Meeting Advanced Peptide Research Demands

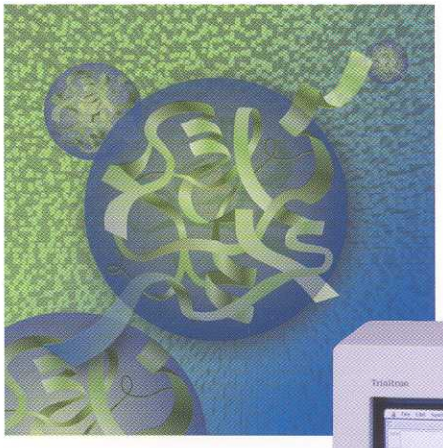
Applied Biosystems

433A

Peptide Synthesis System

The gold standard of peptide synthesis

The 433A peptide synthesizer from Applied Biosystems is the gold standard of performance in peptide synthesis. It offers an extraordinary range of features that provide efficiency, functionality, and versatility. The 433A peptide synthesizer has the largest installed base of any peptide synthesis system because of its proven history of superior performance.



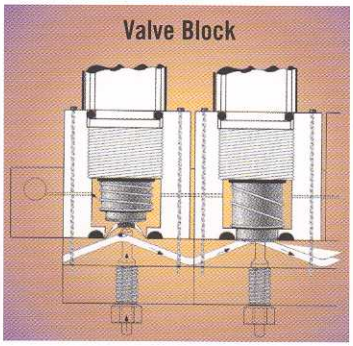
Proven Flexibility

Proven Results

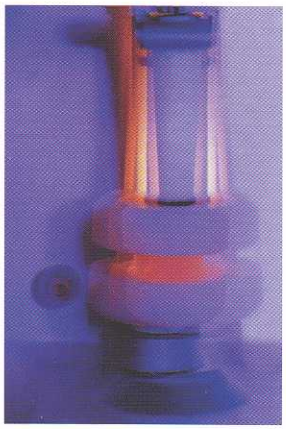
Proven Quality

Proven Performance

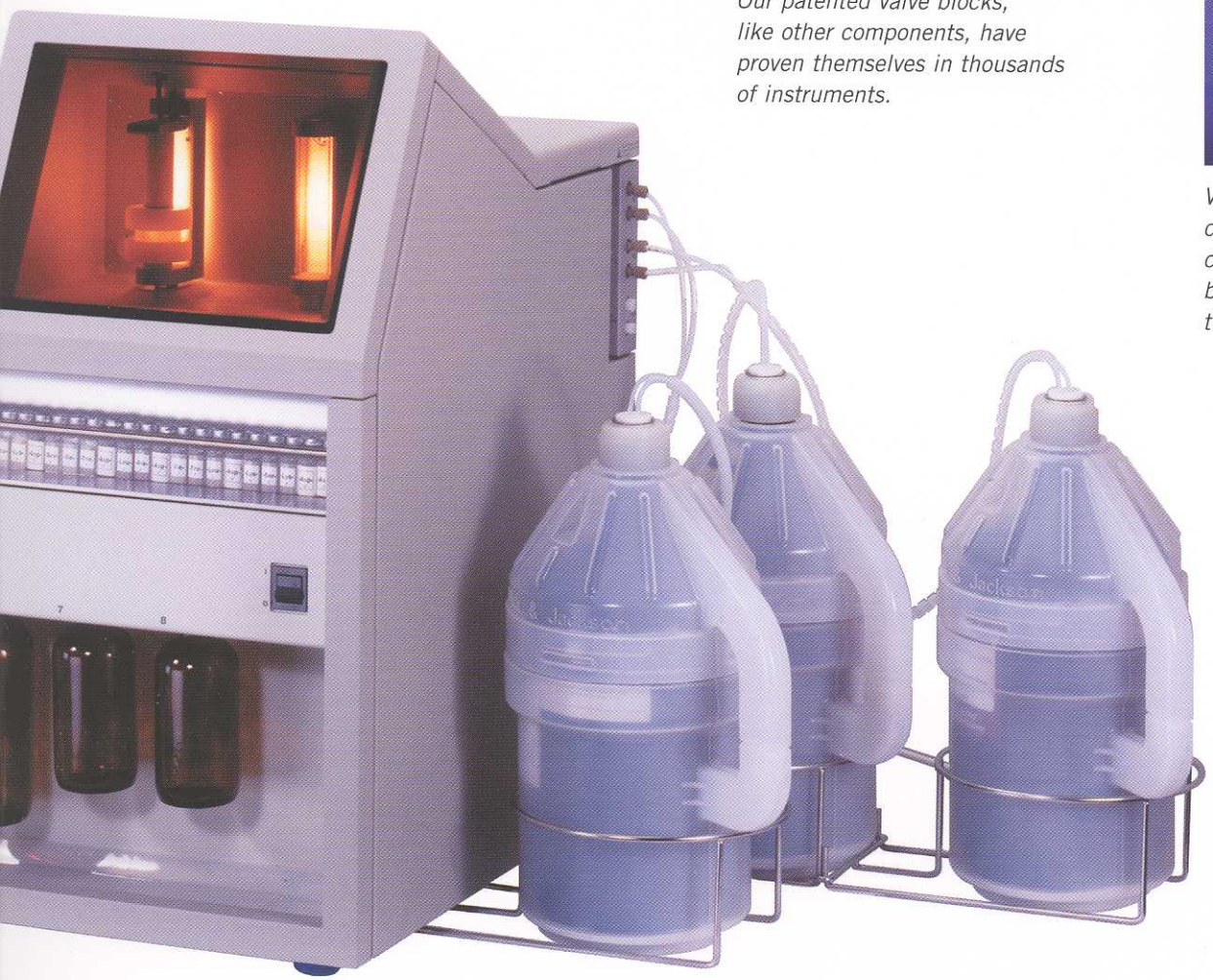
nance



Our patented valve blocks, like other components, have proven themselves in thousands of instruments.



Vortex mixing ensures continuous, highly concentrated interactions between the peptide and the activated amino acid.



Uncompromising chemistries, unrivaled flexibility

Synthesize long and complex peptides

No Compromises

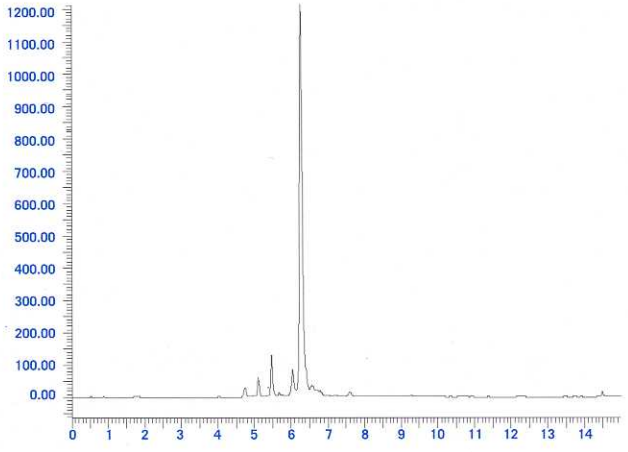
Advanced peptide research demands uncompromising instrumentation and flexible chemistry. With the 433A, you can choose tBoc or Fmoc chemistry—or switch between them. If you need long, complex peptides, or have other special synthesis needs, you can employ a variety of chemistry strategies to obtain optimal results.

Benefits include:

- Wide range of peptide synthesis scales from 0.10 to 1.0 mmoles, and optional scales with the 3-mL reaction vessel of 5, 10, or 20-µmole.
- Separate activation vessel permits any activation strategy—preactivated, or *in situ*—while also saving time. As one residue undergoes coupling in the reaction vessel, the next residue is simultaneously activated. You can use any carbodiimide, uronium or other activator.
- Flexibility to utilize any type of resin.
- Engineering design that accommodates trifluoroacetic acid, a highly corrosive liquid. The 433A valve blocks have proven their reliability in thousands of instruments.
- Capability to synthesize complex or long sequences, e.g. 100-mer peptides.

3mL Reaction Vessel Kit

Lets you perform very small-scale synthesis with the 433A. This smaller reaction vessel accommodates 5, 10, and 20-µmol-scale synthesis. These lower scales let you economically use peptide nucleic acid (PNA) monomers, glycosylated amino acids, and isotopically labeled amino acids.

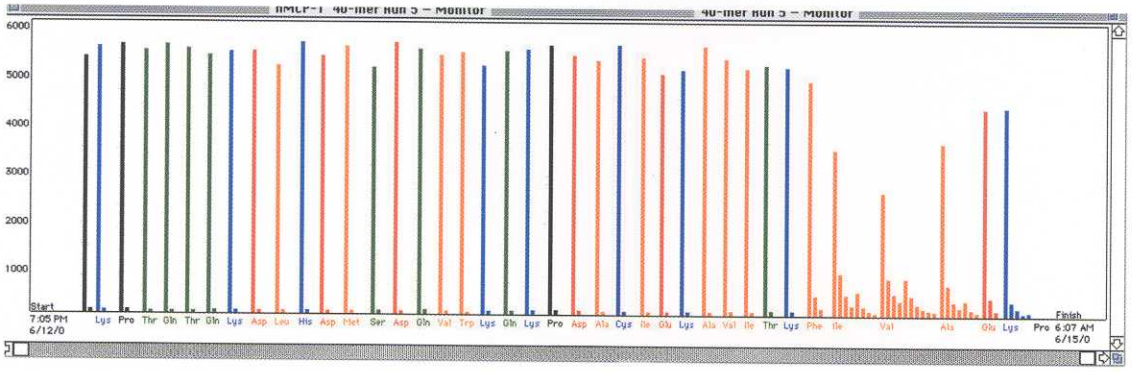


PNA sequence of H-TCA-TAG-ACA-ATT-NH_2 synthesized to 83% purity by integration.

Achieve better syntheses

Faster synthesis, superior peptides

Monitoring with feedback control



Histogram data for a 40-residue peptide synthesizing using feedback control to extend deprotection and coupling for difficult cycles.

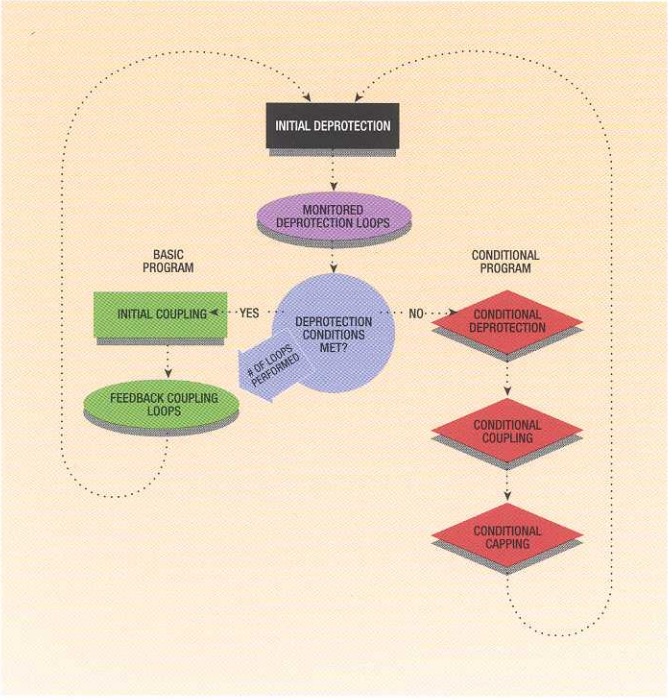
At the heart of the 433A is a unique feedback monitoring system that allows you to create longer, more complex peptides-efficiently. The monitoring system monitors the deprotection reactions and automatically extends the deprotection and coupling in difficult regions. This enables you to improve throughput by programming short cycle times, and rely on the instrument to lengthen a cycle only for difficult couplings. The result: faster synthesis, greater coupling yields, and superior peptides. You save time and reduce reagent waste.

Monitoring choices to meet your needs

Two monitoring programs are available to meet your research and information needs. These programs direct instrument operations based on the information obtained from the 433A monitoring system.

The flow diagram illustrates both programming options. With the basic control program (left side of the diagram) when the deprotection percentage is achieved, the 433A proceeds to initial coupling. The 433A counts the number of monitoring deprotection loops performed to achieve your required deprotection. When the synthesis proceeds to coupling, the 433A performs the same number of feedback coupling loops before advancing to the next cycle.

For more difficult peptides, the conditional capability lets you program the synthesizer to perform more complex operations based on the monitoring data. The conditional program directs the synthesizer to operate according to your instructions—if the deprotection conditions are not met (right side of the diagram). As the diagram shows, additional deprotection can be followed by coupling and capping steps before the system proceeds to the next cycle. You can also develop your own deprotection program. Other choices could include double coupling, changing coupling condition with co-solvents or additives, or stopping the synthesizer.



With conditional programming, you do not have to treat an entire peptide as difficult just because of a few troublesome regions. Instead, you can plan ahead for potentially difficult coupling without having to predict exactly where the problems will occur.

Intuitive programming

The SynthAssist Software and the computer included with the 433A offers powerful programmability and control. This system provides the power to take full advantage of the 433A's innovative feedback control technology. Designed specifically for peptide synthesis, this intuitive software:

- Assists in rapidly setting up every aspect of a run.
- Collects and stores data, including a log of everything that occurs during your synthesis. It stores files for reference, repeat runs or future modifications.
- Analyzes results.
- Calculates coupling yields, molecular weight and amino acids composition.
- Stores information regarding the compounds and reagents you normally use in a dictionary file. You can add more, such as unique amino acids, novel protecting groups and compounds developed in the future.
- Offers chemistry files that are preprogrammed for the full range of synthesis scales, from 0.1 to 1.0 mmole. Run them as is or use them as starting frameworks you can modify to suit your unique needs.
- Allows quick and easy editing of sequences and synthesis files to fine-tune customer runs. You can mix and match functions, steps, modules and cycles to create the exact synthesis run you need.

"Our AB 433A instruments are the firm basis of our peptide synthesis unit. The ease of application, speed and reliability make them especially suited for special syntheses including long and difficult peptides."

Holger Wenschuh, PhD.
Head of Jerini Peptide Technologies
Jerini AG

results

Synthesis of long peptides on the 433A

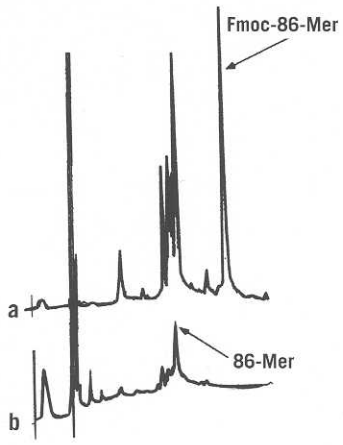
The synthesis of long peptides is of interest because functionally active protein and enzymes are roughly 100 amino acids in length. The stepwise automated synthesis of long peptides, 75–100 amino acids or more, can readily be carried out on the 433A peptide synthesizer.

The preparation of TAT 86-mer, the translational activating protein from the RNA viruses, is shown below.

Fmoc-Met-Glu-Pro-Val-Asp-Pro-Arg-Leu-Glu-Pro-Trp-Lys-His-Pro-Gly-Ser-Gln-Pro-Lys-Thr-Ala-Cys(Acm)-Thr-Thr-Cys(Acm)-Tyr-Cys(Acm)-Lys-Lys-Cys(Acm)-Cys(Acm)-Phe-His-Cys(Acm)-Gln-Val-Cys(Acm)-Phe-Thr-Thr-Lys-Ala-Leu-Gly-Ile-Ser-Tyr-Gly-Arg-Lys-Lys-Arg-Arg-Gln-Arg-Arg-Arg-Pro-Pro-Gln-Gly-Ser-Gln-Thr-His-Gln-Val-Ser-Leu-Ser-Lys-Gln-Pro-Thr-Ser-Gln-Pro-Arg-Gly-Asp-Pro-Thr-Gly-Pro-Lys-Glu-OH

The 86-mer TAT sequence. The seven cysteine residues in the sequence were incorporated as the Acm derivative for both synthesis and analysis.

The synthesis of the TAT 86-mer was carried out on the 433A using standard reagent for *FastMoc* chemistry, UV monitoring of the Fmoc deprotections, and conditional chemistry run files. The conditional chemistry files automatically extended deprotections, extended couplings, and then capped each cycle whenever the deprotections failed to reach a baseline level rapidly.



HPLC results of the Fmoc protected (a) and the unprotected (b) 86-mer TAT sequence product.

"If you want the best peptide synthesizer for large peptides, there is no doubt that the 433A is the choice."

David Schooley
Professor of Biochemistry and Director of the Protein Microanalysis and Mass Spectrometry Facilities
University of Nevada

from our lab to yours

Dependable and collaborative support

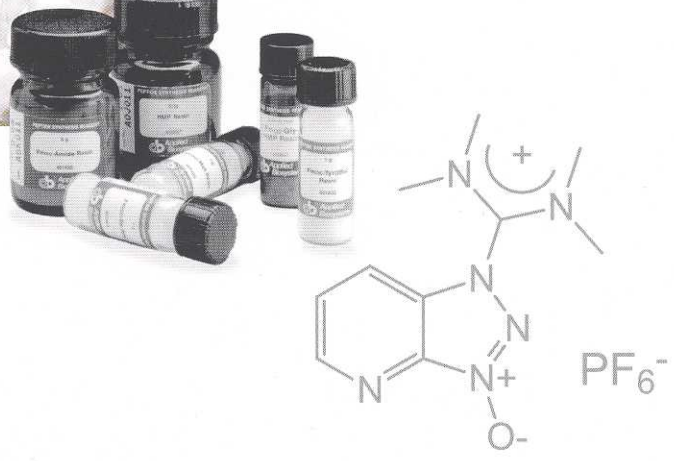
Applied Biosystems has been a leader in peptide synthesis for two decades. We continue to provide technical innovation, reliable instrumentation, and ongoing application development to make it easy for you to synthesize the high-quality peptides you need.

Service, technical support and field applications

We are committed to helping our customers break new ground. Our service ensures the smooth day-to-day operation of your system. We provide strong application and technical knowledge, resulting in unequalled customer support.

Chemistry

We are dedicated to providing innovative technologies and products. We are leaders in the development of novel technologies, such as PEG-PS™ solid support, and high performance activation agents. We have strict quality control and pay close, careful attention to manufacturing processes to produce high-quality reagents.



"Applied Biosystems technical support has been top-notch."

Robin Daskin
Scientist II
Genencor International

Worldwide Sales Offices
Applied Biosystems vast distribution and service network, composed of highly trained support and applications personnel, reaches into 150 countries on six continents. For international office locations, please call the division headquarters or refer to our Web site at **www.appliedbiosystems.com.**

Applera Corporation is committed to providing the world's leading technology and information for life scientists. Applera Corporation consists of the Applied Biosystems and Celera Genomics businesses.

Headquarters
850 Lincoln Centre Drive
Foster City, CA 94404 USA
Phone: 650.638.5800
Toll Free: 800.345.5224
Fax: 650.638.5884

For Research Use Only.
Not for use in diagnostic procedures.

Printed in the USA. 7/2002, BHL.
Publication 118BR01-01

Applied Biosystems