# YL9100 HPLC

Think Smart  Work Better

**Young Lin's HPLC** is built to provide an exceptional cost/performance ratio.

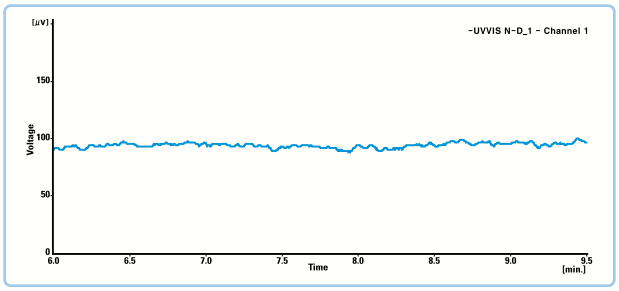
Continued research and development provide high-end performance and features, whilst a state of the art manufacturing facility ensures that quality is not compromised.

With more than 20 years experience and development,
we are proud to present our new generation of HPLC, **YL9100 HPLC**.

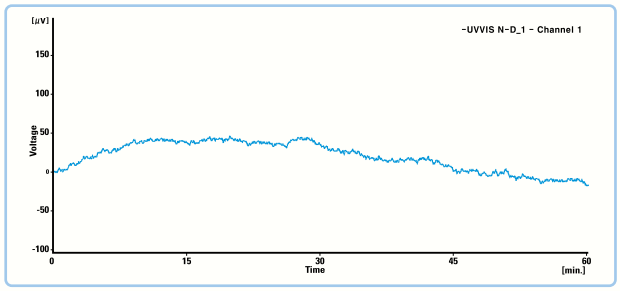
> When the time came to replace the ageing HPLC equipment in my laboratory, the YL9100 exceeded my expectations, but not my budget. We now have great looking, modern HPLCs, with the performance and functionality I required, yet at a fraction of the price I expected. The Windows XP/Vista based CDS has proved to be a great success with my analysts.

# Remarkable **Stability**

Analysts can waste their time waiting for excessive baseline noise and drift to stabilize.
The YL9100 HPLC delivers a very stable baseline to maximize analysis up-time.

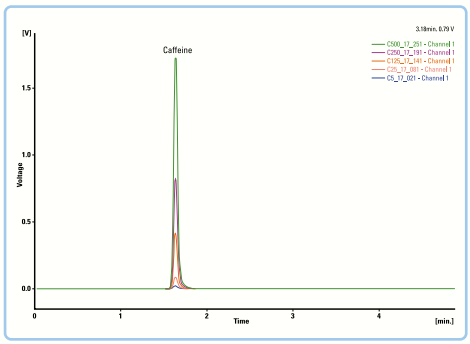


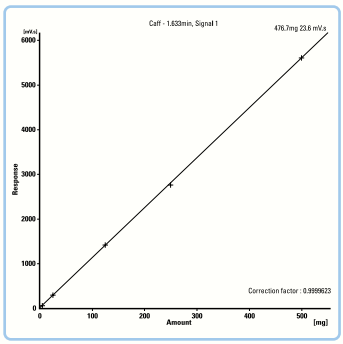

Noise




Drift

With automatic compressibility compensation minimising back-flow in the pump, the YL9100 HPLC provides accurate and precise flow rates.



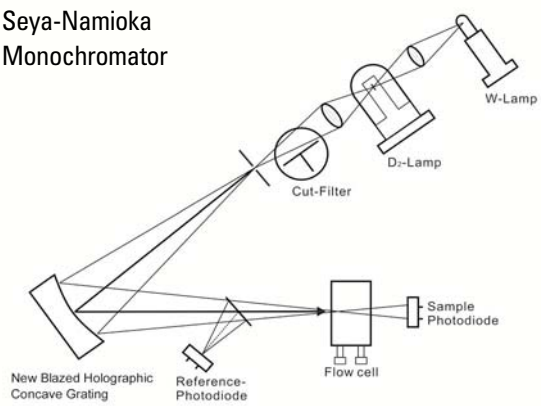




# Superior **Sensitivity**

One of many innovative features of the YL9100 HPLC is shielded optic design, which protects the optical components from dangerous contaminants such as fine dust or harmful gases, providing high detection sensitivity.

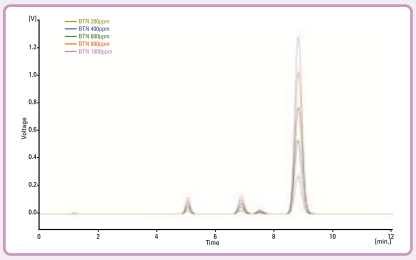
In addition, the Seya-Namioka Monochromator and a new Blazed Holographic Concave Grating enhance light intensity, ensuring high sensitivity over the entire wavelength range.

Seya-Namioka Monochromator



# Outstanding **Reliability**

Reliability is an essential feature of the modern HPLC and the YL9100 absolutely meets this demand.

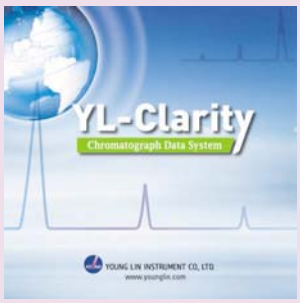


- YL9101 vacuum degasser perfectly removes dissolved gases and air bubbles, with the added convenience of an integrated tray to safely house solvent bottles.
- Automatic rinsing extends the life of the pump seals.
- YL9130 Column Compartment with Peltier cooling providing a wide range of temperature from 4℃ up to 90℃. Effective temperature control ensures retention time reproducibility and reliable data. Column temperature can also be used to improve separation performance and analysis times.

# Powerful and Intuitive **Control**

## Features

The sophisticated YL-Clarity and Autochro-3000 data system are easy to use and offers extensive data management plus full control of the entire YL9100 HPLC products and YL6100 GC. The software is designed for 21 CFR Part 11 Compliance and through full compatibility with MS Windows XP and Vista seamlessly handles data processing and instrument control using an ultra-reliable LAN interface.





## 21 CFR Part 11 compliance

### User accounts

YL-Clarity sets up access rights and passwords (including their parameters e.g., minimum length, validity, etc.). Each user can define the appearance of their own station.

### Audit trail

It records selected events and operations into a special file and selected operations directly into a chromatogram.

### Electronic signature

Each chromatogram can be signed electronically. Signature selection is based on the username or the signature certificate.

## Data Acquisition

### Overlay

YL-Clarity simultaneously displays a virtually unlimited number of chromatograms and their mathematical modification; for example, mutual deductions or derivations of any order.

### Measuring

Simultaneous data acquisition from up to four independent chromatographs, each chromatograph can acquire data from up to 12 detectors.

# Reliable and Convenient Data Management

## Integration

There are extensive possibilities to optimize integration. The integration parameters can be changed by entering global parameters or interactively, through direct graphic modification of the baseline.

## Calibration

Internal and external standard calculation methods, calibration of groups of peaks and reference peaks method for better identification.

## Postrun

YL-Clarity automatically displays, prints, exports and starts other programs after the completion of a measurement.

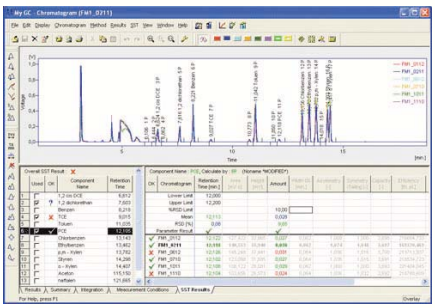
## User calculations

Users can define custom calculations in the Result and Summary tables. Using the integrated editor you can create your own columns from original columns and individual mathematical functions.

# Optional Module (YL-Clarity)

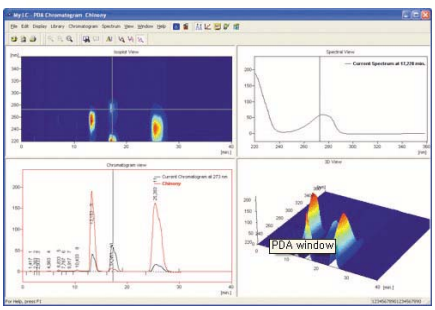
## SST (System Suitability Test)

The program compares up to 12 selected parameters calculated according to one of three pre-selected methods (USP, EP, and JP). These calculated values are either compared to the users set limit values for each chromatogram separately or together for the selected series.



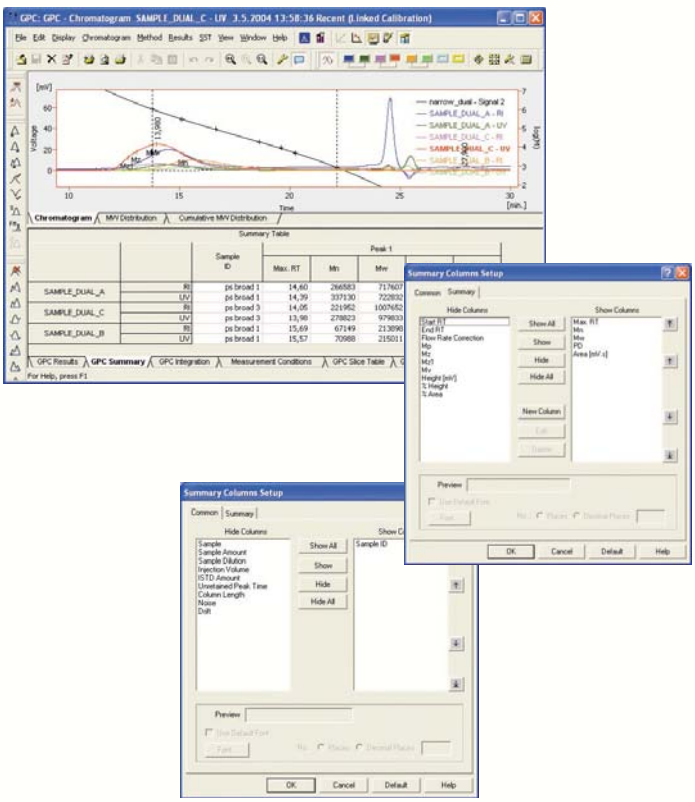
## PDA Extension

This is to process data that has been acquired from selected photo diode array detectors. The spectral data, together with chromatograms, adds a third dimension to analytical data analysis.




## GPC Extension

This provides interactive and automated GPC analysis, including recalibration and GPC reporting, as well as simplifies the retrieval of GPC data



# Specifications

## Solvent Delivery Pump

### YL9110 Quaternary Pump

- Operating principle :
  Parallel dual-plunger pump,
  Low-pressure gradient
- Number of Solvent : up to 4 solvents
- Gradient formation : 4-channel mixing valve
- Composition Precision : <0.1%
- Composition Accuracy : <0.5%

### YL9112 Isocratic Pump

- No mixing valve
- Operating principle : Parallel dual-plunger pump
- Easily upgraded to YL9110 Quaternary pump

### YL9111 Binary Pump

- Operating principle :

  Double Parallel dual-plunger pump,
  High-pressure gradient
- Number of Solvents : 2

### In Common

- Compressibility compensation : Automatic
- Flow range: - Analytical : 0.001-10ml/min
  - Semi-prep : 0.01-50ml/min
- Flow rate accuracy : ≤±1% at 1ml/min
- Flow rate precision : 0.1% RSD at 1ml/min
- Maximum pressure :
  - Analytical : 6000 psi
    > Operating range : 0-6000 psi up to 5ml/min
    > Operating range : 0-3000 psi at 5-10ml/min
  - Semi-prep : 3500 psi
    > Operating range : 0-3500 psi up to 35ml/min
    > Operating range : 0-2500 psi at 35-50ml/min
- Semi-automatic prime/purge
- Safety & maintenance : Leak detection, Diagnostics, Error detection

## TP Control Module for YL9100 Series Pump (Stand-alone type)

This pump key controller is for the use of process or the use of single unit itself.
It can control all functions of pump and indicate each factor clearly.


### Function

- Method Programming
- Solvent Mixing Rate
- Prime / Purge
- Flow Calibration
- Maintenance Control
- Pressure Zero

### Features

- 4.2 inch wide, vivid and sensitive LCD touch screen
- Logical instrument monitoring
- Method programming and keeping
- For the use of process /
  For the use of single unit

# Detector

## YL9120 UV/Vis Detector

- Wavelength Range : 190-900 nm
- Data collection rate : up to 50Hz
- Light Source : Deuterium lamp & tungsten lamp
- Noise level : $<\pm 0.5 \times 10^{-5}$ AU , 254nm, dry cell
- Drift : $<1 \times 10^{-4}$ AU/hr
- Bandwidth : 5.5 nm
- Wavelength Accuracy : ±1 nm
- Wavelength Precision : ±0.1nm
- Linearity : >99.5% for 2.5 AU (acetone, 254nm)
- Path Length : 10 mm ( Analytical cell ) / 3 mm ( Semi-prep cell )
- Cell Volume : 10 uL ( Analytical cell ) / 5 uL ( Semi-prep cell )

## YL9160 PDA Detector

- Slit Bandwidth : 1.7 nm
- No. of PDA Channel : 1024
- Pixel Resolution : 0.9 nm
- Wavelength : 190~950 nm
- Analytical Cell
  - Path-length : 10 mm
  - Pressure : < 1500 psi
  - Volume : 13 ul
- Semi-prep cell
  - Path-length : 3 mm
  - Pressure : < 1500 psi
  - Volume : 5 ul
- Noise Level : $< \pm 2 \times 10^{-5}$ AU (Empty Cell, 1sec Rise Time, 254nm)
- Drift : $< 2 \times 10^{-4}$ AU/hr (Baseline Correction), 0.001AU/hr (Room Temp)
- Wavelength Accuracy : < 1 nm (HY-1 Holmium Oxide Filter)
- GLP Compliance: - Photometric Accuracy, Linearity, Noise Level, Drift
  - System Check

## YL9170 Refractive Index Detector

- RI Range : 1.00 ~ 1.75 RIU
- Noise : $\leq 5 \times 10^{-9}$ RIU (Analytical) / $\leq 10 \times 10^{-8}$ RIU (Semi-prep)
- Flow Cell Volume : 9 ul (Analytical) / 7 ul (Semi-prep)
- Cell pressure : 6 kg/cm$^2$ (84 psi)
- RS232 Control

## YL9180 ELSD

- More Sensitive
- General Laboratory

## YL9181 ELSD (Evaporative Light Scattering Detector)

- Highly Sensitive
- Advanced Research
- Cooling Down to 10° C for Chamber

- Patented Thermo-Split : Vapor Phase Control for optimum sensitivity
- Very low detector volume resulting in the smallest peak within 3 sec.
- A single multi-flow, nebulizer for use with micro-bore to semi-preparative flow rates.

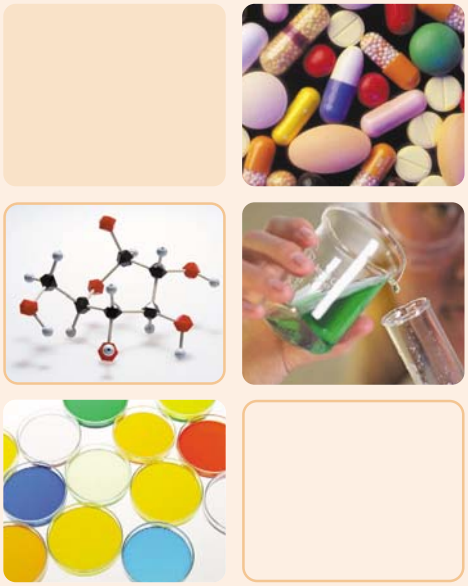
## Other Detectors

### Electrochemical Detector(ECD)

ECD is a detector for HPLC applied to variable analyses such as biogenic amines, phenols, vitamins, DNA adducts, inorganic ions and amino acids.

### Fluorescence Detector(FLD)

FLD is a highly sensitive, scanning fluorescence detector for liquid chromatography.
It provides exceptional optical performance and operational flexibility for routine and trace analysis.



## Vacuum Degasser

### YL9101 Vacuum Degasser

- Number of channel : 4 Channels
- Maximum flow rate : 10 ml/min per channel
  > 0 ~ 2.0ml/min per channel for 70% Gas Removed from Methanol
- Internal volume per channel : 925 ul per channel
- Materials in contact with solvent
  : Teflon® AF and PEEK

## Column Compartment

### YL9131 Column Compartment

- Temperature range : 4° C (Cooling) - 90° C
- Temperature stability : ±0.05° C
- Temperature accuracy : ±0.5° C
- Temperature programs : 40 Steps
- Column capacity : - Analytical : Max. 3ea of 30cm column(Max. OD 18mm)
  - Semi-prep : Max. 2ea of 30cm column
- Heat-up time : 16 minutes from 4° C to 90° C
- Cool-down time : 13 minutes from 90° C to 4° C
- Column switching : max. two automatic 6-port valve (optional)

# Autosampler

## YL9150 Autosampler (Alias)

The YL9150 is a high-throughput autosampler with state of the art injection technology, fast injection and wash cycles, and an optional Peltier chiller/heater for samples. Full or partial loop injection along with Pressure-Assisted-Sample-Aspiration (PASA™ ) is possible.

The highly efficient needle and internal capillary wash virtually eliminates sample carry-over. Cycle time, including wash, is less than one minute.

96 standard 2ml vials (32mm x 12mm) or well plates (96 or 384 capacity, deep or shallow) can be used.

- Sample capacity :
  - Analytical : 2 Micro Well Plates according to SBS standards
  - Semi-prep : 24 vials of 10 mL (LSV)
- Loop volume : 1 - 5000 μℓ programmable, 10 mL loop optional
- Reproducibility : RSD ≤ 0.3% for full loop injections
  RSD ≤ 0.5% for partial loopfill injections
  RSD ≤ 1.0% for μℓ pickup injections
- Carry-over : < 0.05 %
- RS232 Control
- Cooling option : down to 4℃

## YL9151 Autosampler (OPTIMAS)

The YL9151 provides the optimum balance of economics and performance, optimizing your injection automaiton, with a carousel holder for sample vial flexibility.

With its three injection modes including zero sample loss injection, YL9151 rivals top-class autosampler performance, while challenging middle-class autosampler prices.

- Capacity : 84 standards 2ml vials
- Control : Keypad / Software control by RS-232

# Manual Sample Injector

## Rheodyne 7725i / 9725i

- Industry standard manual injector
- Analytical : 7725i(SUS) and 9725i(PEEK)
- Semi-prep : 3725i

# Optimized HPLC
# **Post-Column Derivatization system**

Pickering Laboratories, Inc., California, USA, a leading company of post-column derivatization chemistries and technology, has made a contract to supply the post-column derivatization system based on our YL9100 HPLC system. The PINNACLE PCX combined with YL9100 HPLC system offers the complete package of chemicals, columns, methods and post-column systems and reflects the ease of use, reliability and ruggedness you have come to expect.

- Powerful Software Control
- Electronic Syringe Pump & Valve
- Flexible Reactor
- Column Heater Fast & Stable
- Usability Design
- Special Columns & Chemistries

## Chromatograms

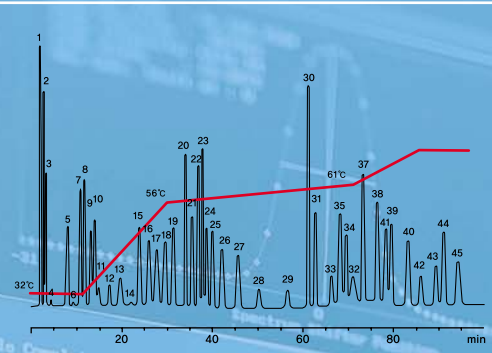



Figure 1. High-efficiency Lithium for Physiological samples using temperature gradient

1. Phosphoserine
2. Taurine
3. Phosphoethanolamine
4. Urea
5. Aspartic acid
6. Hydroxyproline
7. Threonine
8. Serine
9. Aspargine
10. Glutamic acid
11. Glutamine
12. Sarcosine
13. a-Aminoadipic acid
14. Proline
15. Glycine
16. Alanine
17. Citrulline
18. $\alpha$-Amino-n-butyric acid
19. Valine
20. Cystine
21. Methionine
22. Allo-isoleucine
23. Cystathionine
24. Isoleucine
25. Leucine
26. Tyrosine
27. Phenylalanine
28. $\beta$-Alanine
29. $\beta$-Amino-i-butyric acid
30. Homocystine
31. $\gamma$-Aminobutyric acid
32. Tryptophan
33. Ethanolamine
34. Hydroxylysines
35. Ammonia
36. Creatinine
37. Ornithine
38. Lysine
39. Histidine
40. 3-Methylhistidine
41. 1-Methylhistidine
42. Anserine
43. Carnosine
44. Homocarnosine
45. Arginie

## Specifications

### Reagent Pump

- Pulse free syringe pump
- Single piece ceramic barrel
- Programmable flow rate
- Flow range : 50 - 1500 ul/min
- Automatic piston wash
- Automatic reagent flush cycle

### Reactor

- Heated reactor for temperature from 5° C above ambient to 130° C
- Easy replacement coil cartridges
- Range of reactor dwell volumes; 0.1 mL to 3mL

### Column Heater

- Programmable temperature gradient
- Easy Column access

### Safeguards

- In line check valve : prevent reagent back flow
- Replaceable column & reagent filters
- Post column system over pressure
- Back-pressure regulator: Applies 7 bar (100 psi) to the detector flow cell outlet (waste) to prevent detector noise and precipitation due to out-gassing or boiling

# Versatile Dedicated Analyzers

We provide customized systems with analysis methods and application that completely meet analysis purpose and requirement for convenience in your lab.

## Formaldehyde Analyzer

It delivers the optimum solution for derivatization analysis of formaldehyde with the appropriate system configuration according to Indoor Air Quality Management which is getting interested in recent years.

## Amino Acid Analyzer

With the Post-Column derivatization method, it can analyze natural amino acid or hydrolyzed amino acid with a supreme sensitivity.

## Carbamate Analyzer

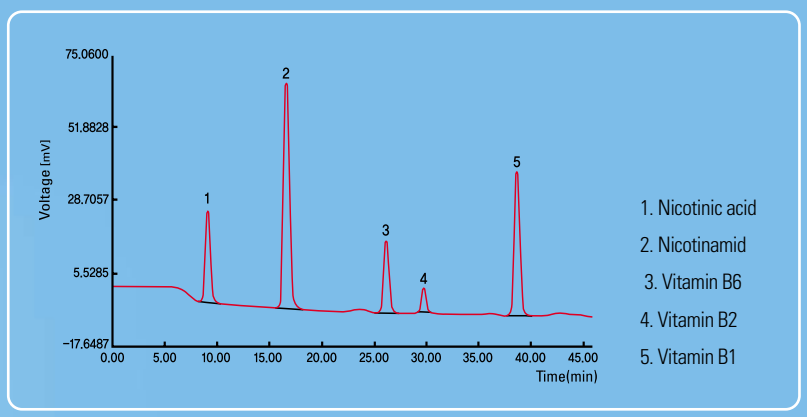
The analysis of pesticide using Post-Column derivatization gives analysis and quantitative analysis by automatic sample preparation at the same time.

## Catecholamine Analyzer

It provides all the solutions such as a sample preparation, a short time to stabilize the ECD (Electrochemical detector), setting for optimum condition, keeping the sensitivity and replacement and cleaning of cell.

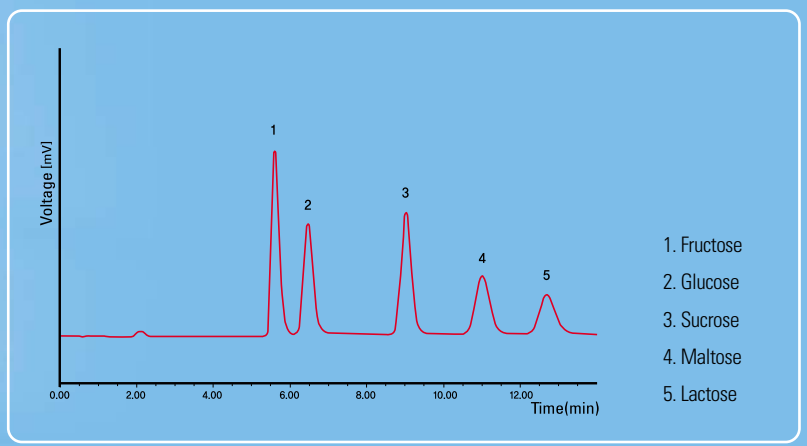
## Vitamin Analyzer

Vitamins are unstable compounds, which are easily oxidized and destroyed during sample preparation procedures. This specified vitamin analyzer is optimized for the analysis of both water-soluble and fat-soluble vitamins by supplying entire solutions.




## Sugar Analyzer

This system provides a simple, easy and highly sensitive method of detecting sugars.



These Products are manufactured by Young Lin
ISO 9001-certified facility that is periodically
audited by the registering body to ensure compliance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