



# INSTRUMENTS FOR AUTOMATED PEPTIDE SYNTHESIS

TRANSFORMING PEPTIDE SYNTHESIS FOR OVER 30 YEARS  
FROM RESEARCH TO PRODUCTION

Purity  
Productivity  
Power



## MARKET LEADERS IN PEPTIDE SYNTHESIZERS SINCE 1985

Established in 1985, Protein Technologies Inc (PTI) was one of the first companies to produce automated peptide synthesizers for the pharmaceutical, cosmetic, and nutritional sectors.

### TRANSFORMING PEPTIDE SYNTHESIS FOR OVER 30 YEARS

PTI's founders were researchers affiliated with the University of Arizona's peptide synthesis research community. They paved the way for modern advances in automated peptide synthesis by developing high quality, solid-phase peptide synthesizers founded on the core values of purity, reliability and ingenuity — and a genuine interest in meeting fellow scientists' needs.

PTI became Gyros Protein Technologies in 2016 in the merger with Gyros AB, later becoming the Biopharmaceutical Development division of Mesa Laboratories, Inc.

Our peptide synthesizers have been sold worldwide and are used in applications from research scale to pilot manufacturing. Now, as Gyros Protein Technologies, we continue to lead the way in developing and producing unique instruments for the chemical synthesis of peptides from our original research and manufacturing base in Tucson, Arizona, USA. Sales and application support is provided globally.

### A SOLID REPUTATION

We continue to build on PTI's proven expertise and heritage by delivering reliable and robust products powering uncompromising productivity with the ability to synthesize high purity compounds. These attributes regularly earn our products five stars in scientific product reviews and our instruments are featured in over 500 peer-reviewed articles over a period of 5 years.

Reliability means designing and building with the highest quality and standards, proven by the many 15-20 years old instruments still in daily use. Dedicated support by experienced Application Scientists and Service Engineers helps customers accomplish the most difficult syntheses by providing in-depth knowledge and skills.

Since 1985 close to 1,300 of our peptide synthesizers have been installed worldwide.

## PIONEERS

Through innovation, we constantly stay one step ahead. In 1993, with the Symphony® peptide synthesizer, PTI pioneered automated parallel peptide synthesis with PurePep® Pathway, our proprietary valve block system.

The PurePep Pathway block system was revolutionary. It allowed any instrument with multiple reaction vessels to work in parallel. Instead of synthesizing 100 peptides a year, one could now synthesize thousands, shortening turnaround time so users could meet the demands of their organization and customers.

Today, PurePep Pathway is renowned for providing chemically inert pathways for synthesizing peptides with high purity and yield while minimizing cross-contamination, dead volumes and reagent carryover.

Other innovations offer increased flexibility to meet multiple user demands, such as:

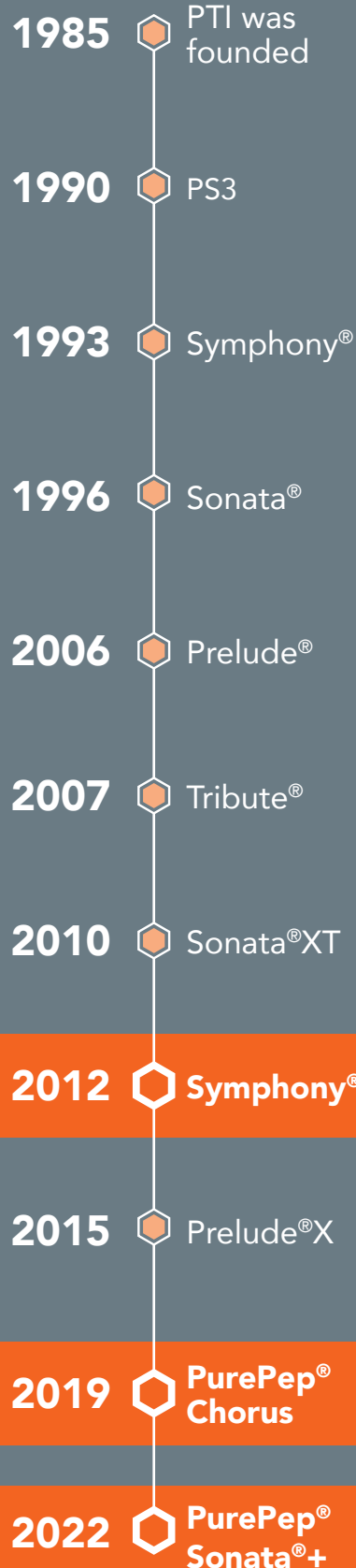
- Single-Shot™ deliveries to save the use of custom monomers, introduced with the Prelude® synthesizer
- Intellisynth® real-time UV monitoring and IR heating to help minimize trial and error when synthesizing peptides, introduced in the Tribute® synthesizer
- Induction heating that optimizes the synthesis of challenging peptides, first provided on the Prelude® X synthesizer

## CONTINUALLY INNOVATING

We remain committed to building on our heritage and continually increasing our products' performance through innovative solutions. As a consequence, our last generation instruments PurePep Chorus, Symphony X and PurePep Sonata+ combine the best of our hardware and software features, covering 3 different scales of peptide synthesis for diverse applications.

The latest addition to our product line (the PurePep Sonata+) is another milestone in our long history of innovation, that reinforces user confidence in our peptide synthesizers for research, development and pilot-scale synthesis.

# OUR HISTORY



● current products are highlighted in orange

## USERS WHO TRUST US WORLDWIDE

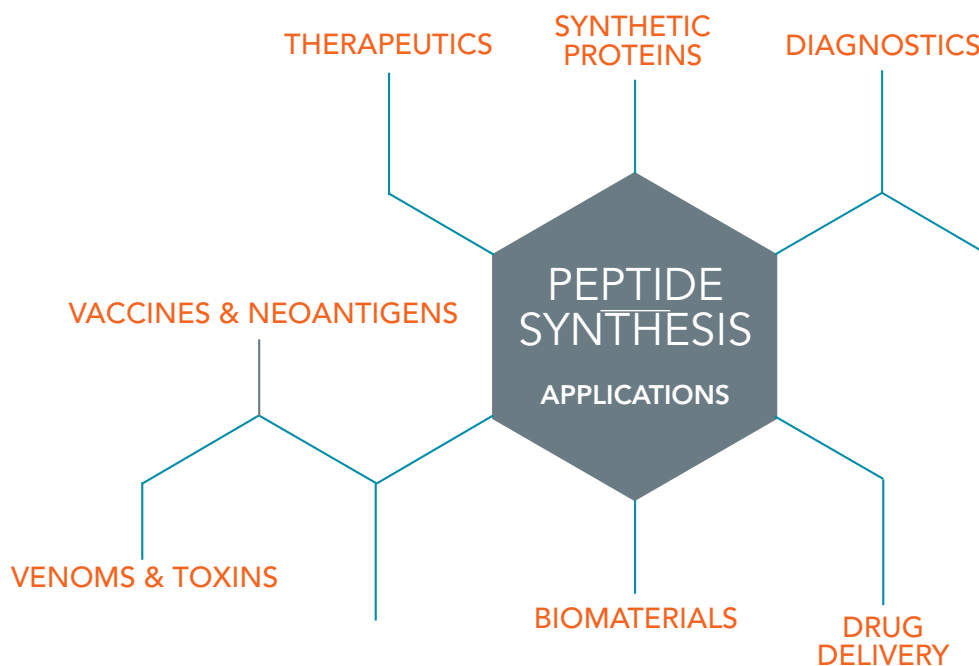
Gyros Protein Technologies' peptide synthesizers and reagents are used by scientists in universities as well as biopharma companies worldwide to deliver uncompromising peptide purity — in applications from discovery to cGMP manufacturing and pre-clinical studies.

The biopharma industry segment represents the most significant component of our customer base. For decades, our systems have been a trusted technology in many CMOs and CROs and a productive tool in major biotech and pharmaceutical companies.

## FROM SIMPLE TO COMPLEX PEPTIDES

Our instruments are used to synthesize simple and complex peptides in many translational research areas such as pain management, Alzheimer's disease, cancer, metabolic, cardiovascular, infectious and haematological diseases. Synthetic peptides are integral to cutting-edge R&D for vaccines and therapies to fight the COVID-19 pandemic and as neoantigens in cancer immunotherapy.

Progress in peptide-based research and the development of therapeutics and vaccines relies on peptides synthesized with optimized protocols. That is why we provide comprehensive application support.



“

*Our laboratory is new to the peptide synthesis world and Gyros Protein Technologies has been with us since the beginning of this journey. We had really good advice when choosing the equipment that best suited our current and future needs and the after-sales service has also been excellent.*

— Laura Teixidó Devesa, Clinisciences, SL —



## CHOOSING THE MOST SUITABLE PEPTIDE SYNTHESIZER

The ability to synthesize high purity peptides on a large scale or with multiple sequences in parallel is vital for applications from basic research to production in the fight against diseases.

Gyros Protein Technologies provides peptide synthesizers to match your needs in terms of purity, yield and scale, from 0.005 to 200 mmol. Whether your synthesis goal is combinatorial chemistry, small organic molecules, peptides (Fmoc or t-Boc), peptoids, or oligonucleotides, we have the right synthesizer for you.

All our instruments continue to stand for our founders' core values of Purity, Productivity, Power and the software is designed for

**21 CFR Part 11 Compliance.**

FIND OUT MORE:

**5** factors to consider when choosing a peptide synthesizer

SCAN QR-CODE



Learn more about our Peptide Synthesizers



PurePep® Chorus



Symphony® X



PurePep® Sonata®+

Numer of reaction Vessels	2, 4, 6 - upgradable	24	1
Synthesis scale range	5µmol – 1.0 mmol per RV (max. 6 mmol)	5µmol – 1.0 mmol per RV (max. 24 mmol)	1 mmol – 200 mmol
Reaction vessel volume	Plastic disposable – 10, 45 mL Borosilicate glass – 10, 25, 40 mL	Plastic disposable – 10, 45 mL Borosilicate glass – 10, 25, 40 mL	200 mL, 500 mL, 1.2 L, 2 L, 3.2 L, 4.2 L
Number of solvent positions	8	8	7
Number of amino acids positions	27 amino acid bottles (120 mL or 400 mL) or Single-Shot vials + 6 Single-Shot only positions	28 amino acid bottles (120 mL or 400 mL) or Single-Shot vials + 12 Single-Shot only positions	20 amino acid bottle positions 250 mL, 500 mL or 1L
Fluid measurement technique	Fixed loop measurement with optical sensors or timed deliveries	Fixed loop measurement with optical sensors	Real-Time Flow technology
Fluid transfer method	Positive pressure with nitrogen	Positive pressure with nitrogen	Positive pressure with nitrogen + pump for Solvent 1
Agitation method	Adjustable nitrogen bubbling and/or oscillating shaker mixing	Adjustable nitrogen bubbling (all positions) and/or oscillating shaker mixing (RV 1 only)	Adjustable nitrogen bubbling, variable vortexing, recirculation – alone or in combination
Optional heating method	Controlled induction heating, configurable to the number of RVs	Infra-Red heating (RV 1 only)	–
Intellisynth UV monitoring	Configurable to the number of RVs	RV 1 only	–
Cleavage	Online, automatic, programmable	Online, automatic, programmable	Online, automatic, programmable
Software	Icon driven PurePep Software Platform	Proprietary Symphony X control software	Icon driven PurePep Software Platform
21 CFR Part 11 Compliance/ cGMP ready	Yes	Yes	Yes

# INNOVATIVE TECHNOLOGIES INSIDE OUR INSTRUMENTS

## Intellisynth® UV MONITORING:

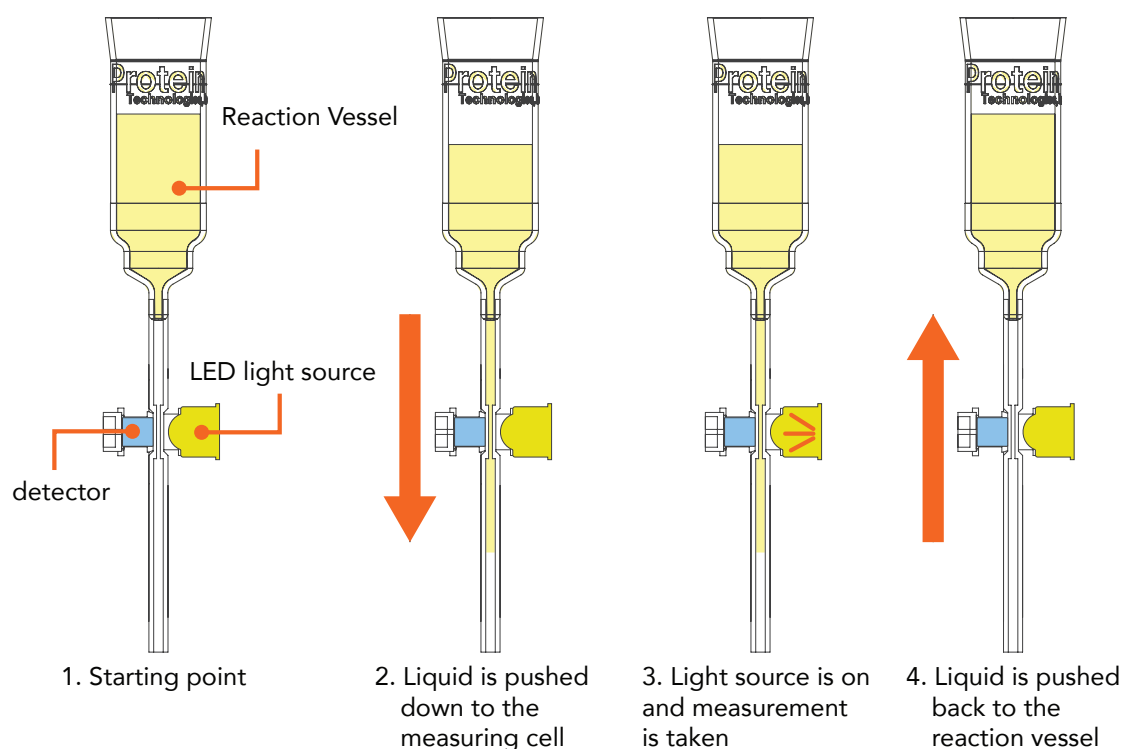
visualizes reaction progress during mixing

Proprietary Intellisynth real-time UV monitoring is available with Symphony X and PurePep Chorus. Symphony X can be optionally equipped with a UV module on the first of 24 reaction vessels. On PurePep Chorus, UV monitoring can be configured on as many reaction vessel pairs as desired, enabling automated optimization of the deprotection reaction.

Real-time UV data can be observed while synthesis runs and full data is available after completion. Individual

graphs show reaction progress during a cycle while summary graphs indicate differences in times and repetitions between different cycles, providing diagnostic information on synthetic trouble spots for difficult sequences.

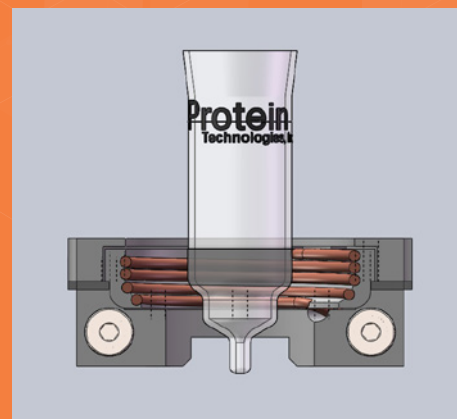
While other systems monitor the waste stream, Intellisynth monitors your reaction solution while it is mixing, allowing control of the deprotection reaction times, not just the number of repetitions. Find the right conditions the first time, without wasting reagents.



## INDUCTION HEATING:

accelerates chemistry and improves purity

Induction heating is a solution for fast reaction vessel heating used on PurePep Chorus. It accelerates chemistry and improves purity for difficult sequences and can be configured on as many reaction vessel pairs as you desire. Heating conditions in each reaction vessel can be independently set to enable temperature scans for process optimization or parallel synthesis of sequences with different protocols. View real-time temperature data while a synthesis is running and full profiles after completion.

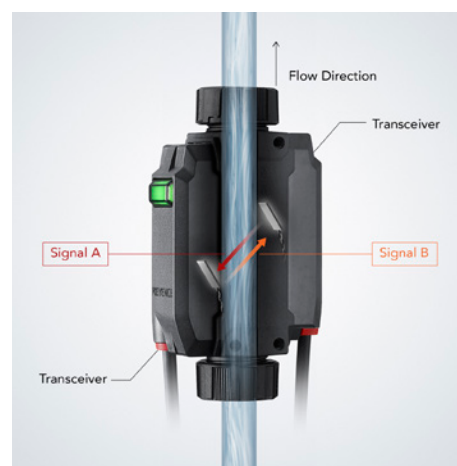


## REAL-TIME FLOW:

for accurate and precise delivery and minimal calibration

Real-Time Flow technology is unique to PurePep Sonata+. It continuously monitors flow rate of fluids for accurate and precise delivery. The solution is based on sonar technology in which sonar signals are sent through the liquid in both directions to determine how fast the fluid is flowing. The system is calibrated only once for fluids with different viscosities, to minimize calibration by the user and save time.

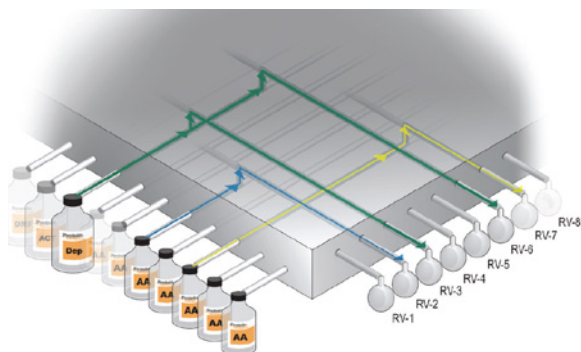
The technology is accurate and precise even if the flow rate changes, with <5% error across a range of fluids.



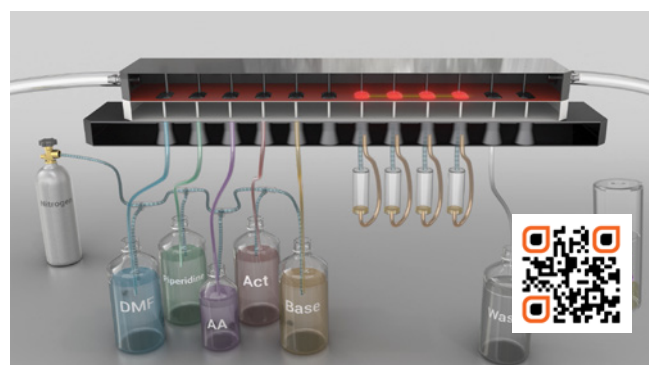
## PUREPEP PATHWAY 'INSIDE':

for reliable peptide purity

You will find the proprietary PurePep Pathway valve block and fluidic system in all our instruments. This innovative design results in zero dead volumes, no cross-contamination and worry-free performance that lasts for years. With the trusted PurePep Pathway, you have reliable peptide purity every time.



This proprietary matrix valve block system was specifically designed to minimize dead volumes, eliminating cross contamination and delivering peptides with high crude purity.



**Purity** starts with PurePep pathway inside with proprietary microfluidics that minimize cross-contamination, dead volumes, and reagent carryover.

[Scan the QR-code to learn more.](#)

Purity  
Productivity  
Power



# PurePepChorus

MULTI-SCALE SYNTHESIZER FOR SIMPLE  
TO COMPLEX PEPTIDES

## MODULAR DESIGN TO GROW WITH YOUR NEEDS

The award-winning, modular peptide synthesizer PurePep® Chorus is a robust, versatile and user-friendly instrument for producing outstanding quality peptides in academic or industry research settings. When under pressure to deliver results efficiently, PurePep Chorus is the reliable and scalable peptide synthesizer that meets the challenge.

A significant benefit of PurePep Chorus is its parallel and configurable design. Start with an affordable two reaction vessel configuration and expand to four or six to increase scale and throughput to meet future needs. Customize with independent induction heating and real-time UV monitoring when desired.

### PUREPEP CHORUS OVERVIEW

6x 50 mL Collection  
Vessels or 6 Additional  
Single-Shot Positions

Induction  
Heating Coils

Wireless Tablet

2, 4, or 6 Reaction Vessels

10 mL Single-Shot Vial

27 Amino Acid Reservoirs  
120 mL or 400 mL

Working Tray





## ADVANTAGES AT A GLANCE

- **Configurable parallel synthesis**

Modular and configurable for two, four or six reaction vessels, enabling synthesis of multiple peptides in parallel or sequentially.

- **Uncompromised purity**

Chemically inert valve block system, PurePep Pathway, with low dead volumes and no cross-contamination, rendering the highest purity and yield. Single-Shot™ amino acid delivery adds to retain the purity and saves expensive reagents.

- **Real-time UV monitoring to minimize trial-and-error**

Intellisynth real-time UV monitoring – monitors reaction solutions while mixing, optimizing reaction times and ensuring complete deprotection. Intellisynth can monitor up to six peptides in a single synthesis.

- **Controlled induction heating for effective peptide synthesis**

Simultaneous reactions at up to six different temperatures rapidly optimize chemistry. Target temperatures reached in 10-20 seconds improve purity of complex sequences. Complete control gives precise and reproducible synthesis.

- **Automated cleavage for improved throughput**

Fully automated and customizable cleavage provides improved throughput, higher safety and increases walkaway time for staff.

The PurePep Chorus builds on our expertise and heritage of building versatile, practical and robust instruments that stand the test of time.

## INTUITIVE SOFTWARE

The icon-driven PurePep Chorus software is designed with the chemists' productivity needs in mind. A handy detachable tablet means you can program synthesis wirelessly, and a guided workflow makes planning a run easy for everyone, from novices to experienced chemists. Software features include: Improved icon-driven software platform for intuitive, easy sequence and protocols programming and upgraded amino acids, solvents and reagents databases for speed and easy handling. Pre-programmed standard protocols and the ability to customize for ultimate flexibility.



- Icon-driven software platform for intuitive sequence and protocol programming. Pre-programmed standard protocols and the ability to customize for ultimate flexibility.

- The SafePep™ option, for automated rinsing of the resin in case of an error, ensuring no unwanted by-products or side reactions.

- Real-time UV data while synthesis is running with the complete data review after finished synthesis. Individual graphs and summary graphs provide valuable diagnostic information.

- Email notification for remote verification that your synthesis is running as planned or needs attention.

- **21 CFR Part 11** design ensures compliance with regulatory demands and includes user management, electronic signatures and audit trail.

IQ/OQ validation support and PQ guidance are also available, giving scientists in highly regulated cGMP laboratory environments confidence in incorporating PurePep Chorus.

“

*The Chorus has been a robust and versatile machine for our needs, regularly making a variety of linear and cyclic ~10 to 30mer peptides by Fmoc-based SPPS in an academic research setting. The ability to conduct several syntheses in parallel with automatic cleavage, all contained within the unit, really helps with throughput and safety to give us back time to do other things*

Oliver Coleman, Newcastle University

# Symphony® X

MAXIMUM FLEXIBILITY FOR RESEARCH,  
OPTIMIZATION AND PRODUCTION

## MAXIMUM THROUGHPUT AND FLEXIBILITY

Since its launch in 2012, the Symphony® X has become the gold standard in automated peptide synthesis for research, optimization, and cGMP production laboratories worldwide where it is valued as a flexible, parallel peptide production workhorse.

As a first-in-class 24-reaction vessel peptide synthesizer, Symphony X is ideally suited for meeting high production demands in peptide manufacturing. Proprietary Ultra PurePep Pathway technology at its core enables ad-hoc on-demand or parallel peptide synthesis with unbeatable throughput. Symphony X peptide purity is second to none while maintaining exceptional reliability and ease of operation.

## SYMPHONY X OVERVIEW





Purity  
Productivity  
Power

## ADVANTAGES AT A GLANCE

- **Maximum throughput with 24 independent channels**  
Symphony X was the first peptide synthesizer with 24 parallel but independent reaction vessels for on-demand synthesis capability and unbeatable throughput, making it cost-effective for high demand peptide manufacturing.
- **Uncompromised purity**  
Ultra PurePep Pathway technology with a dedicated microfluidic matrix valve block pathway for each reaction vessel allows labs to make exceptionally pure peptides on multiple reaction vessels while minimizing cross-contamination.
- **On-instrument automated cleavage**  
Convenient and automated post-synthesis cleavage with customizable programs and adjustable start times allows maximum laboratory flexibility.
- **Built for cGMP**  
Symphony X is designed for **21 CFR Part 11** regulatory compliance through a combination of user training, a comprehensive quality management system, and appropriate documentation, including IQ/OQ software.

## EXPERIENCE 24 PEPTIDE SYNTHESIZERS IN ONE

The power of 24 fully independent reaction vessels (12 with pre-activation) means operators can run different sequences, scales and protocols on multiple reactors all at the same time. Start, Stop or Pause reactors whenever you wish — it's like having 24 synthesizers in one.

With 24 fully independent channels and in-situ activation, new jobs can be started while others are running. This makes optimization fast and easy, reducing time to final product.

## OPTIMIZED SYNTHESIS TIME AND FLEXIBILITY

- Single-Shot™ deliveries for adding special monomers without priming minimizes waste and saves money since no manual interruption is required.
- Optional Intellisynth real-time UV monitoring while reaction solutions are mixing saves time by minimizing trial and error when synthesizing complex peptides.
- Optional Infrared (IR) heating speeds up synthesis time by reaching reaction temperatures in minimal time and ensures an even temperature profile with fully automated vortex mixing.

# PurePep Sonata+

MID-PILOT SCALE PEPTIDE SYNTHESIZER

## RELIABLE SCALE UP AND IMPROVED PRODUCTIVITY

The next generation PurePep® Sonata®+ replaces and builds on the quality and outstanding features of our single reaction vessel, mid-pilot scale peptide synthesizer Sonata® XT. PurePep Sonata+ delivers batch-to-batch reliability on a pre-production scale and productivity levels demanded by CROs/CMOs and pharma industry.

With its new intuitive, **21 CFR Part 11** compliant software and hardware improvements, PurePep Sonata+ is easy to operate. The system retains our proprietary valve block system, the PurePep® Pathway. Together with Single-Shot deliveries eliminating the risk of reagent cross-contamination, the system ensures unparalleled purity. Variable mixing modes increase productivity.

## PUREPEP SONATA+ OVERVIEW







Purity  
Productivity  
Power

## ADVANTAGES AT A GLANCE

- Unique real-time flow technology with minimal calibration**  
 No more need for flow calibration of individual reagents saves time. Flow rates are continually monitored and adjusted to ensure accurate and precise volume delivery, even for different viscosities.
- Uncompromized purity**  
 Proprietary, chemically inert valve block system, PurePep Pathway, and Single-Shot™ pre-activation ensure no reagent cross-contamination. Peptides with short and long sequences are synthesized with the highest possible crude purity.
- New, intuitive software**  
 Icon-driven software platform simplifies set-up of peptide synthesis methods. Pre-programmed standard protocols serve as customizable templates for ultimate productivity and flexibility.
- Variable mixing modes for higher reaction efficiency**  
 Nitrogen bubbling, agitation with adjustable speed and recirculation can be used alone or combined to maximize reaction efficiency.

## NEW HARDWARE MAXIMIZES UP-TIME

The new hardware components save time during instrument setup, maximize up-time and reduce the need for maintenance

- Fast and flexible primary solvent pump results in less maintenance
- Easy connections to external primary solvent and waste systems
- Improved recirculation pump for added flexibility

## NEW INTUITIVE WORKFLOW-DRIVEN SOFTWARE

The new icon-driven software platform makes it easy for chemists to set up and run their synthesis and finish it sooner. The software is designed with 21 CFR Part 11 compliance making the instrument ideal for highly regulated cGMP laboratory environments.

- Simple to set up a run by all users from novices to experienced chemists
- Synthesis status updates will keep you in the know – email notification, self-diagnostics, and the option to pause and edit protocols
- Pre-programmed standard protocols or customizable protocols for speed, ease of use and ultimate flexibility
- Cost and usage calculators built-in

# SOFTWARE DESIGNED FOR REGULATORY COMPLIANCE

When used in cGMP facilities to produce peptides, the software of PurePep Chorus, Symphony X and PurePep Sonata+ addresses US Food and Drug Administration (FDA) requirements under Title 21 CFR Part 11, helping users with:

- **User management**, where specific role rights and privileges to predefined user groups are assigned, including Administrator, Designer, Runner, Auditor, Service or Factory. Individual users can be added and assigned individual passwords.
- **Traceability**, where an audit trail is time-stamped, with all system events and modifications detailed and recorded.
- **Data integrity** achieved by synthesis/cleavage programs and sequence files being encrypted and protected by passwords. Synthesis run reports are recorded as digitally signed PDFs. Backups (restore points) are done as part of a backup and recovery strategy to avoid data loss.
- **Electronic signature** with two distinct components: an identification code and a password. The digitally signed synthesis reports contain the user's name, date, time and reason for signing.



## IQ/OQ

Our Installation Qualification and Operation Qualification (IQ/OQ) support services verify and document that your instrument is supplied, installed, and operating according to its specifications. Critical components, system functionality and reproducibility during automated synthesis are inspected and documented to help meet regulatory requirements. Comprehensive support available Installation Qualification and Operation Qualification (IQ/OQ).

IQ/OQ support services verify and document that your instrument is supplied, installed, and operating according to its specifications for operating under cGMP conditions. Our certified field service engineers inspect critical components, system functionality and reproducibility during automated synthesis and provide documentation for regulatory requirements.

## TRAINING

Service and support are available to accelerate and simplify your work. All our synthesizers are supported by the Service team, which also provides appropriate hardware training. Field Application Scientists help with application support, from protocol design to analysis of results.

Signed documentation is provided to record the completion of the IQ and OQ Services or training, to be filed in your Quality Management System (QMS).

## QMS

Signed documentation is provided to record the completion of the IQ and OQ Services or training, to be filed in your Quality Management System (QMS).

# PUREPEP PEPTIDE SYNTHESIS REAGENTS

## AMINO ACIDS

100% fully synthetic amino acids, QC tested.  
Guaranteed weight, purity and identity. Ready to use pre-packed or bulk bottles with high quality amino acids for all our peptide synthesizers. Fmoc protected amino acids are available in bulk quantities from 5g to 1kg or custom sizes are available upon request.



## RESINS

Choose from a variety of high-quality standard and specialty resins, including pre-loaded Wang, Rink, 2-chlorotrityl, and HMPB linkers on polystyrene and Tentagel® supports. Resins are available in 1g, 5g and 25g pack sizes.

## COUPLING REAGENTS

Improve yield and purity with high quality additives and coupling reagents. Minimize side products and optimize chemistry by choosing the right coupling methods. COMU®, DIC, HBTU, HCTU, HDMA, HDMC, K-Oxyma®, OxymaPure®, Py-Oxim®, PyClock® are available in bulk quantities from 5g to 1kg or custom sizes available upon request.



# GYROS PROTEIN Technologies

**For more information:**  
**[peptides@gyrosproteintech.com](mailto:peptides@gyrosproteintech.com)**  
**[www.gyrosproteintechnologies.com](http://www.gyrosproteintechnologies.com)**

Gyros Protein Technologies logo, Intellisynth, Prelude, PS3, PurePep, Single-Shot, Sonata, Symphony and Tribute are trademarks of Gyros Protein Technologies Group.

COMU, OxymaPure, PyClock, K-Oxyma and Py-Oxim are trademarks owned by Luxembourg Bio Technologies Ltd.

All other trademarks are the property of their respective owners. © Gyros Protein Technologies AB 2022.

#### UNITED STATES:

4675 South Coach Drive  
Tucson, AZ 85714, USA  
Phone: 520-629-9626  
Toll Free: 800-477-6834

#### SWEDEN:

Uppsala Science Park  
Dag Hammarskjölds väg 54  
751 83 Uppsala, Sweden  
Phone: +46 (18) 56 63 00