized to suit diverse applications and user skill levels

eWorkflows: All Aspects of a Chromatographic Analysis

- Instruments on which the analysis can be run
- All associated files:
  - Instrument methods
  - Processing methods
  - Reports
  - Spectral libraries
  - Documents with description of method
- Template for sequence name and storage location
- Custom variables
- Rules for sequence layout

eWorkflow for a Regulated USP/EP Method



Sequence Is Created and Can Be Immediately Run

Choose eWorkflow, Select Instrument, and Click "Start"

Enter Number of Samples and Start Position

eWorkflow for a Regulated USP/EP Method

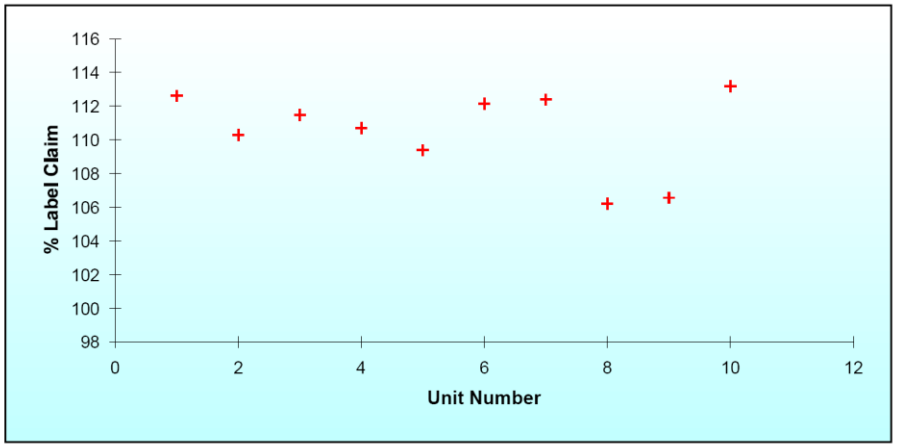
Uniformity of Dosage Units Report

General

Product Batch Number	**86315**	*Target Content T*	102.0
Peak Name	**Aspirin**	*Correction Factor*	1.050
CUT Number	186781	*Max. Acceptance Value L1*	15.0
Channel	UV_VIS_1	*Lower Amount Limit*	Not needed if n=10!
Dosage Form	Common Dosage Forms	*Upper Amount Limit*	Not needed if n=10!
Pharmacopeia	EP		

Results

	n = 10
Mean	110.5
Standard Deviation s	2.5
Reference Value M	102.0
Acceptance Value AV	14.4
Test Result	**Test passed**



This eWorkflow Also:

- Processes all data
- Calculates all results

Closing Remarks

Usability in Practice: Key Attributes of Chromeleon 7

- ***Visual:*** Taking advantage of the human brain's fast visual processing
- ***Contextual:*** Displaying items only when and where they are relevant
- ***Predictable:*** Appearing and behaving consistently, and as expected
- ***Discoverable:*** Inviting exploration without creating distraction
- ***Helpful:*** Allowing only valid choices, displaying useful tips, providing easy access to more information

ISO Slide Number

Easy to learn, efficient to use

Chromeleon 7—Simply Intelligent

- Provides the **intelligent functionality** needed to generate results
- Minimizes time and effort through **Operational Simplicity**™
  - New user interface with Console for navigation, Studio for analysis
  - Cobra™ peak detection algorithm and SmartPeaks™ integration assistant
  - eWorkflows—**the** framework for operational simplicity
- Establishes new benchmarks for usability and productivity

Thanks for attending!

DIONEX

Passion. Power. Productivity.