Solving the Lyo Cycle, 28th - 29th October 2026 Carlsbad (CA), USA

DAY 1 - Wednesday 28 October	Session	Presenter	Company
09:00 - 09:30	**Arrival & Refreshments**		
Session 1 - Machine Learning (ML) and Design of Experiments (DoE)			
09:30 - 10:10	**The Use of AI and Machine Learning in Cycle Development Lyo Cycle Design** • Current state of 'Off the Shelf' machine learning agents in lyo cycle design • Leveraging 30 years of Biopharma Group's in-house data to build a bespoke AI assistant (LyoML) • Comparing LyoML with generic AI models: strengths, limitations, and use cases	Sam Woodyard	Biopharma Group
10:10 - 10:35	**Design of Experiments for Lyobead Formulation Development** • The power of DoE for formulation development • Metrics for lyobeads and shift in focus from typical lyophiles • Case study: DoE for a medical diagnostic lyobead product	Dr. Kevin Ward	
10:35 - 11:00	**Machine Learning Powered Collapse Detection Through Image Recognition** • Critical temperature detemination using FDM as a fundamental starting point for cycle design • Limitations of current software used for collapse detection and critical temperature analysis • Development of an AI-driven image recognition model for automated critical temperature	Sam Woodyard	
11:00 - 11:30	**Coffee Break**		
11:30 - 12:15	**Lyophilization in Syringes: An Integrated Approach to Cycle Development and Manufacturing** **Abstract:** This presentation explores how syringe configuration influences heat transfer and cycle development, then broadens the discussion to the interconnected product, process, equipment, and analytical considerations required for successful implementation. Practical examples illustrate how decisions made throughout development can affect manufacturability and product performance. Together, these considerations provide a framework for developing a robust lyophilized syringe product from cycle design through manufacturing.	Brandy Searcy	Ionis
12:15 - 13:30	**Lunch Break**		
Session 2 - Lyo Strategy, Cartridge Design & Lab Tours			
	Navigating On-Board Reagent Integration & Lyophilization Strategies		

13:30 - 14:15	**Abstract:** This discussion will explore key considerations for integrating reagents directly into diagnostic consumables, with an emphasis on lyophilization as a strategy for improving reagent stability, simplifying workflows, and enabling room-temperature storage. We will review practical approaches to reagent formulation, lyophilization, on-board storage and rehydration, while highlighting common development challenges and design considerations for successfully integrating lyophilized reagents into manufacturable consumable formats.	Jacob Hirsch	Arete Biosciences
14:15 - 14:30	**Transit from Open Biopharma site to Lab Tours**		
14:30 - 15:15	Lab Tour: **Group 1 = BTLLC Lab Tour** **Group 2 = Arete Biosciences Lab Tour**	ALL	
15:15 - 16:00	Lab Tour: **Group 1 = Arete Biosciences Lab Tour** **Group 2 = BTLLC Lab Tour**	ALL	
16:00 - Onward	**"BBQ & Beer"**	ALL	

DAY 2 - Thursday 29 October	Session	Presenter	Company
09:00 - 09:15	**Arrival & Refreshments**		
Session 3 - Lyophilization of Reagents and Water Activity: Joining the Dots using Complementary Methods			
09:15 - 10:15	**Lyophilization of Nucleic Acid Extraction Reagents** **Abstract:** The next-generation Grifols molecular diagnostics platform aims to implement room temperature reagent storage and increase multiplexing capabilities. To support this goal, a universal workflow was developed to evaluate magnetic bead-based nucleic acid extraction chemistries for recovery of viral targets across diverse sample matrices. Candidate chemistries were assessed for extraction efficiency, automation compatibility, stability, and integration into a simplified workflow. Lead chemistries demonstrated robust performance and were advanced for platform development. This approach has the potential to improve workflow efficiency, reduce environmental impact, and support highly multiplexed molecular testing.	Bryan Leatham	Grifols
10:15 - 10:45	**Coffee Break**		
	Humidity-Induced Collapse in Freeze Dried Cakes by Dynamic Vapor Sorption		

10:45 - 11:45	**Abstract:** The interaction of freeze-dried materials with residual water can be critical in determining their activity / potency and long term stability. Dynamic Vapor Sorption (DVS) experiments provide an insight into the kinetics and extent of moisture sorption and desorption in lyophilized materials, which can feed back into formulation design, primary packaging selection, lyo cycle development, and aspects of post-lyo handling. This presentation will highlight some of the issues encountered for lyo products in these respects and present some real-life case studies to demonstrate the scientific and practical value of DVS as a technique. • What can DVS tell us about product-water interactions? • The use of DVS to quantify container permeability	Sean Seefeld	Surface Measurement Systems
	• Taking detail to the next level by coupling DVS with LF-NMR		
11:45 - 12:15	**Non-destructive Measurement of Headspace Moisture Using Frequency Modulation Spectroscopy (FMS)** • Rapid generation of data for 100% batch inspection • Using DVS to establish the true meaning of HSM • Water activity: helping end-users comply with USP<922>	Derek Duncan	Lighthouse Instruments Inc.
12:15 - 12:45	**Case Studies in Understanding Moisture for Pharmaceutical, Biological and Diagnostic Products** • Why do different methods give me different results? • Effects of formulation ingredients and process conditions • Seeing past the artefacts to reveal the true picture	Kevin Ward	Biopharma Group
12:45 - 13:15	**Panel Discussion and Q&A Session on Residual Moisture**	ALL	
13:15 - 14:15	**Lunch Break**		
14:15 - 14:30	**Final Questions & Closure**	ALL	