CRITICAL PATH INSTITUTE (C-PATH) & INNOVATIVE MEDICINES INITIATIVE (IMI) 2ND ANNUAL MEETING

ACCELERATING THE DEVELOPMENT OF DRUGS, DIAGNOSTICS, AND DEVICES: PARTNERSHIPS TO EXPAND THE PRECOMPETITIVE SPACE

December 3, 2014
Perspectives on Partnering for Global Health

• The Driving Role of Consortia on the Critical Path to Innovative Therapies

• Paving the Critical Path of Development: The CDER Perspective
  J. Woodcock, NRDD 13, 783-784 (2014)

• The Critical Path Institute: Transforming Competitors into Collaborators
  M. Brumfield, NRDD 13, 785-786 (2014)

• Re-inventing Clinical Trials through TransCelerate
  D. Gill, NRDD 13, 787-788 (2014)

• The Biomarkers Consortium
  D. Wholley, NRDD 13, 791-792 (2014)

• The Predictive Safety Testing Consortium & the Coalition Against Major Diseases
  D. Stephenson and J-M. Sauer, NRDD 13, 793-794 (2014)
Accelerating the Development of Drugs, Diagnostics, and Devices: Partnerships to Expand the Precompetitive Space

AGENDA OVERVIEW

8:45 – 9:00  Welcome: Martha Brumfield and Michel Goldman
9:00 – 11:00  Session 1: Partnerships to Advance Regulatory Science and Leverage Global Biopharmaceutical Development
11:00 – 11:30  Break
11:30 – 1:00  Session 2: Safety Biomarkers: The PSTC and SAFE-T Collaboration
1:00 – 2:00  Lunch on the Concours Terrace
2:00 – 4:00  Session 3: Maximizing the Value of Data Shared by Multiple Organizations
4:00 – 4:30  Closing Remarks: Key Messages and Identification of Key Next Steps
4:30 – 7:00  Reception (on Concours Terrace located on the Lobby Floor)
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December 3, 2014
Session 1:

Partnerships to Advance Regulatory Science and Leverage Global Biopharmaceutical Development
A Vision for Future Collaborative Efforts

Collaboration across Consortia
- Benefits of a non-competitive workspace
- Combining forces across collaborative efforts

Global View
- Non US or non EU centric approach as drug development is global

Importance of FDA/EMA Participation
- Connect needs of development and regulatory science

Proactive Approach to Data Sharing
- Up front collaboration on how data are collected, generated, shared
**Session 1: Partnerships to Advance Regulatory Science and Leverage Global Biopharmaceutical Development  (9:00 am – 11:00 am)**

<table>
<thead>
<tr>
<th>Co-chairs/Moderators:</th>
<th>Martha Brumfield (C-Path) and Michel Goldman (IMI)</th>
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</thead>
</table>
| **Panelists:**        | William Chin (PhRMA)  
                        Dalvir Gill (TransCelerate BioPharma Inc)  
                        David Wholley (FNIH)  
                        Janet Woodcock (FDA) |
| **Panel Discussion Topics:** | ‣ What have partnerships produced that could not have been accomplished by a single organization?  
                               ‣ What metrics should be applied to evaluating partnerships?  
                               ‣ What are the key challenges facing today’s partnerships, and how can those challenges be optimally addressed?  
                               ‣ What factors should be considered when partners prioritize projects?  
                               ‣ How can newly formed partnerships leverage ongoing efforts of established partnerships?  
                               ‣ How to ensure coordination? |
An Overview of TransCelerate Biopharma Inc.

Dalvir Gill, PhD - Chief Executive Officer

03 December, 2014
Our Purpose

TransCelerate is a Not For Profit Entity Created To Drive Collaboration

History
Launched in 2012, TransCelerate evolved from discussions at various forums for executive R&D leadership to debate issues facing the industry, and examine solutions for addressing agreed-upon common challenges.

Vision
To improve the health of people around the world by accelerating and simplifying the research and development of innovative new therapies.

Mission
To collaborate across the global research and development community to identify, prioritize, design and facilitate implementation of solutions designed to drive the efficient, effective and high quality delivery of new medicines.
19 Pharmaceutical Companies* providing their best talent to collaborate and develop solutions to overcome industry Inefficiencies

* 10 Pharmaceutical Companies chartered TransCelerate and 9 additional companies joined in 2013
Our Industry Position

TransCelerate is often a “catalyst” to open the doors for collaboration amongst industry groups outside of TransCelerate.
TransCelerate currently has 11 projects which share the goals of increasing quality, patient safety & accelerating development timelines

1. Model Approach for High-Quality, Risk-Based Monitoring*
2. Shared Site Qualification and Training*
3. Shared Investigator Platform*
4. Clinical Data Standards – Efficacy (in partnership with CFAST)*
5. Comparator Drugs for Clinical Trials*
6. Common Protocol Template
7. Investigator Registry
8. Pediatric Trial Efficiencies
9. Clinical Trial Diversification
10. Clinical Data Transparency
11. Quality Management System

*Original initiative which began in 2012
David Wholley
Director, Research Partnerships

Critical Path Institute-IMI Joint Meeting
December 3, 2014
Purpose
Created by Congress:
→ To support the NIH in its mission;
→ To advance collaboration with biomedical researchers from universities, industry and not-for-profit organizations.

Structure
• 501(c)(3) not-for-profit organization;
• Independent Board of Directors;
• NIH Director and FDA Commissioner ex-officio Board Members

Highlights
• Raised over $800 million since 1996;
• Supported over 500 projects;
  • research partnerships
  • scientific education/training
  • conferences/events
  • capital programs
Funding & Partnership Models

**Model 1**

- Private Sector Funders
  - FNIH
  - NIH
  - Intramural or Extramural Lab

**Model 2**

- Private Partners
  - FNIH
  - NIH
  - Scientific Programs & Research

- FNIH Steering Committee/Project Team

- NIH

- FDA

- Scientific Interaction

- $$ Flow
Select Programs

- **VCTR**: Vector-based Control of Transmission: Discovery Research
  - Grand Challenges in Global Health

- **LUNG-MAP**: Lung-MAP

- **ADNI**: ADNI (Age-Related Eye Disease Study 2)
  - Funded by the National Institutes of Health

- **AREDS2**: AREDS2

- **Spiromics**: Spiromics

- **CTVIMC**: CTVIMC

- **Biomarkers Consortium**: www.biomarkersconsortium.org

- **Geoffrey Beene**: 2013 Global NeuroDiscovery Challenge

- **FAIH**: Foundation for the National Institutes of Health

- **Alzheimer's Disease**: Accelerating Medicines Partnership
  - Rheumatoid Arthritis
  - Type 2 Diabetes

- **Disease Molecules**: Public Private Partnerships
Accelerating Medicines Partnership

• Public-private partnership with NIH, 10 companies, non-profits

• Aims to distinguish targets of disease most likely to respond to new therapies in:
  • Alzheimer’s Disease
  • Type 2 Diabetes
  • RA/SLE

• Launched in 2014, $230M investment over five years on pilot projects

• FNIH secures private sector funding, establishes governance, and provides program and project management for AMP.
## AMP T2D Information Portal

### Datasets of interest

<table>
<thead>
<tr>
<th>Project</th>
<th>Description</th>
<th>Ethnicity</th>
<th>Sample Size</th>
<th>Status</th>
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<tbody>
<tr>
<td>CHARGE</td>
<td>Cohorts for Heart and Aging Research in Genomic Epidemiology</td>
<td>multi-ethnic</td>
<td>38,000</td>
<td>Aspirational</td>
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<tr>
<td>DIAGRAM</td>
<td>Diabetes Genetics; T2D, QTs</td>
<td>European</td>
<td>34,840 cases 114,981 controls</td>
<td>Discussions initiated</td>
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<td>FIND</td>
<td>Nephropathy and Diabetes; familial</td>
<td>Mexican/African/Native American</td>
<td>2,622 genotype/phenotype</td>
<td>Discussions initiated</td>
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<tr>
<td>GoT2D</td>
<td>T2D Genetics; T2D, QTs</td>
<td>European</td>
<td>3,000 whole genome/exomes/SNP arrays</td>
<td>Some in portal</td>
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<tr>
<td>IMIDIA</td>
<td>IMI for Diabetes; Human islet cells</td>
<td>European</td>
<td>465; 93 T2D</td>
<td>Discussions initiated</td>
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<td>MAGIC</td>
<td>Glucose and Insulin-related traits; glycemic/metabolic traits</td>
<td>European</td>
<td>133,010 GWAS</td>
<td>Discussions initiated</td>
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<tr>
<td>NHLBI ESP</td>
<td>Exome Sequencing; T2D, QTs</td>
<td>multi-ethnic</td>
<td>6,800 exomes; ~1,000 T2D</td>
<td>In portal</td>
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<tr>
<td>SIGMA</td>
<td>Genomic Medicine for the Americas; T2D, QTs</td>
<td>Mexican/Latin American</td>
<td>4,200 exomes</td>
<td>Permission granted; data being collected</td>
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<td>SUMMIT</td>
<td>IMI Surrogate markers for Micro- and Macro-vascular endpoints; diabetic complications</td>
<td>European</td>
<td>10,000 GWAS/exomes</td>
<td>Discussions initiated</td>
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<tr>
<td>T2D GENES</td>
<td>T2D Genetics Next-generation sequencing; T2D, some QTs</td>
<td>multi-ethnic</td>
<td>100,000: ~250 genes, 9,000 SNPs; 600 WGS; 11,000 exomes</td>
<td>In portal</td>
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<tr>
<td>TODAY</td>
<td>Treatment Options for T2D in Adolescents and Youth; T2D 10-17 year olds with treatment</td>
<td>Caucasian/African/Hispanic American</td>
<td>~ 700</td>
<td>Some in portal</td>
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</table>
Biomarkers Consortium

*Fosters the exchange of knowledge and expertise among industry, academic, and government leaders*

- Qualifies biomarkers for specific applications in diagnosing disease, predicting therapeutic response, and improving clinical practice.

- Generates information useful to inform **regulatory decision-making**.

- Employs rigorous, inclusive governance and project management with clearly defined goals and milestones.

- Addresses a broad range of disease / therapeutic areas – cancer, neuroscience, metabolic disorders, immunity & inflammation.

- Pre-competitive; makes consortium project results broadly available to the entire scientific community.

**Our Founding Partners:** FDA, NIH, FNIH, PhRMA, BIO, CMS
Biomarkers Consortium Kidney Safety Project

$4M; 4-year project: Amgen, AZ, FDA, FNIH, J&J, Lilly, Merck, NIDDK, Pfizer, PSTC

Healthy Volunteer Biomarker Analysis

Retrospective Analysis

Prospective Analysis (2 Clinical Studies)

Sample Bank & Database

Publications, Regulatory Submissions

Funds raised: 80% FNIH; 20% PSTC

Lead PI: Frank Sistare, Merck
Developing a Common Regulatory Strategy with the IMI SAFE-T Consortium

Timeline and List of Joint Activities

• Q2 2012 – Joint F2F Meeting between the IMI SAFE-T Team leaders and select Biomarkers Consortium Kidney Safety/PSTC Project members in Paris during the European Renal Annual Meeting
• Q4 2013 – Joint CDA executed
• Regular calls in 2014 to develop a joint regulatory strategy
• IMI SAFE-T representative invited to attend FNIH/PSTC FDA/EMA meeting discussions
• Shared documents:
  • List of biomarkers considered for submission for qualification
  • All regulatory feedback received
  • Context of Use Statement
  • Statistical analysis plans