Northern California Regional Forum

Challenges or Special Considerations When Developing ADC’s and Bispecifics

South San Francisco Conference Center
South San Francisco, CA

Thursday, October 12, 2017

Co-chairs:
Vinaya Kapoor, Tricida, Inc.
Trevor Swartz, Genentech, a Member of the Roche Group
The program committee gratefully acknowledges the following program partners and exhibitors for their generous support of the CASSS Northern California Regional Forum

### Program Partners

Genentech, a Member of the Roche Group

Seattle Genetics, Inc.

### Exhibitor Partners

Agilent Technologies

Bruker Daltonics, Inc.

ProteinSimple, a Bio-Techne brand

Waters Corporation
Acknowledgements

A special thanks to the program committee who helped develop this program!

Program Committee
Kris Antonsen, BioMarin Pharmaceutical, Inc.
Greg Cantin, Five Prime Therapeutics, Inc.
Jenny Chen, Nektar Therapeutics
Judy Chou, Bayer
Kathy Francissen, Genentech, a Member of the Roche Group
Michelle Frazier, Coherus Biosciences
Malou Gemeniano, Audentes Therapeutics, Inc.
Nomalie Jaya, Seattle Genetics, Inc.
Guifeng Jiang, Boehringer Ingelheim
Vinaya Kapoor, Tricida, Inc.
Robert McCombie, Genentech, a Member of the Roche Group

David Passmore
Joanne Severs, Bayer
Bryan Silvey, Kite Pharma, Inc.
Shelley Suggett, Bayer
Trevor Swartz, Genentech, a Member of the Roche Group
Lance Wong, Strand Bio
Min Young, Ultragenyx Pharmaceutical
Christopher Yu, Genentech, a Member of the Roche Group
Eike Zimmermann, Boehringer Ingelheim

CASSS Staff
Karen A. Bertani, CMP, Director of Meetings
Amy Cano, Administrative Assistant
Stephanie L. Flores, CAE, Executive Director
Julie Fowle, Meeting Coordinator
Anna Lingel, Meeting Coordinator
Carisa Lubeck, Business Information Analyst
Renee Olson, Senior Program Manager
Catherine Stewart, Finance Manager

Audio Visual
Michael Johnstone, MJ Audio-Visual Productions
Scientific Program Summary

Thursday, October 12, 2017

08:00 – 09:00  Registration and Continental Breakfast in the South Lobby

09:00 – 09:15  CASSS Welcome and Introductory Comments in Salon F
Stephanie Flores, CASSS, Emeryville, CA USA

09:15 – 09:30  Program Welcome in Salon F
Vinaya Kapoor, Tricida, Inc., South San Francisco, CA USA

09:30 – 10:15  A Regulator’s Perspective on Challenges in the Development of Antibody Drug Conjugates and Bispecific Antibodies
Marjorie Shapiro, CDER, FDA, Silver Spring, MD USA

10:15 – 10:45  Networking Break in the South Lobby

10:45 – 11:15  Antibody Discovery and Bispecific Design: Development Considerations
Aaron Sato, LakePharma, Inc., South San Francisco, CA USA

11:15 – 11:45  Advancements in ADC Manufacture and Control
Nathan Ihle, Seattle Genetics, Inc., Bothell, WA USA

11:45 – 12:30  Panel Discussion
Moderated by: Trevor Swartz, Genentech, a Member of the Roche Group, South San Francisco, CA USA

Panel Members:
Michelle Frazier, Coherus Biosciences, Redwood City, CA USA
Nathan Ihle, Seattle Genetics, Inc., Bothell, WA USA
Fred Jacobson, Genentech, a Member of the Roche Group, South San Francisco, CA USA
Marjorie Shapiro, CDER, FDA, Silver Spring, MD USA

12:30 – 13:30  Networking Lunch in Salon E

12:30 – 13:30  Career Development Luncheon Roundtable in Salon E
Grab your lunch and head to the reserved tables in Salon E
Thursday, October 12 continued…

13:30 – 14:15  Roundtable Discussions Session I in Salon F
14:15 – 14:45  Networking Break in the South Lobby
14:45 – 15:30  Roundtable Discussions Session II in Salon F
15:30 – 15:45  Closing Remarks in Salon F

Michelle Frazier, Coherus Biosciences, Redwood City, CA
Challenges or Special Considerations When Developing ADC’s and Bispecifics

The CASSS Northern California Regional Forum is committed to bringing job-relevant education and regulatory trends for biopharmaceuticals to CASSS members through meeting programs. The October forum will focus on understanding Antibody Drug Conjugates (ADCs) and Bispecific Monoclonal Antibodies (mAbs) and the unique challenges these molecules present during product development. The discussion will include content from other regional, national or international forums organized by CASSS and speakers from industry and FDA. The program will also provide a platform for networking with both peers and regulatory authorities.

Learning Objectives:

1. Discuss current CMC development FDA challenges, trends and expectations for ADCs and bispecifics with industry and FDA colleagues.

2. Learn industry best practices in overcoming development and regulatory challenges for ADCs and bispecific mAbs. Key areas of focus will include:
   a. Process development experiences and challenges in the conjugation chemistry for ADCs.
   b. Formulation, stability, and analytical method / characterization challenges with ADCs.
   c. Analytical method / characterization challenges in the development of bispecific antibodies.
   d. Control strategy considerations for bispecific antibodies and ADCs.

NOTES:
Advancements in ADC Manufacture and Control
Nathan Ihle, Seattle Genetics, Inc.

Antibody-drug conjugates (ADCs) have established themselves as an important new class of biotherapeutics. The pipeline of ADCs in clinical development or on the market has grown steadily, and with this experience, developers have built a better understanding of the criticality of quality attributes and manufacturing steps, and the most effective ways to establish controls. Examples of controls that have been effectively used will be presented, along with thoughts about how these strategies could be adapted as products mature, and how current experience could influence future control strategies.

Antibody Discovery and Bispecific Design: Development Considerations
Aaron Sato, LakePharma, Inc.

Using an array of antibody discovery technologies, anti-target binding pairs can be discovered for incorporation into a bispecific. In this process, different constructs as well as developability criteria need to be employed. This presentation will review this process towards developing a molecule that can move towards the clinic.

A Regulator’s Perspective on Challenges in the Development of Antibody Drug Conjugates and Bispecific Antibodies
Marjorie Shapiro, CDER, FDA

Monoclonal antibodies are the most successful class of biological products, with an increasing number of approvals in recent years, including three antibody-drug conjugates (ADCs) and 1 bispecific antibody (BsAb). ADCs and BsAbs are also an increasing proportion of the antibody-related products entering clinical development. The complexity of these constructs adds additional development, manufacturing analytical and regulatory challenges for sponsors and regulators. This presentation will describe FDA’s experience with ADCs and BsAbs.

NOTES:
Two tables will be set aside during the networking lunch to discuss career development. There will be a total of 20 seats available for this career development discussion – ten seats per table. Seating will be on a first come, first serve basis. The discussion points are listed below.

**TOPIC:** Career Development – Transferable Skills

**FACILITATORS:** Nomalie Jaya, *Seattle Genetics, Inc.*
Rob McCombie, *Genentech, a Member of the Roche Group*

**SCOPE:**
We will be discussing career development within the Biotech and Pharma Industries. We will explore myths regarding the number of years one must acquire in order to attain a desired position in a different area or discipline of the industry. We will also discuss transferable skills, management experience and strategic skills sets.

**DISCUSSION POINTS:**

1. **Is it important to have a degree in the field that you are pursuing?**
   a. For example, if the goal is to be a Director of Analytics, does one need a degree in chemistry or biology? Does one require a PhD?
   b. Is this the case for all careers? For example, does this hold true for Regulatory affairs or project management?

2. **How does one move from technical jobs to regulatory affairs, project management, quality assurance, and vice versa etc.?**
   a. What are transferable skills in the industry?
   b. How can you start thinking more cross-functionally?
   c. How can you think more strategically?

3. **Is it better to have a more diverse background or focus on one field for many years to be successful?**
   a. How can one gain more experience in one discipline yet still stay in their current position?

**NOTES:**
Roundtable Discussion Topics

For the first time, this program is offering two roundtable sessions, allowing you to select an additional topic to explore. Each session will be 45 minutes in length separated by a 30-minute networking break. During this break you will switch tables so that attendees will have the opportunity to participate in multiple discussions. There are 12 topics to choose from; all will be repeated in the second session. Seats are available on a first come, first serve basis. If a seat is not available at your first choice, please choose a different topic and return to your original choice during the second session.

Table 1: ADC: Analytical Methodologies for mAb, linker+payload, and Final ADC Drug Substance and Drug Product
Facilitator: Kevin Strozyk, Seattle Genetics, Inc.
Scribe: Nomalie Jaya, Seattle Genetics, Inc.

Table 2: Bioassay / Cytotoxicity / Impact of Conjugation on ADC
Facilitator: Jyoti Velayudhan, Seattle Genetics, Inc.
Scribe: Guicheng Sheng, Genentech, a Member of the Roche Group

Table 3: Stability Assessment for ADCs
Facilitator: Danielle Leiske, Seattle Genetics, Inc.
Scribe: Jenny Chen, Nektar Therapeutics

Table 4: ADC Process Development: mAb, Payload, Linker and Conjugation Chemistry
Facilitator: Hui-Min Zhang, Genentech, a Member of the Roche Group
Scribe: Christopher Yu, Genentech, a Member of the Roche Group

Table 5: ADC: Comparability Assessments
Facilitator: Jonathan van Dyck, Seattle Genetics, Inc.
Scribe: Guifeng Jiang, Boehringer Ingelheim

Table 6: ADC: Drug Product Formulation Considerations and Challenges
Facilitator: Jing Liu, Seattle Genetics, Inc.
Scribe: Joanne Severs, Bayer

Table 7: ADC: Use of CMOs / Containment
Facilitator: Ananya Dubey Kelsoe, Waters Corporation
Scribe: Rich Reynolds, Seattle Genetics, Inc.

Table 8: ADC: Regulatory Submission Strategies (IND and BLA) for the Payload and the Linker
Facilitator: Lingxing Zheng, Bayer
Scribe: Rob McCombie, Genentech, a Member of the Roche Group
Table 9: Bispecific: Analytical Methodologies for Testing, Characterization and Stability Assessments  
Facilitator: John Eschelbach, Genentech, a Member of the Roche Group  
Scribe: Greg Cantin, Five Prime Therapeutics, Inc.

Table 10: Bioassay Strategies to Assess Multiple MOAs for Bispecifics  
Facilitator: Ho-Yong Lee, Genentech, a Member of the Roche Group  
Scribe: Eike Zimmerman, Boehringer Ingelheim

Table 11: Bispecific Process Development and Comparability Assessments – DS and DP Considerations  
Facilitator: Christine Wu, Genentech, a Member of the Roche Group  
Scribe: Lance Wong, Strand Bio

Table 12: Challenges with Molecules that are Extremely Potent  
Facilitator: Jessica Egner, Genentech, a Member of the Roche Group  
Scribe: Shelley Suggett, Bayer

To view a full list of table topics, scopes and discussion questions, visit the CASSS website at http://www.casss.org/page/NCRF101706 or scan here:

NOTES: