

Instrument Specifications

Synthesis Scale	0.05 – 5 mmol
Reaction Vessel Sizes	30 and 125 mL Standard
Chemistry	Fmoc or t-Boc (no HF cleavage)
Activation Method	In situ, standard activators
Amino Acid Reagents	25 (125 or 250 mL each)
External Bottle Positions	7 (up to 12 depending on configuration)
Temperature Sensor	<i>In situ</i> Fiber-optic
Fluid Measurement	Variable size sample loop - Amino Acids, Activator, Activator Base, Cleavage Timed Delivery - Main wash, Secondary Wash, Deprotection, Capping, *Cleavage (*for Boc synthesis)
Reagent Transfer	Nitrogen or Argon pressure
Agitation	Programmable inert gas bubbling
Cleavage	Optional automated cleavage with isolated fluid path
Waste Container	20L reservoir with overflow detection
Controller	User selectable desktop of laptop with wireless option standard
Reports	Printable .pdf file for each method created. Log created during each run of every step performed.
Power	120V/60Hz or 240V/50Hz
Dimensions	26.5"W x 20.5"D x 33"H (67cm x 52 cm x 84 cm)
Warranty	1-year parts and labor
Patents	US Patents 6648659, 6666223, 5459302, 6607920B2 with other US & Worldwide patents pending

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Liberty

Microwave Peptide Synthesis



Shortest Cycle Times
Highest Purities
Access to Longer Peptides
Difficult Couplings made Easy

CEM

Accelerating the Transformation of Concept to Cure

The world's first and only automated Microwave Peptide Synthesizer!



"The implementation of microwave assisted peptide synthesis was the most important change in our chemistry in the last several years. It enables us to do even difficult sequences in high purity faster than ever before."

Andreas Rybka, PhD
Research Scientist
AplaGen GmbH

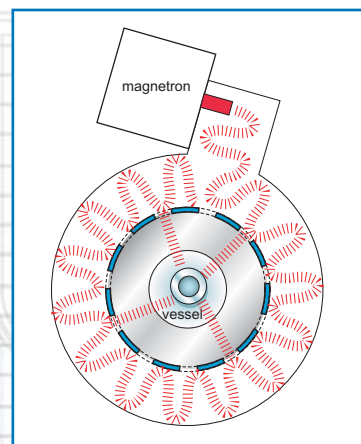


The Liberty Advantage

- Fastest cycle times available
- Greater purity peptides than conventional synthesis
- Access peptides impossible to synthesize under conventional conditions
- Totally automated synthesis of up to 12 peptides
- Bench-top unit

Make higher purity peptides faster. Microwave energy drives biochemical reactions to completion up to 10 times faster than by conventional methods, resulting in peptides of greater purity than can be produced under conventional methods. Reactions are not just faster; they are more complete when driven by microwave energy. Liberty's unique utilization of microwave energy gives biochemists and other researchers active in the study of proteins the unprecedented ability to synthesize peptides that were previously inaccessible by conventional synthetic methods. However, the Liberty is more than a research platform. The system is capable of synthesizing up to 12 peptides in a day unattended at scales up to 5 mmol, Liberty's unique combination of speed and productivity. No other technology can equal this kind of productivity.

The system's superior performance is due to the innovative design of its patented, circular cavity. Liberty utilizes a single-mode cavity that "focuses" a homogenous microwave energy field on the sample, ensuring that the sample always receives the optimum amount of energy to drive the reaction. An integrated fiber optic temperature probe provides true in-situ measurement. Liberty's temperature monitoring capability controls the power output, ensuring faster reactions, higher yields and improved purity.

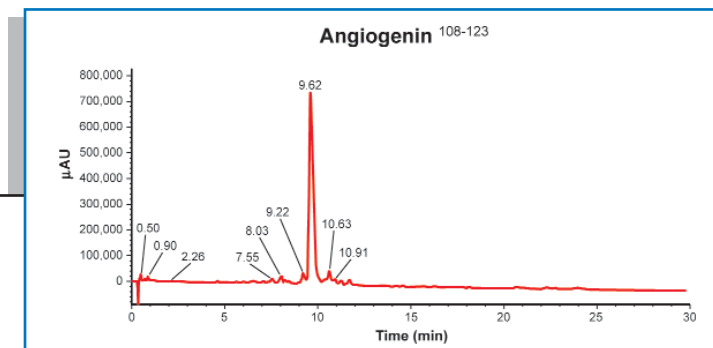


Flexible

- Wide scale range of 0.1 to 5 mmol
- Use up to 25 amino acid reservoirs
- Programmable cleavage & automated resin addition
- Use either 125- or 250-mL amino acid bottles

Liberty is available as a completely automated system with a scale range of 0.1 to 5 mmol. These external ports can be used for adding extra amino acid solutions, activators, solvents, or any user-defined reagent needed, giving users the cost-effectiveness and flexibility of multiple peptide production at an individually programmed scale.

Liberty completely controls each reaction step in the process. The patent-pending process uses microwave energy at moderate temperatures to shorten reaction times. Liberty's temperature control and shortened reaction times translate into a reduction in racemization. Microwave energy drives the reaction steps so quickly that product racemization is virtually eliminated.^{1,2}



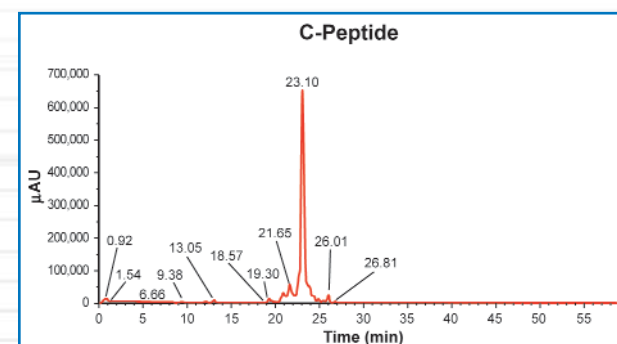
Angiogenin
Sequence: ENGLPVHLDQSIFRRP
Liberty Method

Scale = 0.25mmol
Resin = Pro-Chlorotrityl, 0.61 meq/g (Anaspec)

Deprotection	20% Piperidine / DMF	3 min
Coupling	HBTU/DIEA 0.9/2 , x4 excess	2 min
Cleavage	TFA/TIS/H ₂ O 95/2.5/2.5 (v/v)	18 min

"Using the Liberty, I was able to make an extremely difficult peptide that I simply could not make with conventional Fmoc/HBTU chemistry."

Haydn Ball, Ph.D.
Associate Director
Protein Chemistry Technology Center
The University of Texas Southwestern Medical Center at Dallas



C-Peptide
Sequence: EAEDLQVGQVELGGGPGAGSLQPLALEGSLG
Liberty Method

Scale = 0.25 mmol
Resin = F-moc-Gly-Wang, 0.6 meq/g (Novabiochem)

Deprotection	20% Piperidine / DMF	3 min
Coupling	PyBoP/DIEA 0.9/2 , x6 excess	4 min
Cleavage	TFA/TIS/H ₂ O/EDT 94/1/2.5/2.5	18 min

- 1 Lahm, H.W.; Lergier, W.; Manneberg, M.; Knorr, R. *Protein Chem.* 1988, 7, 258.
- 2 Chen, S.T.; Chiou, S.H.; Wang, K.T. *J. Chin. Chem. Soc.* 1991.



Fmoc Amino Acids
Preweighed or Bulk

CEM offers a complete line of amino acids available both preweighed and in bulk. The preweighed amino acids come in packs of 4 bearing an individual lot analysis. The chemist merely adds a specific amount of solvent to the bottle and screws the bottle into the proper location on the Liberty. For the complete listing go to

<http://www.cem.com/lifescience/reagents.asp>

