biopharma technology llc

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3-Day Lyophilization Technology Workshop: Product, Process & Systems

A practical guide to lyophilization science, product characterization, cycle development and scale-up

September 29th – October 1st, 2026
UMass Lowell, Lowell, MA

3-Day Practical Training | Expert-Led Workshops | Certificate of Completion

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About the workshop

This 3-day workshop gives participants a practical and structured overview of the lyophilization process, from product characterization and formulation considerations through to cycle development, scale-up and freeze-dryer systems.

Led by experts in the field of lyophilization and hosted at UMass Lowell, the course covers the science, best practices and engineering behind freeze drying. Through a combination of theoretical sessions and practical workshops, participants will explore how these principles can be applied to real-life lyo cycle and development questions.

What you'll learn:

- Understand the science and best practices behind the lyophilization process
- Explore product characterization methods used before lyophilization cycle development
- Review formulation design strategies for stable lyophilized products
- Understand freezing, primary drying and secondary drying principles
- Learn key considerations for cycle development, loading and scale-up
- Explore process monitoring, PAT, QbD and software-based development approaches
- Understand refrigeration, vacuum, stoppering and process condenser systems
- Evaluate lyophile appearance, product analysis, maintenance and troubleshooting considerations

Why this course?

- Taught by Dr Kevin Ward and Andrew Ray – Kevin is Biopharma Group's Director of R&D and has worked in lyophilization since 1993. Andrew is Engineering Manager, specialising in freeze dryer service, repair, installation, validation and engineering training.
- Small group format with direct access to expert instruction
- Combines lyophilization science, best practice and engineering knowledge
- Covers product, process and freeze-dryer system considerations
- Includes practical workshops and multidisciplinary group exercises
- Applies learning to real-life lyo cycle and development questions
- Certificate of completion provided upon successful completion

Who should attend?

- Professionals working in pharma, biopharma, diagnostics, medical and biotechnology settings
- Scientists and engineers using lyophilization from R&D through to manufacturing
- R&D and formulation scientists developing or supporting lyophilized products
- Lab managers and technicians involved in freeze-drying processes and analysis
- Production operatives supporting lyophilization in manufacturing environments
- Engineers and technical support teams working with freeze-dryer systems
- Quality assurance teams supporting product quality and process control
- Anyone seeking a broader understanding of product, process and system considerations

Course schedule highlights

DAY 1

Introduction to lyophilization process, features and equipment

Product freezing and controlled nucleation

Refrigeration and thermal transfer systems

Primary and secondary drying principles

Stoppering systems, formulation and process condensers

DAY 2

Formulation characterization before lyophilization

Vacuum systems and leak detection

Cycle development and scale-up

Process monitoring, PAT and QbD approaches

Workshop session: evaluating lyophile appearance

DAY 3

Containers, closures and barrier technologies

Product analysis, moisture content and stability

Appearance, structure, mechanical properties and DVS

Cleaning, sterilization, maintenance and troubleshooting

Workshop session: designing your own lyophilizer

About our instructors

Dr. Kevin Ward
Director of R&D

Biopharma Group's Director of R&D, Dr. Kevin Ward, is globally recognised as a lyophilization expert and has been actively working in the field of lyo technology since 1993, joining Biopharma Group in 2000. He's been involved numerous academic research projects and, together with his team, has worked on over 5,000 projects for customers worldwide. Kevin received his PhD for investigations into the freeze-drying of pharmaceutical formulations and drug/vaccine delivery systems.

Prior to joining the team, Kevin worked at Pfizer Central Research and as a Research Fellow in vaccine development at Aston University. Whilst working at Biopharma Group, Dr. Ward has become an editor and a contributing author of articles and texts on freeze drying, including the Springer book "Lyophilization of Pharmaceuticals and Biologicals". He is also in demand as a frequent lecturer to many of the leading regulatory agencies and prominent pharma companies.

Andrew Ray
Engineering Manager

Andrew has been part of Biopharma Group's Engineering Department for five years, specialising in the service, repair and installation of freeze-dryers and analytical instruments. In recent years, his breadth of experience and technical expertise have seen him promoted to Engineering Manager, with his role expanding to include equipment validation and engineering training.

Before joining Biopharma Group, Andrew served in the Royal Navy Submarine Service and spent two decades in the oil and gas sector, gaining significant technical and training experience.

Course agenda

Agenda Day 1 – September 29th 2026, 08:30 – 16:30
Session title
Welcome and course introduction
Introduction to lyophilization: process, features and equipment
Refreshment Break
Product freezing: ice crystals, solutes and controlled nucleation
Refrigeration and thermal transfer systems
Lunch Break
Primary and secondary drying: sublimation and desorption
Stoppering systems: requirements and alternative designs
Refreshment Break
Formulation for lyophilization: design issues and strategies
Process condensers: protecting product and vacuum systems

Agenda Day 2 – September 30th 2026, 08:30 – 16:30
Session title
Formulation characterization before lyophilization
Vacuum systems: pumps, pressure gauges and leak detection
Refreshment Break
Cycle development and scale-up
Lunch Break
Process monitoring: temperature measurement and PAT
Alternative approaches to cycle development: software and QbD
Refreshment Break
Workshop session: evaluating lyophile appearance

Agenda Day 3 – October 1st 2026, 08:30 – 15:15
Session title
Containers, closures and barrier technologies
Product analysis part 1: moisture content and stability
Refreshment Break
Cleaning and sterilization of freeze-dryers
Product analysis part 2: appearance, structure and mechanics
Lunch Break
Maintenance and troubleshooting
Product analysis part 3: DVS techniques
Workshop session: designing your own lyophilizer

Logistics & enrollment

Course location:

UMass Lowell North Campus

SAAB Emerging Technology & Innovation Centre (ETIC)
40 University Avenue
Lowell, MA 01854

Date:

September 29th – October 1st, 2026

Availability:

Spaces are limited, register early to secure your place

Inclusions:

Morning and afternoon breaks, lunch and full lecture notes
Certificate awarded upon successful completion

Accommodation:

Accommodation is not included in the course fee. Room bookings must be made directly by attendees. A list of local hotels will be provided within the delegate information upon registration confirmation.

Cost:

$4,350 Early bird rate **$3,995** until August 28th, 2026

Payment options:

Card payment via Stripe or proforma invoice.
Looking to book for a group? Contact Kari Roberts via +1 (858)-952-2018 or kroberts@btllc.solutions for group discount rates and options.

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