7th IABS Statistics Workshop

Accelerating Drug Development: How QbD, Regulatory Partnerships, and Pandemic Learning Can Further Expedite Meeting Patient Needs

November 8-11, 2021
Virtual Meeting

The pharmaceutical industry, academicians, and global regulators have demonstrated over the past year that drug development can be incredibly accelerated to address urgent, unmet needs. In addition, coupled with that acceleration, the pharmaceutical industry has been on a Quality by Design (QbD) implementation journey for nearly two decades. Acceleration has placed an emphasis on conducting and documenting risk assessments, utilizing modeling to leverage platform knowledge, incorporating digital and technological advances to improve process performance and understanding, and continued refinement and improvement of the information that is submitted to global regulators. What have we learned from these experiences, particularly from the vantage point of CMC statisticians, and what aspects of the near-term dramatic acceleration and longer-term development journey could/should be continued going forward? This workshop will explore the development journeys over a series of sessions by hearing directly from the industry, professors, and global regulators. By focusing each session on themes that cover QbD, Regulatory, Continuous Manufacturing, and Case Studies, the workshop will be an opportunity to help shape the future of drug development through the role of CMC statisticians. Join us for presentations, panel discussions, and breakout sessions to engage directly with speakers, other experts, and each other.

Scientific / Organizing Committee

Kristi **GRIFFITHS**, Co-Chair, Eli Lilly and Company
Stan **ALTAN**, Janssen
Timo **BAILER**, Boehringer-Ingelheim
Rick **BURDICK**, Burdick Consulting
Catherine **CHENG**, Novartis Gene Therapies
JoAnn **COLEMAN**, Spark Therapeutics
Katherine **GIACOLETTI**, Merck & Co., Inc.
Theodoro **KOULIS**, Genentech
Ruojia **LI,** Bristol-Myers Squibb
Tsai-Lien **LIN,** FDA/CBER
Julia **O'NEILL**, Co-Chair, Moderna
Jia **LIU,** Pfizer
Areti **MANOLA**, Janssen
Chuck **MILLER**, Merck & Co., Inc.
Guillermo **MIRO-QUESADA,** AstraZeneca
Laura **PACK,** Rezolute, Inc.
José **RAMIREZ,** Amgen Inc.
Tara **SCHERDER**, Synolostats, LLC
Tim **SCHOFIELD**, IABS, CMC Sciences, LLC
Meiyu **SHEN,** FDA/CDER

DAY 1 – MONDAY, NOVEMBER 8, 2021

10:00am* Introduction to IABS
Tim SCHOFIELD, IABS

Welcome and Introduction to the 7th Annual IABS Statistics Workshop
Kristi GRIFFITHS, Eli Lilly & Company; Julia O'NEILL, Moderna

10:10am **Keynote Address**
Making A Difference in the Biopharmaceutical Development Journey: A CMC Perspective
Diane I. BLUMENTHAL, MSE, President, Dianthus Biopharma Consulting, LLC

Session I *Prior knowledge as a means to further QbD implementation*

QbD has significantly changed drug development practices throughout the industry through, e.g., widespread use of systematic risk assessment, implementation of quantitative tools and scientifically based identification of CQAs and CPPs. There are a few aspects that could still benefit from extended use of QbD principles, including, specification setting, shelf-life assignment, analytical comparability and validation practices. This session will study approaches to further the application of QbD thinking for biologicals in these areas, mainly through the use of prior knowledge.

Chairpersons: **Jia LIU, Pfizer; Guillermo MIRO-QUESADA, AstraZeneca**

10:40am **Session Introduction**
Guillermo MIRO-QUESADA, AstraZeneca

10:45am Leveraging Prior Knowledge to Determine Shelf-Life Limits: A Bayesian Approach to Modeling Stability Data
José RAMIREZ and Barbara RELLAHAN, Amgen Inc. and Fang CHEN, SAS Institute Inc.

11:15am Benefits of Bayesian Inference for QbD
John PETERSON, PDQ Research & Consulting

11:45am **Break**

12:00pm **Parallel Breakout Sessions**
#1 – Prior knowledge as a means to further QbD implementation
Facilitated by Ruojia LI, Bristol-Myers Squibb
#2 – Opportunities for Working with Big Data in Biologicals
Facilitated by JoAnn COLEMAN, Spark Therapeutics

12:40pm Analysis of Multiple Historical Data for Bayesian Prediction on Biologics Analytical Comparability
Qianqiu (Jenny) LI, J&J

1:10pm **Panel Discussion**
Facilitator: Ruojia LI
Panelists: José RAMIREZ, Barbara RELLAHAN, Fang CHEN, John PETERSON, Qianqiu (Jenny) LI, Diane BLUMENTHAL

2:10pm **End of Day 1**

*** Times are Eastern Standard Time**

DAY 2 – TUESDAY, NOVEMBER 9, 2021

Session II *CMC Statistics Advancement in a Regulated Industry*

CMC statistics are used across regulatory filings to advance process development, accelerate product development, and address complex challenges. This session will discuss CMC statistics opportunities and regulatory agencies' thinking on how these can be used to accelerate drug development, including what information is required to support novel statistical approaches that rely more heavily on prior knowledge than ever before. We will discuss agency work to adapt to industry innovation, regulators' perspectives on recent acceleration efforts, and what might be needed to reinforce continued use of useful CMC statistics approaches.

Chairpersons: **Meiyu SHEN, FDA/CDER; Tsai-Lien LIN, FDA/CBER**

10:00am **Session Introduction**
Meiyu SHEN, FDA/CDER

10:05am Drug Product Quality for Patient Benefit: Developing Critical Knowledge Using Systems Thinking
Arzu SELEN, FDA/CDER/OPQ/OTR

10:35am The EMA Reflection paper on statistical methodology for the comparative assessment of quality attributes in drug development
Andreas BRANDT, BfarM, Germany

11:05am **Break**

11:20am **Parallel Breakout Sessions**
#1 – CMC Statistics Advancement in a Regulated Industry
Facilitated by Laura PACK, Rezolute, Inc.
#2 – Patient-Centric Specifications
Facilitated by Tim SCHOFIELD, IABS, CMC Sciences, LLC

12:00pm Bayesian methods in CMC – has the time come for a regulatory guidance?
Paul FAYA, Eli Lilly and Company

12:30pm **Panel Discussion**
Facilitator: Laura PACK
Panelists: Arzu SELEN, Andreas BRANDT, Paul FAYA, Dave LEBLOND

1:30pm **End of Day 2**

DAY 3 – WEDNESDAY, NOVEMBER 10, 2021

Session III *Current trends and Issues in Continuous Manufacture Driving Drug Development*

The pharmaceutical industry is at the cusp of a manufacturing revolution as Continuous Manufacture (CM) technology is embraced by more and more companies. The impetus for this transformation is being driven by both regulatory encouragement as well as commercial interests. It promises higher quality, quicker development time, less environmental impact, smaller facilities, and a faster more agile response to market conditions among others and can be viewed fundamentally as a Quality by Design approach to development. This promise is brought about through Process Analytical Technology (PAT) enabling Real Time Release testing (RTRt). In this session, we explore the changing regulatory landscape impacting on CM, and scientific and statistical considerations important to the implementation of RTRt.

Chairpersons: **José RAMIREZ, Amgen; Stan ALTAN, Janssen**

10:00am **Session Introduction**
José RAMIREZ, Amgen Inc.

10:05am The use of modeling and advanced process control in conjunction with continuous large molecule drug substance manufacturing
Olav LYNGBERG and Reza EIVASKHANI, Janssen

10:35am The value of Bayesian Statistics for Development and Validation of Continuous Manufacturing Processes
Bruno BOULANGER, PharmaLex

11:05am **Break**

11:20am **Parallel Breakout Sessions**
#1 – Current trends and issues in continuous manufacture driving drug development
Facilitated by Areti MANOLA, Janssen
#2 – Updating Limits Using Bayesian Methods
Facilitated by Tara SCHERDER, Synolostats, LLC

12:00pm Accelerated Process Design for Continuous Manufacturing: A Case Study of Evaluating Multiple Experimental Conditions in a Single Bioreactor Run
Li ZHANG and José RAMIREZ, Amgen Inc.

12:30pm **Panel Discussion**
Facilitator: Areti MANOLA, Janssen
Panelists: Li ZHANG, Bruno BOULANGER, José RAMIREZ, Stan ALTAN

1:30pm **End of Day 3**

DAY 4 – THURSDAY, NOVEMBER 11, 2021

10:00am **Keynote Address**
CMC Statistical Support for COVID-19 Vaccine Development: Running the Extra Mile!
Aili CHENG, Pfizer

Session IV *Case Studies of Acceleration with a Lifecycle Approach*

The development of biologics programs has evolved over time and has moved from generating limited amounts of information about our products and manufacturing processes, to fully embracing DoE concepts and generating insights about multiple factors and their interactions. Because of this evolution, patient and health authority expectations have increased, and these expectations are placing unique pressures on accelerated programs. This session includes case studies that showcase statistical approaches to accelerated CMC programs that leverage the life-cycle approach in order to overcome shorter development times while still employing established QbD principles for development.

Chairpersons: **Theodoro KOULIS, Genentech; Timo BAILER, Boehringer-Ingelheim**

10:30am **Session Introduction**
Theodoro KOULIS, Genentech

10:35am Moderna lessons learned: CMC statistics to accelerate technical development
Julia O'NEILL, Moderna

11:05am Development of Scale Down Models Using Statistical Analysis
Jinxin (Jerry) GAO, Eli Lilly and Company

11:35am **Break**

11:50am **Parallel Breakout Sessions**
#1 – Acceleration with a Lifecycle Approach to PV
Facilitated by Katherine GIACOLETTI, Merck & Co., Inc.
#2 – Bayesian Success Stories in CMC
Facilitated by Chuck MILLER, Merck & Co., Inc.

12:30pm CMC Approaches to Support Development and Supply of COVID Vaccines – an overview of cross-company discussions
Cristiana CAMPA, GlaxoSmithKline & Vaccines Europe

1:00pm **Panel Discussion**
Facilitator: Katherine GIACOLETTI
Panelists: Julia O'NEILL, Jinxin (Jerry) GAO, Cristiana Campa, Aili CHENG

2:00pm **Workshop Summary**

2:30pm **Close of Workshop**