

## Freeze drying experts Biopharma present a practical course in lyo cycle development at small & pilot scale

This three-day workshop will provide an in-depth practical experience into how to approach the development of a lyophilisation cycle.

The course covers the relevance of product knowledge and how formulations are characterised to reveal their critical parameters. This practical stage will illustrate the significance of developing an appropriate formulation for successful cycle development. It will take into account the various goals that may be applicable to a product, for example stability, shelf-life, porosity and reconstitution.

The development of the cycle is explored, emphasising the importance of an optimised cycle for robustness, a streamlined regulatory pathway and maximised operational and financial efficiency.

## Course Benefits

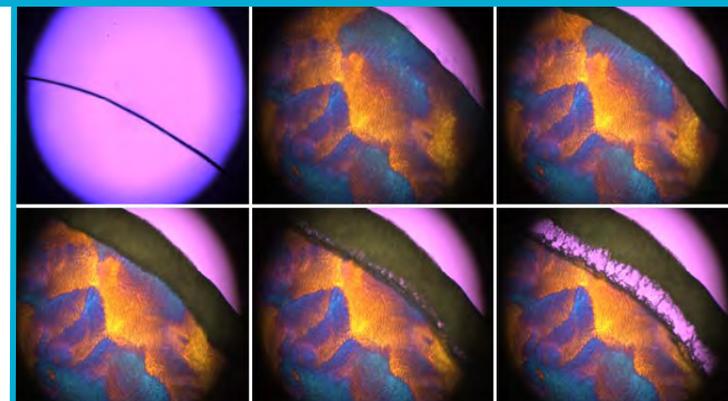
This unique course combines classroom teaching with practice in our laboratory. Delegates will gain in-depth understanding of the science of freeze drying and the principles of product and process development, both theoretical and hands-on.

### Learn:

- **Different techniques** of formulation analysis
- How to **develop and optimise** a freeze drying cycle
- How to **program a freeze-dryer**
- What can go wrong and **how to troubleshoot**
- How to tell if your cycle was successful—**post-process characterisation**

## Who should Attend :

Personnel in biotechnology, pharmaceutical, biomedical engineering, diagnostics and food industries, involved in freeze drying formulation and cycle development and scale-up, including **Formulation Scientists, Process Technicians, Microbiologists, Chemists** and **Pharmacists**.



## About Biopharma

Biopharma has provided specialist services in freeze drying since 1989, adding the independent analysis, development and consulting division of BTL in 1997. We have worked with hundreds of product types, from small drug molecules to large complex biomolecules, cells, tissues and even some more unusual products such as archaeological artefacts. As well as R&D, consultancy and training, we also worked to develop analytical instruments that would provide additional in-depth information for product and process development: the Lyostat freeze drying microscope and Lyotherm frozen state analyser. We continually participate in research to further the science and our understanding of freeze drying, with projects including red blood cells, collagen scaffolds and probiotics.

### Thomas Peacock MSc

After an MSc in Pharmaceutical Analysis Tom specialised in the field of lyophilisation. Tom has managed many commercial freeze-drying projects typically involving formulation development and characterisation, looking at key product factors and



designing robust and efficient cycles. Tom has significant expertise in freeze drying microscopy and has travelled widely lecturing on freeze drying.

### Dr Kevin Ward

Kevin was awarded his PhD for studies in pharmaceutical freeze-drying, focusing on the use of protective agents in formulations of proteins and liposomes for drug and vaccine delivery. He has worked in the pharmaceutical industry and as a research fellow in vaccine development. Kevin is R&D Director at BTL and regularly lectures on the freeze drying process as well as analytical and process related issues.



## Venue

The course is held at our facility in Winchester in the south of England, conveniently close to many transport hubs including London international airports. It features hands-on time in our own freeze drying laboratory, using the same equipment and techniques that we use in our consultancy and research work. A list of local recommended hotels will be sent with the delegate packs for attendees to make their own reservations.

### Biopharma House

Winnall Valley Road, Winchester SO23 0LD, UK  
+44 (0)1962 841092, [btl@biopharma.co.uk](mailto:btl@biopharma.co.uk),  
[www.intelligentfreeze drying.com](http://www.intelligentfreeze drying.com)



# Timetable

Classroom session	Laboratory session
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	Day 1	Day 2	Day 3
AM	Course introduction and Introduction to freeze drying: characterisation methods and the stages of freeze drying	Theory of cycle development SMART & ControLyo technology	Programming secondary drying
		Preparation for freeze drying: filling and stoppering vials, loading and programming a freeze dryer	Troubleshooting workshop: What goes wrong and how to identify and resolve issues
<b>Lunch</b>			
PM	Characterisation techniques: freeze drying microscopy, DTA/impedance analysis, mDSC; visual assessment of freeze dried product	Secondary drying and PAT	Post-processing characterisation: theory and techniques
		Observation of 2 cycles in progress (the students' and the lecturers')	End of students' cycle. Post process-characterisation techniques including Karl Fisher and mDSC
	Discussion of analysis results and conclusions	Conclusions and discussions from day's results	Conclusions and course summary

Timetable shown is representative and may be subject to change.

# Course details and booking form

Name		
Job Title		
Organisation		
Address		
Invoice Address (if different)		
Phone		
Fax		
Email		
Please reserve		places

Fax to: +44 1962 841147 Email to: [bt1@biopharma.co.uk](mailto:bt1@biopharma.co.uk) or book online at [www.biopharma.co.uk/training-courses/](http://www.biopharma.co.uk/training-courses/)

**Date:** 14th-16th June 2016

**Location:** Biopharma House, Winnall Valley Road, Winchester, SO23 0LD, UK. +44 (0)1962 841092

**Standard Fee: £1520**

**Early Bird Rate: £1355** - Rate available when registration & payment is made by 2nd May 2016

Discounts also available for group booking and academia. Contact Sally Potentier for more information: [spotentier@biopharma.co.uk](mailto:spotentier@biopharma.co.uk), +44 (0)1962 841092.

Please note that the cost of accommodation is not included in the course fee and that bedroom bookings must be made by the participants. A list of recommended local hotels will be provided with the delegate information. Fees include morning and afternoon breaks, lunch and full lecture notes. Other course types and locations are also available — see

[biopharma.co.uk/training-courses](http://biopharma.co.uk/training-courses) for more details.

Payment must be made in full before the start of the course to guarantee a place. Payment by BACS or credit/debit card is acceptable—please note we cannot accept payment by check. An invoice will be issued on receipt of booking. Payments in credit/debit card will be charged in GBP. An invoice will be issued on receipt of booking.

Discounts are also available for academia and multiple bookings from the same company, please contact us for details.

Cancellation in writing more than 5 weeks before the course start date will incur a service charge of 30% of the applicable fee. No refunds can be made for cancellation after this date. Substitutes will be accepted at any time. Transfer to another scheduled course must be made in writing and a service charge will be incurred.

Full T&Cs available on request.



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