Application Solution

GENSTECH
基 泰 科 仪

Focus on used analytical instrument

Primer Synthesis Industry

Shanghai Genstech Technology Co.,Ltd
Mail: sales@genstech.com.cn
Website: www.genstech.com.cn

Content

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➢–Primer Synthesis Industry

Preparation and purification

Quality Control

High-end research

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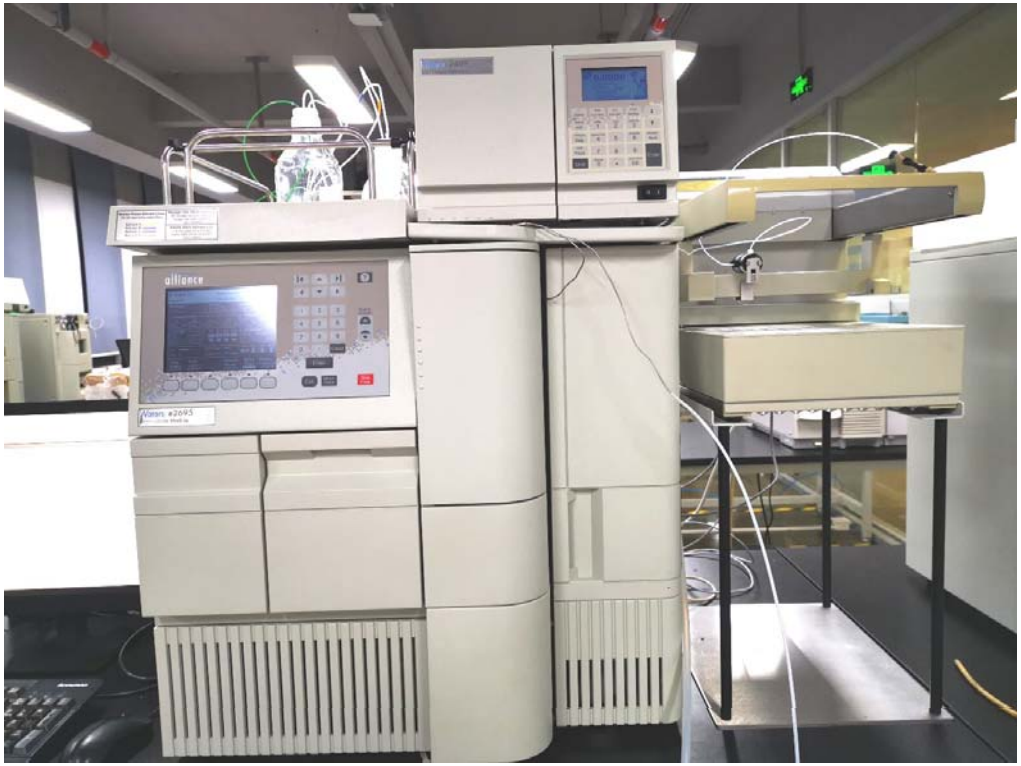
➢ Recommand 1-Analytical Preparative Purification

Industry characteristics： The purification amount of single preparation is small, we can use analytical purification



Waters 2695/2795+2487+WFC III

- ✓ Can purify a limited number of samples, especially fine nucleotide samples
- ✓ Addition of fraction collection collector WFC III with automatic collection of components based on common analytical HPLC for automated collection
- ✓ A variety of detectors are available for trigger collection, and general nucleotide purification uses UV detectors.
- ✓ Powerful data processing with Empower chromatography software
- ✓ Based on the precise gradient elution capability of Waters 2695/2795, more impurities can be separated, and higher purity nucleotide products can be collected, even after one purification, the purity of nucleotide reaches more than 95%
- ✓ Suitable for purification of short-chain and longer-chain nucleotides, generally used to purify common primer samples and modified primer samples above 2OD

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➢ Recommand 2-Analytical Preparative Purification

Industry characteristics： The purification amount of single preparation is small, we can use analytical purification

Automatic analytical purification system with Agilent 1200 fraction collector system

- ✓ Can purify a limited number of samples, especially fine nucleotide samples
- ✓ Use Agilent Openlab Chemstation software, easy to operate and maintain
- ✓ A variety of detectors are available for trigger collection, and usually uses VWD detectors for nucleotide purification
- ✓ Based on precise gradient elution capability of Agilent's high-precision quaternary pump or binary pump, it can separate more impurities, and collect higher purity nucleotide products, even after one purification, the purity of nucleotide reaches more than 95%
- ✓ Fraction collector can collect most 4 plates of 96 well by tubes the remand.
- ✓ It is suitable for the purification of short or long chain nucleotides, and generally applies to the purification of ordinary primer samples and modified primer samples with more than 2 OD

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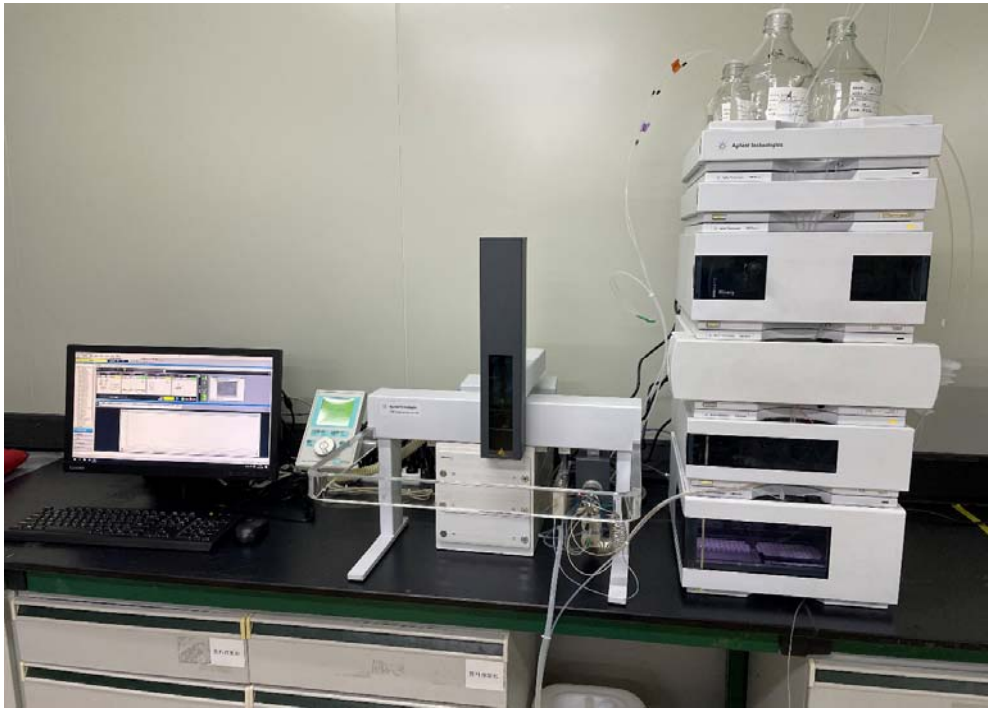
➢ Recommand 3-Analytical Preparative Purification

Industry characteristics： The purification amount of single preparation is small, we can use analytical purification



Automatic analytical purification system with Agilent 1200 HPLC+CTC

- ✓ Use Agilent 1200 HPLC with G1364C collection model, can equal to Waters analytical purification
- ✓ The CTC injector replaces Agilent's original injector, which can allow up to six 96-hole plates to inject samples, thus achieving highly automated injection
- ✓ Use Agilent Openlab Chemstation software can control CTC sampler, easy to operate and maintain
- ✓ Extremely fast gradient elution: according to customer application, the fastest purification time of each nucleotide sample can be reduced to less than 7 min, and the purity of purified DNA can reach more than 90%
- ✓ It is suitable for the purification of short and long chain nucleotides, and generally applies to the purification of ordinary primer samples and modified primer samples within 2 OD

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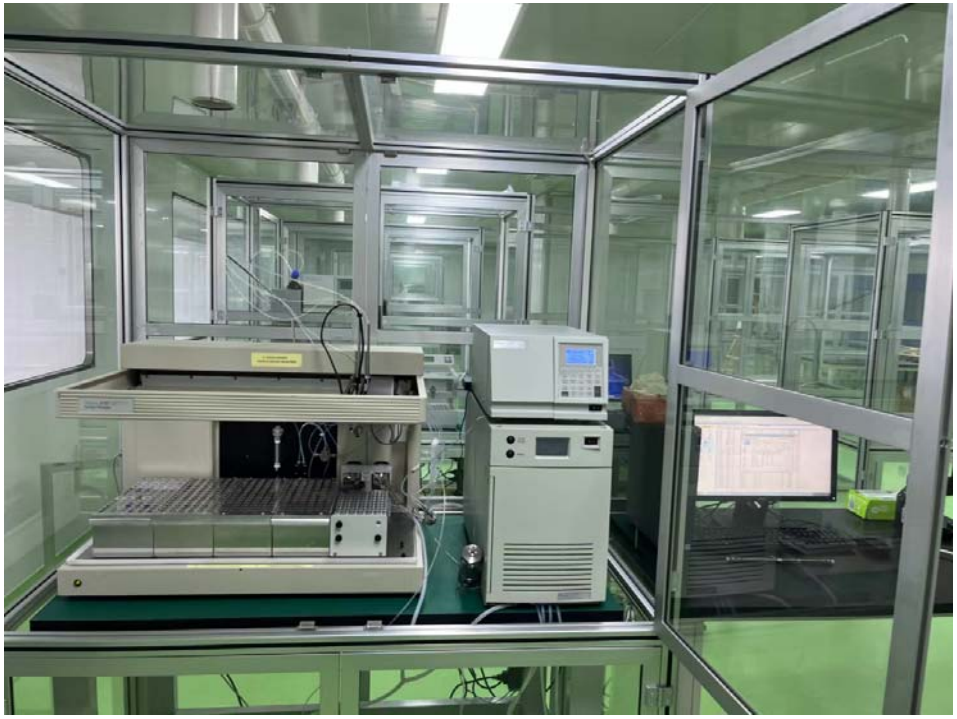
➢ Recommend 1:Semi-preparation purification

suitable for large amount of nucleotides purification , and the single preparation amount can reach 200~2000 OD



Waters 2767 semi-preparative purification (UV guidance)

- ✓ Waters 2767 sample manager, including injector and distillate collector
- ✓ Waters 2545/2525 binary gradient high-pressure preparation pump (flow rate range 0.5-150ml/min)
- ✓ Waters 2489 dual-wavelength ultraviolet detector (with semi-preparative flow cell)
- ✓ Waters MassLynx V4.1 analysis software and Waters FractionLynx distillate collection software
- ✓ It can be used for the preparation of several milligrams to tens of milligrams of nucleotides, fully automated UV-guided purification, and 24-hour unattended purification

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➢ **Recommend 3 :Semi-preparation purification**

suitable for large amount of nucleotides purification , and the single preparation amount can reach 200~2000 OD

GE AKTA Explorer 100 FPLC including Frac-950 collector

- ✓ Rapid purification of a variety of biological molecules, such as proteins, polysaccharides, peptides, oligonucleotides, nucleotide vaccines, viruses and natural small molecules (TCM), suitable for separation and purification of active substances. Its automated configuration is especially suitable for method optimization and process development
- ✓ Simple and quick start: pre-programmed application process, programming template, automatic buffer preparation
- ✓ Fully automated: automated from injection, programming, separation, peak collection, accurate result comparison, data processing, and print reporting
- ✓ Standardized with a variety of automated configurations: automatic buffer selection, automatic sample selection, automatic column selection, automatic selection of collection locations and collection methods, automatic flow selection for method optimization and process development
- ✓ Artificial intelligence: a variety of buffer formulations (built-in 17 formulations, can be added by themselves), more than one hundred column database, a variety of purification programs, built-in chromatography experts
- ✓ Three-wavelength UV/visible light detection: combined with pH and on-line conductivity detection, it can fully grasp the online separation effect, pollutant removal and product identification

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➢ Quality Control

HTCS Nucleic Acid Mass Spectrometry Detection System (based on Thermo LTQ/LTQ XL/LTQ VELOS/VELOS PRO MS)

HTCS system based on Thermo LTQ mass spectrometry

- ✓ The HTCS Nucleic Acid Mass Spectrometry System is called the High-Throughput Characterization System, which is developed for the rapid identification of molecular weights of polymer compounds such as DNA and RNA in the bioengineering field.
- ✓ Based on the excellent qualitative identification function of Thermo LTQ series enhanced ion trap mass spectrometer, the rapid sampling characteristics of CTC PAL high-speed sampler and the exclusive Promass mass spectrometry analysis software can process the original molecular weight information of the compounds to be measured in one key
- ✓ High throughput: With a two-column switching system, more than 2,000 samples can be injected and processed per day, with an average of one sample taken every one minute.
- ✓ Powerful data processing function can perform multi-charge decomposing of DNA and RNA samples with one button, output results in color-coded mode, and customize template information of output results, making identification work simple, fast and accurate.

- ◆ **Advantages: superior mass spectrometry, fast scanning speed and easy maintenance**
- ◆ **Nucleotide detection range: Based on a large number of user detection data analysis, the LTCS system based HTCS system has a superior detection effect within a nucleotide molecular weight of 50,000.**

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➢ Quality Control

Separated nucleic acid mass spectrometry detection system (based on LTQ series mass spectrometry)

Nucleic acid mass spectrometry detection system based on Thermo LTQ series mass spectrometry

- ✓ Based on the excellent separation ability of Waters Acquisition UPLC and the perfect qualitative ability of Thermo LTQ mass spectrometry
- ✓ Excellent UPLC compound separation ability allows impurities to be separated, so that the molecular weight information of small impurities and main peaks can be detected individually
- ✓ The flux is lower than that of HTCS system, but the detection effect is good

- ◆ **Advantages: the mixture has the best separation effect and can handle the molecular weight research of impurities**
- ◆ **Features: the platform can give consideration to both sensitivity and chromatographic separation effect, with high detection flux and very good detection quality**

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➢ Quality Control

UPLC analysis the primer purity

Waters H-Class UPLC

- ✓ Ultra Performance LC
- ✓ Waters H-Class UPLC optimizes the system, which is more suitable for all-day high frequency use
- ✓ Based on finer (1.7um particle size)
- ✓ chromatographic column particlesFaster analysis speed
- ✓ Increase sensitivity
- ✓ Increase component resolution
- ✓ Increase the system back pressure (hardware support is required for high back pressure)
- ✓ TUV ultraviolet detector or FLR fluorescence detector

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➢ Recommend 1: High-End Research On Nucleic Acid Drugs

Thermo Q Exactive Series HRMS

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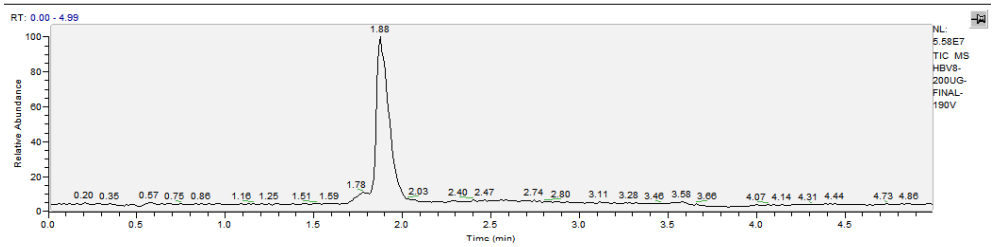

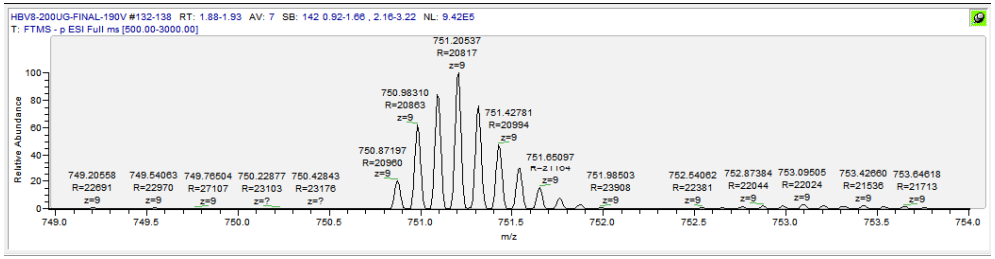

- The perfect combination of UPLC and Thermo QE series HRMS can provide the highest chromatographic speed, sensitivity and resolution, and effectively separate the co-effluents, which is the best choice for the new generation HRMS
- Nucleotide samples can be detected and can obtain high-resolution information, which is the most ideal detection platform for impurity identification

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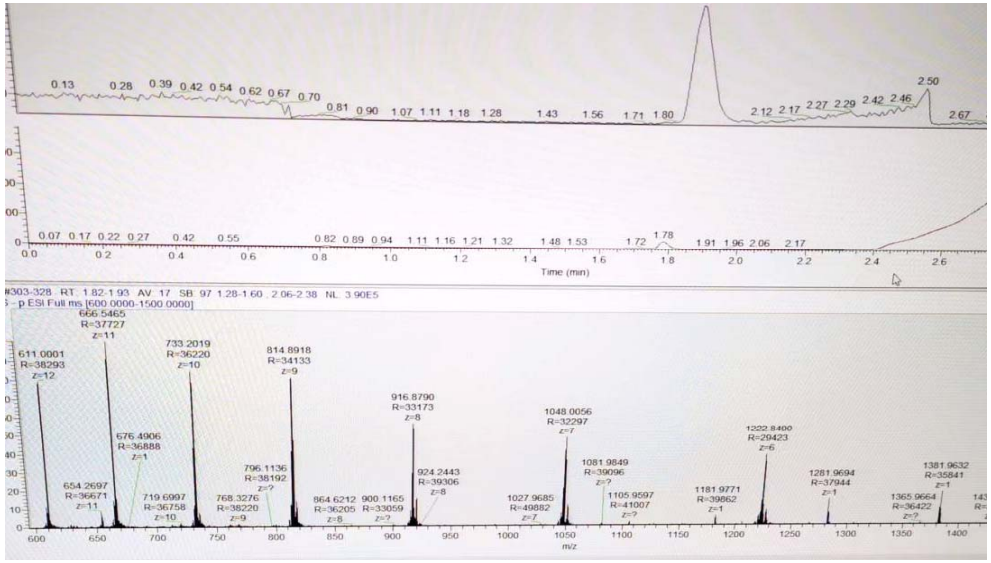
➢ Recommend 2: High-End Research On Nucleic Acid Drugs

Thermo LTQ-Orbitrap VELOS PRO

Thermo LTQ-Orbitrap VELOS PRO



- The perfect combination of UPLC and LTQ-Orbitrap VELOS can provide the highest chromatographic speed, sensitivity and resolution for efficient separation of co-effluents, while LTQ-Orbitrap VELOS provides ultra-high resolution, sensitivity and collection speed, and is an ideal mass spectrometer detector after UPLC separationNucleotide samples can be detected and can obtain high-resolution information, which is the most ideal detection platform for impurity identification

Shanghai Genstech Technology Co.,Ltd
Tel: 4000680868
Web: www.genstech.com.cn