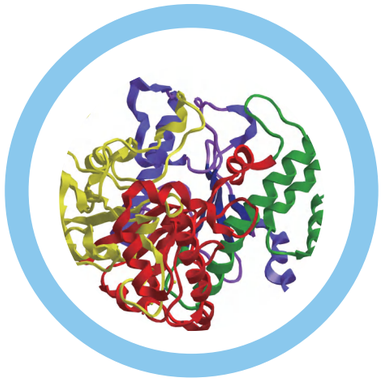

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SPS Protein Chromatography System

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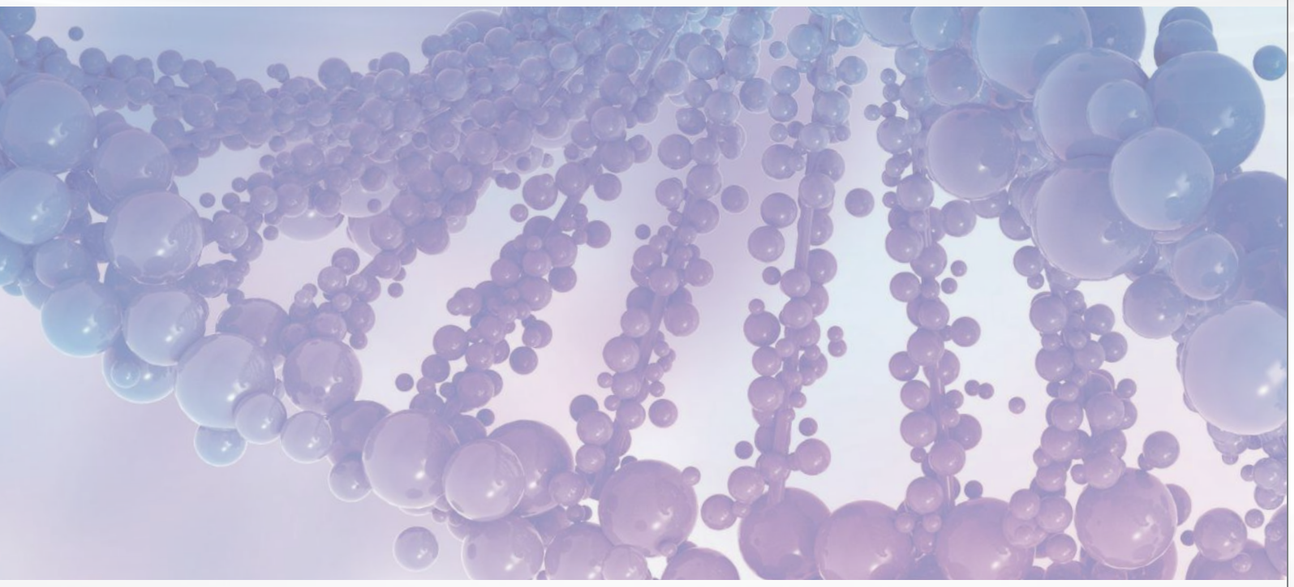
About us



Yocell Biotechnology was founded in 2016, with a team of energetic young scientists and engineers. We are committed to providing biotech scientists and engineers around the world with the most reliable solutions and specialized, dependable equipment for biotech downstream processes. Our main products include bioreactors/fermenters, centrifuges, high pressure homogenizers, filtration systems, chromatography systems as well as finished product filling and general laboratory equipment. Yocell relies on a professional technical service team and sales team to provide efficient and high quality services to customers. Accepting the challenge of constant innovation in biotechnology and solving problems from multiple perspectives are the most impressive qualities of the team.

Pragmatic

Always listen carefully to your needs and provide the most competitive solutions.

Efficient

Respond quickly and have a strong supply chain to ensure fast delivery.

Focus

Continuous attention and passion for innovation in the field of biotechnology control.

Feature Highlights

1. Compact structure with a simple and flexible configuration, easy to operate and use.
2. High-precision plunger pump with titanium alloy pump heads ensure stable and reproducible flow rates, as well as better biocompatibility and corrosion resistance.
3. Adaptable to a wide range of columns and packings, supporting manual or automatic fraction collection, and easy to combine with detectors (e.g., UV, pH, conductivity monitoring).
4. Single pump system with inlet 3-way valve for buffer selection and gradient formation.
5. The single pump system reduces cost and maintenance while maintaining performance, making it ideal for primary screening and routine purification.

1. System pump
2. Mixer
3. System pressure sensor
4. Dual channel inlet valve
5. Injection valve
6. Column valve
7. Column pressure sensor
8. UV detector
9. Cond/Temp detector
10. pH detector
11. Dual channel outlet valve
12. Fraction collector

The SPS protein chromatography system is a small, compact chromatography system designed for laboratory-scale protein purification, desalting and small-scale preparation. With a single pump drive, the system is compact, easy to operate, and has excellent stability and reproducibility to meet the diverse needs of researchers in the purification of biomolecules.

Technical Parameter

Model		YC-SPS025	YC-SPS150
System pump	Type	Piston pump, titanium alloy material	
	Flow rate	0.001-25mL/min	0.01-150mL/min
	Flow rate accuracy	±1.2%	±1.2%
	Flow rate precision	RSD<0.5%	RSD<0.5%
	Pressure range	0-34Mpa	0-10Mpa
MIxer	Type	Magnetic stirring electric mixer	
	Volume	Standard: 1.4mL	Standard: 2mL
		Optional: 0.6mL	Optional: 5mL
UV detector	Wavelength range	**F2**-Fixed dual wavelength 254+280nm	
Conductivity detector	Detection range	0.001- 999.999mS/ cm	
	Detection accuracy	±2%	
Temperature detector	Detection range	0-100℃	
	Detection accuracy	±1℃	
Valve	Automatic injection valve	Supports load, inject, waste, Max. working pressure: 3000psi	
	Inlet valve	2 channel inlet valve	
	Outlet valve	2 channel outlet valve	
Accessories	Workstation	Chrom X software	
	Installation toolkit	Includes PEEK/PTFE pipe, pipe connectors, column clamp, back pressure valve, installation manual, common tools	
Optional Configuration	pH detector	Detection range: 0-14	
	Column valve	Five column valve, can be connected to 5 column, supports forward and reverse flushing, bypass function, withstand pressure:3000 psi	
	Column pressure sensor	Detection of pre- and post-column pressure	
	Bubble sensor	External bubble sensor (ultrasonic bubble sensor, are not in contact with the liquid)	
	Fraction collector	Supports automatic identification of double trays, support 96, 48, 24 deep hole plate, 1.5mL, 15, 50mL centrifugal tube tray collection	

YOCELL

Components

System pump

The SPS system can be equipped with one high- precision pump, the pump head is made of titanium alloy for better biocompatibility and corrosion resistance.

	YC-SPS025	YC-SPS150
System pump max flow rate	25mL/min	150mL/min
Max operating pressure	34MPa	10MPa
Operating viscosity range	0.35-10 cP	0.35-10 cP

The pump head has a self-flushing function， the pumps automatically flush the rear pistons and seals with 20% ethanol at a constant low flow rate. This prolongs the working life of the seal by keeping it moist and preventing salt crystals from settling on the piston.

Dynamic mixer

The mixer uses magnetic induction technology to achieve uniform buffer mixing during gradient operation. The choice of mixing pool volume depends on the flow rate and the type of buffer used. For higher flow rates or buffers that are difficult to mix, a larger mixing pool volume is required. The table shows the available mixing pool volume for each SPS system.

	YC-SPS025	YC-SPS150
Mixer volume(standard)	1.4mL	2mL
Mixer volume(Optional)	0.6mL	5mL

Injection valve

The very small internal flow path volume minimizes the possibility of sample loss and ensures the accuracy of sample injection. The injection valve can be used to manually fill the sample with a syringe to the sample ring and then injected into the column by a system pump.

Max. working pressure	Material
3000psi	PEEK

Column valve

Switching between up to 5 different column/chromatographic media eliminates the need to repeatedly plug in/remove the column for automated method or process development. The module incorporates a backwash flow path for rapid elution, sample concentration and column cleaning. The built- in bypass path enables automatic system initialization and cleaning.

Maximum working pressure	Material	Mode
3000psi	Peek	Internal bypass, forward, reverse

Outlet valve

Outlet valve enables the system to direct fluid to a fraction collector, waste, or other user- defined location.

2 Channel outlet valve has 2 outlet ports and one inlet port. The outlet valve enables the system to collect large volume fractions and can be used in conjunction with the fraction collector to complete the small volume component collection task.

Pressure sensor

System pressure sensor - located behind the system pump.

Pre and post column pressure sensors - located in the column switching valve or installed in front and behind the column.

These pressure sensors are used to monitor real- time pressure values at the corresponding position and protect the column and media from pressure exceeding preset limits. A pressure sensor measures the pressure in front of the column to protect the column hardware. Another sensor measures the pressure behind the column and calculates the pressure difference on the medium. If the differential pressure (Delta P) exceeds the preset limit, the run pauses or another operation is applied.

Max. working pressure	Material
3000psi	Titanium alloy

UV

SPS system offers fixed dual-wavelength UV detector, which provides two wavelength options, 254 and 280 nm. allowing for real-time online identification of target components.

Conductivity

The conductivity monitor measures the conductivity of the buffer and sample in order to monitor the true gradient online. The integrated temperature sensor in the conductivity flow cell corrects the conductivity changes caused by temperature in real time. Conductivity monitors have a wide reading range and are therefore able to monitor conductivity in different chromatographic techniques.

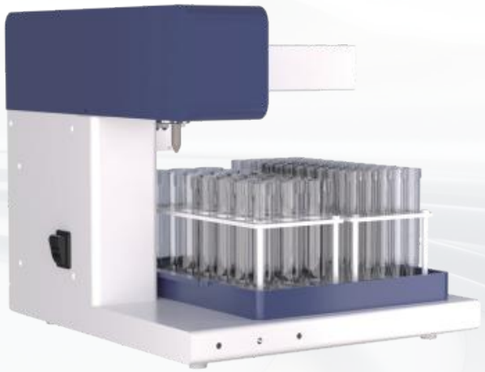
Max. working pressure	Conductivity reading range
300psi	0.001- 999.999mS/ cm

pH detector

The pH electrode monitors the pH value in real time during operation.

Fraction collector

- YCFC fraction collector, utilizes RFID technology to automatically detect the type of collection racks.
- The independent collection arm design prevents liquid splashing during the collection process, and the software includes a built-in delay volume to ensure precise positioning of each component during collection. The built-in collector calibration program facilitates easy maintenance.
- YCFC supports various collection containers, including 1.5mL, 15mL, 50mL and 24/48/96-well plate modes. The collection modes are diverse, allowing for collection based on time, volume, threshold and slope to meet various collection needs.



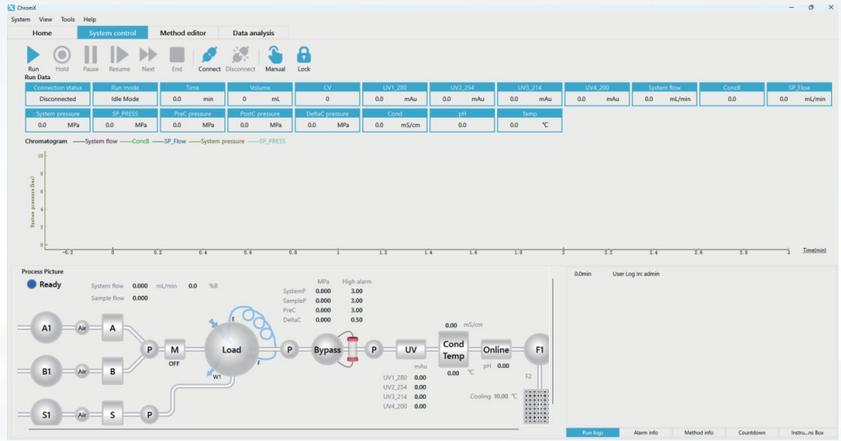
Software

ChromX software provides you with real- time control of your chromatographic system. ChromX consists of four modules: system management module, Method editor module, system control module and result analysis module. This section describes some of the valuable tools included in ChromX, where all modules work together to improve operational safety, efficiency, and productivity.

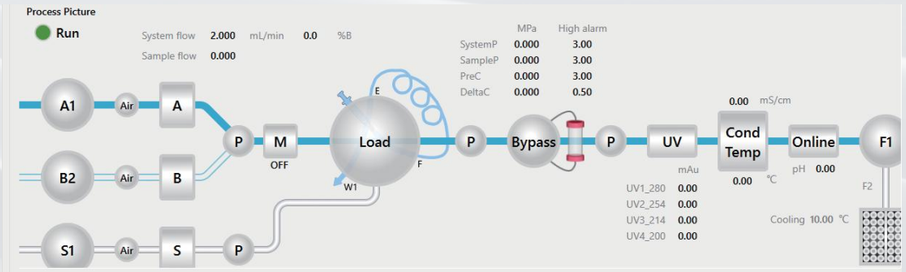
System control

The System Control module is used to start, view, and control method running. The module consists of three panes that provide an overview of the health status.

The Run Data pane displays the current data in numerical form, while the Chromatogram pane displays the data incurve form throughout the method run. The ProcessPicture pane shows the flow path during a run in real timeand can be used to control the run.



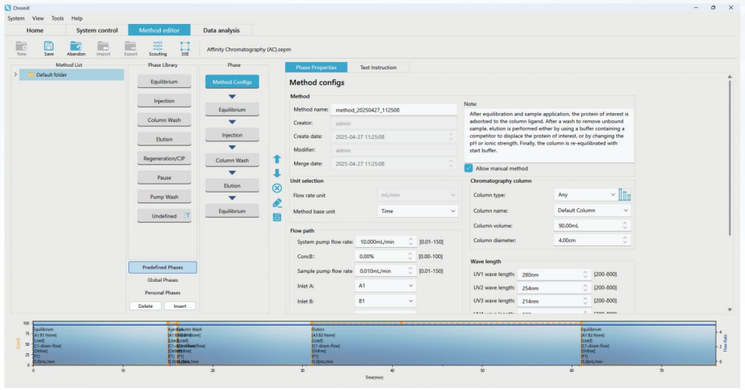
The color indication included in the flowchart shows an open flow path with current flow, a closed flow path, or an open flow path with no flow. Real- time data from the monitor is also displayed in the flow-chart pane.



Description: ChromX flowcharts show the current active and inactive flow paths and provide a quick and easy way to control the system

Method editor

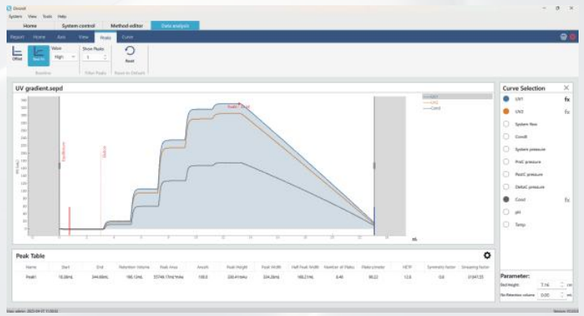
The Metho Editor module allows you to create or adapt methods to suit your application needs. It contains all the instructions used to control the run. The method editor includes built- in application support specifically for chromatographic runs.



Through this interface, you can easily view and edit the running parameters. The image on the left shows a screenshot of the method editor with customizable panes that provide a comprehensive overview of the operation. The method editor allows you to select predefined methods for different chromatography techniques and maintenance procedures. Methods are built using phases. Each stage reflects a step in the operation, such as loading or cleaning. ChromX includes a pre- defined Phase Library for creating or editing your own methods. Methods are created or edited by dragging and dropping Phases from the phase library to the Method Phases.ChromX includes a library of predefined chromatographic columns. By selecting chromatographic columns in the Phase Properties pane, chromatographic column parameters, such as flow rate and pressure limits, are automatically programmed into the method. For added flexibility, advanced users can view programming Instructions directly in the Text Instructions pane.

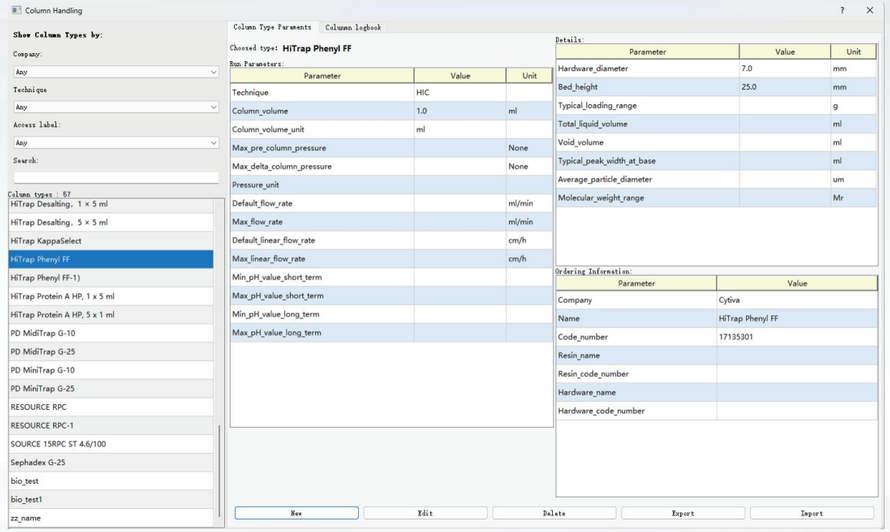
Results analysis

With ChromX, the Results Analysis (Evaluation) module provides a simplified user interface optimized for the most commonly used workflows, such as rapid analysis,results comparison, and processing of peaks and components



Chromatographic column logbook

In order to improve operation safety, the software can be optional Column Logbook function.



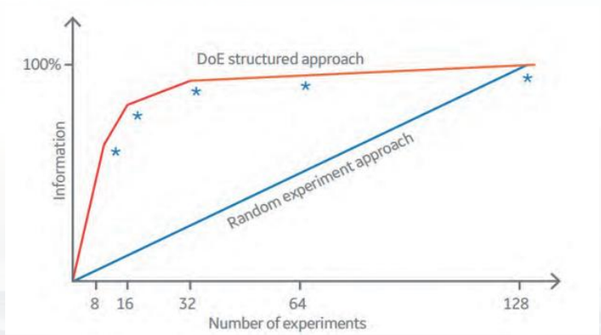
The utility tracks important operational data related to individual chromatographic columns to provide traceability and operational safety. Many preassembled columns are labeled with barcodes and use a QR scanner to identify individual chromatographic columns, or you can manually input the information into the ChromX. Labels with pre- printed QR codes can be used for other chromatographic columns (e.g. chromatographic empty columns). By tracking individual chromatographic columns, data information such as total number of runs and maximum pressure is recorded for each run. Notification limits can be set, for example by defining a limit on the number of times the chromatographic column can be run between cleanings to notify the user when the chromatographic column is being maintained. The Column History feature provides a list of all the runs performed on a particular column.

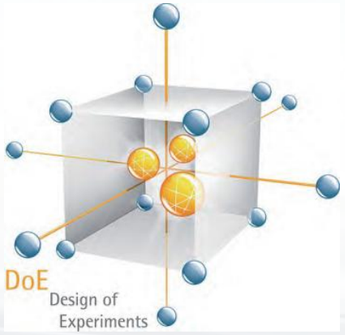
In addition to chromatographic column logs, ChromX offers electronic signatures, password protection, and audit trails for security.

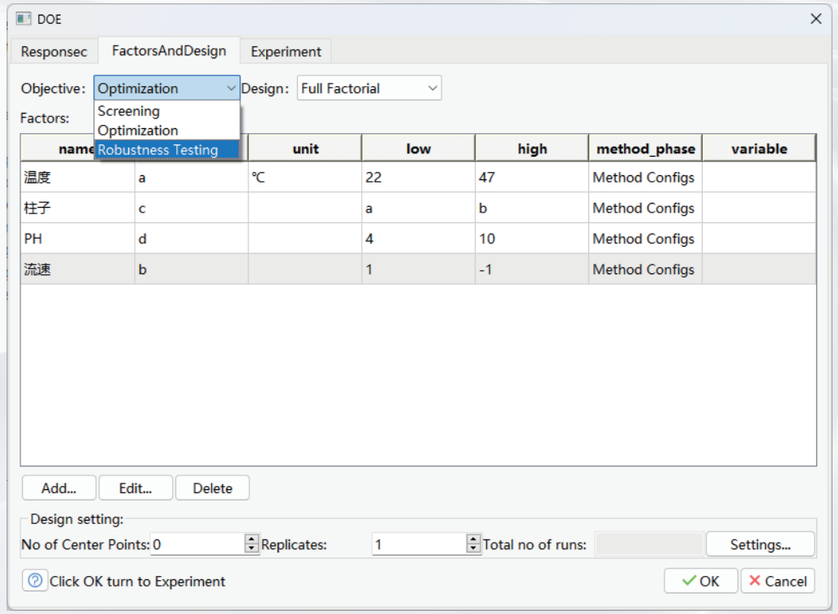
ChromX is able to comply with FDA21 CFR PART 11 standards for all types of compliance environments.

Design of experiments

The DOE function is a powerful tool for an efficient approach to method optimization. ChromX software will have an integrated Design of Experiments (DOE) functionality. In the traditional approach, optimal conditions can be determined by varying one parameter at a time while the rest of the parameters are kept fixed. Important information, such as interaction data between different parameters, might be missed. DoE is an organized, statistical approach that varies multiple factors simultaneously to significantly reduce th e number of required experiments . The effect of all parameters and their interactions are detected and described in a validated statistical model. Scouting methods are automatically generated from DOE schemes, allowing fast and efficient method optimization.Experimental workflows in DoE include:







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