G2MC 2015 Symposium:
Implementing Genomic Medicine into Practice

November 6 and 7, 2015

Matrix Building
Aspiration Theatrette, Level 2M
30 Biopolis Street
Singapore 138671

Meeting Objectives:
- To highlight nations or organizations around the world that are implementing genomic medicine into practice
- To foster/facilitate collaborations to enable the implementation of genomic medicine
- To highlight best practices and lessons learned to enable others to effectively implement genomic medicine approaches
- To identify and develop solutions for overcoming obstacles to genomic medicine implementation
- To identify and discuss regulations and policies that impact the implementation of genomic medicine
- To create a global tool box for implementation of genomic medicine into practice

November 6, 2015

7:45 A.M. Working Breakfast

WELCOME AND OVERVIEW

8:30 A.M. Welcoming Remarks and Goals for the Meeting

Geoffrey Ginsburg, G2MC Co-Chair
Director, Duke Center for Applied Genomics & Precision Medicine;
Professor of Medicine and of Pathology and Biomedical Engineering,
Duke University Medical Center

Robyn Ward, G2MC Co-chair
Deputy Vice Chancellor, University of Queensland, Australia
Chair of Medical Services Advisory Committee, Australia
KEYNOTE ADDRESS

8:50 A.M.  Introduction: John E. L. Wong, National University Health System

8:55 A.M.  David Bentley  
Vice President and Chief Scientist  
Illumina

9:20 A.M.  Brief discussion

SESSION I: COUNTRY UPDATES, PART I

Session Questions:
- What are the primary activities related to genomic medicine that your group has undertaken or completed in the past two years?
- What would you identify as your group’s key accomplishments and challenges related to genomic medicine in the past two years?
- What opportunities do you see for collaboration with G2MC or among the attendees?

Moderator: Teri Manolio, Director, Division of Genomic Medicine, National Human Genome Research Institute (U.S.)

9:30 A.M.  Introduction

New participant countries and updates from existing members:

Africa

9:35 A.M.  Division of Human Genetics, University of Cape Town (South Africa)  
Ambroise Wonkam  
Medical Geneticist, Health Professions Council of South Africa;  
Associate Professor/Senior Consultant, Division of Human Genetics;  
Faculty of Health Sciences  
University of Cape Town
Middle East

9:45 A.M.  
**Clalit National Personalized Medicine Program (Israel)**  
Gad Rennert  
Director, Clalit National Cancer Control Center and National Personalized Medicine Program;  
Professor and Chairman,  
Department of Community Medicine and Epidemiology,  
Carmel Medical Center;  
Rappaport Faculty of Medicine  
Technion-Israel Institute of Technology

Europe

9:55 A.M.  
**Belgian Medical Genomics Initiative (Belgium)**  
Marc Abramowicz  
Professor and Head  
Medical Genetics  
University Libre de Bruxelles

10:05 A.M.  
**Luxembourg Centre for Systems Biomedicine (Luxembourg)**  
Rudi Balling  
Director  
Luxembourg Centre for Systems Biomedicine  
University of Luxembourg

South/Central Asia

10:15 A.M.  
**Human Genetics Unit, University of Colombo (Sri Lanka)**  
Vajira Dissanayake  
Director, Human Genetics Unit  
University of Colombo

10:25 A.M.  
**Break**

Updates continued:

East Asia and Pacific

10:40 A.M.  
**National Health Committee (New Zealand)**
Peter Guthrie
General Manager, National Health Committee
New Zealand

10:50 A.M.  
**Melbourne and Australian Genomics Alliance (Australia)**
Andrew Sinclair  
Deputy Director  
Murdoch Children’s Research Institute

11:00 A.M.  
**Genetic Counselling Program, University of Sydney (Australia)**
Kris Barlow-Stewart  
Director, Master of Genetic Counselling Program  
University of Sydney

11:10 A.M.  
**Cancer 2015 (Australia)**
Steven Fox  
Director of Pathology  
Peter MacCallum Cancer Centre

11:20 A.M.  
**Towards a National Precision Medicine Strategy (Singapore)**
Patrick Tan  
Professor  
Duke-National University of Singapore Graduate Medical School/Genome Institute of Singapore

Tai E Shyong  
Associate Professor  
National University Hospital

11:30 A.M.  
**Genomic Medicine Program for Cancer (Japan)**
Satoru Miyano  
Professor  
University of Tokyo

11:40 A.M.  
Moderated panel discussion

12:10 P.M.  
**Break for Lunch**
### SESSION II: LARGE-SCALE SEQUENCING PROJECTS

**Session Questions:**

- What information was used for the study design (e.g. sample size, demographics, phenotypes, patient recruitment and clinician engagement)? Was a pilot project used or considered?
- What sequencing platform was selected? Why? What is the sequencing depth for germline and somatic variants, if applicable?
- Are there any preliminary data from the study?
- How do you deal with the various ELSI? Are there any particular elements (e.g., cultural, religious issues) that require attention?
- What are the challenges and solutions to implement genomic data at each one of the following: patient, provider and health care system level?
- How will the program drive meaningful use in health care?

**Moderators:** George P. Patrinos, University of Patras and Fahd Al-Mulla, Kuwait University

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<tr>
<th>Time</th>
<th>Presentation</th>
<th>Speaker(s)</th>
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<td>1:10 P.M.</td>
<td>Introduction</td>
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<td>1:15 P.M.</td>
<td><strong>Genomics England</strong></td>
<td>Tim Hubbard&lt;br&gt;Head of Bioinformatics&lt;br&gt;Genomics England</td>
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<td>1:25 P.M.</td>
<td><strong>Iceland deCODE Project</strong></td>
<td>Kári Stefánsson&lt;br&gt;President, CEO, and Director&lt;br&gt;deCODE genetics</td>
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<td>1:35 P.M.</td>
<td><strong>Regeneron-Geisinger Genome Project (U.S.)</strong></td>
<td>Alan Shuldiner&lt;br&gt;Vice President and Co-Head&lt;br&gt;Regeneron Genetics Center&lt;br&gt;Regeneron Pharmaceuticals, Inc.</td>
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<td>1:45 P.M.</td>
<td><strong>Genome Qatar</strong></td>
<td>Asma Al-Thani&lt;br&gt;Head and Associate Professor of Virology&lt;br&gt;Health Sciences Department</td>
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1:55 P.M.  **Estonian Genome Project**  
Andres Metspalu  
Professor and Director  
Estonian Genome Center  
University of Tartu

2:05 P.M.  Moderated Panel Discussion

2:25 P.M.  **Break**

Presentations continued:

2:40 P.M.  **Precision Medicine Initiative in Korea**  
Jeong-Sun Seo  
Professor  
Genomic Medicine Institute Department of Biochemistry and Molecular Biology  
Seoul National University College of Medicine  

Jong-II Kim  
Professor  
Genomic Medicine Institute Department of Biochemistry and Molecular Biology  
Seoul National University College of Medicine  

Rong-Min Baek  
Professor  
Seoul National University College of Medicine

2:50 P.M.  **Malaysia**  
Zahurin Mohamed  
Professor  
Department of Pharmacology  
Faculty of Medicine  
University of Malaya

3:00 P.M.  **Saudi Arabia**  
Corina Shtir
Senior Director of Population Genomics  
Life Sciences Solutions  
Thermo Fisher Scientific

3:10 P.M.  
**Precision Medicine Initiative (U.S.)**  
Teri Manolio  
Director, Division of Genomic Medicine  
National Human Genome Research Institute  
National Institutes of Health

3:20 P.M.  
**Scotland**  
Sean Grimmond  
Chair of Medical Genomics  
Wolfson Wohl Cancer Research Centre  
Institute for Cancer Sciences,  
University of Glasgow

3:30 P.M.  
Moderated Panel Discussion

4:00 P.M.  
**Break**

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**SESSION III: COUNTRY UPDATES, PART II**

Session Questions:

- What are the primary activities related to genomic medicine that your group has undertaken or completed in the past two years?
- What would you identify as your group’s key accomplishments and challenges related to genomic medicine in the past two years?
- What opportunities do you see for collaboration with G2MC or among the attendees?

**Moderator: Patrick Tan**, Duke-NUS Graduate Medical School Singapore/Genomic Institute of Singapore

4:15 P.M.  
Introduction

Updates from current members:

**Western Hemisphere**

4:20 P.M.  
**Duke University Center for Applied Genomics and Precision Medicine (U.S.)**  
Geoffrey Ginsburg, *G2MC Co-Chair*
Director, Duke Center for Applied Genomics & Precision Medicine; Professor of Medicine and of Pathology and Biomedical Engineering, Duke University Medical Center

4:30 P.M. **University of Alabama-Hudson Alpha Center for Genomic Medicine (U.S.)**
Bruce R. Korf
Professor and Chair
Department of Genetics
University of Alabama at Birmingham

4:40 P.M. **Intermountain Healthcare Clinical Genetics Services (U.S.)**
Steven Bleyl
Co-Director, Clinical Genetics Services
Intermountain Healthcare

4:50 P.M. **National Human Genome Research Institute (U.S.)**
Teri Manolio
Director, Division of Genomic Medicine
National Human Genome Research Institute
National Institutes of Health

5:00 P.M. **Genome Canada**
Cindy Bell
Interim President and CEO
Genome Canada

**Global Initiatives**

5:10 P.M. **Genomic Medicine Alliance**
George P. Patrinos
Associate Professor
Department of Pharmacy
University of Patras

5:20 P.M. **Global Alliance for Genomics and Health**
Peter Goodhand
Executive Director
Global Alliance for Genomics and Health

5:30 P.M. Moderated Panel Discussion
6:00 P.M.  

**Closing Remarks for Day 1**

Geoffrey Ginsburg, *G2MC Co-Chair*
Director, Duke Center for Applied Genomics & Precision Medicine;  
Professor of Medicine and of Pathology and Biomedical Engineering,  
Duke University Medical Center

Robyn Ward, *G2MC Co-chair*
Deputy Vice Chancellor, University of Queensland, Australia  
Chair of Medical Services Advisory Committee, Australia

John E. L. Wong, *Meeting Host*
Isabel Chan Professor in Medical Sciences  
Chief Executive, National University Health System  
Senior Vice President (Health Affairs), National University of Singapore

7:00 P.M.  

**Dinner for Invited Guests**
G2MC Fall 2015 Symposium: Implementing Genomic Medicine into Practice

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November 7, 2015

7:45 A.M. Working Breakfast

WELCOME AND OVERVIEW

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Chair of Medical Services Advisory Committee, Australia

KEYNOTE ADDRESS

8:40 A.M. Introduction: John E. L. Wong, National University Health System

8:45 A.M. Ching Yee Tan
Permanent Secretary (Health)
Singapore
SESSION IV: GLOBAL POLICY AND REGULATION

Moderator: Robyn Ward, University of Queensland (Australia)

9:15 A.M. Introduction and Setting the Scene

9:25 A.M. Research Sector: Misaligned or Uninformed?
Warwick Anderson
Secretary-General, Human Frontier Science Program, Cedex, France

9:40 A.M. Impact of Genomic Medicine on the Future of Health Care: A Regulator’s Perspective
May Ling Choong
CEO, Health Sciences Authority, Singapore

9:55 A.M. The Drivers of Clinical Practice in the Omics Era
Russell L. Gruen
Professor of Surgery, Lee Kong Chian School of Medicine, Singapore
Director, Nanyang Institute of Technology in Health and Medicine, Nanyang Technological University, Singapore

10:10 A.M. Break

10:25 A.M. Getting Omics into Health Care: What’s For Sale and Why Aren’t Governments Buying?
Robyn Ward, G2MC Co-chair
Deputy Vice Chancellor, University of Queensland, Australia
Chair of Medical Services Advisory Committee, Australia

10:40 A.M. Pull, Plant and Embed: The Full Picture Policy Framework
Anne Kolbe
Chair, National Health Committee, New Zealand
Associate Professor, University of Auckland, New Zealand

10:55 A.M. Discussion on Topics (led by Peter Goodhand, Global Alliance for Genomics and Health and Bruce Burnett, Director of Regulatory Affairs and Quality, Duke Translational Institute, Duke University)
SESSION V: TECHNOLOGY AND DATA SOLUTIONS FOR IMPLEMENTATION

Session Questions:
- What problem is your company’s technology trying to solve?
- What challenges need to be addressed in order to fully implement solutions into clinical medicine?
- What solutions does your organization offer?
- Who are your key partners?
- Are there any international considerations?

Moderator: Geoffrey Ginsburg, Duke University (U.S.)

12:45 P.M. Introduction

Sequencing and Informatics Stakeholder Talks

12:50 P.M. Erkki Leego
IT Advisor
Estonian Genome Center, University of Tartu

1:00 P.M. David Bentley
Vice President and Chief Scientist
Illumina, Inc.

1:10 P.M. Jeyaseelan Jeyaraj
Director, Health Sciences, Asia Pacific
Oracle

1:20 P.M. Scott Moss
Research Informatics Development Lead
Epic

1:30 P.M. Sam Shekar
Chief Medical Officer
Northrop Grumman Health Information Systems

1:40 P.M. Ketan Paranjape
General Manager, Life Sciences and Analytics
Intel
SESSION VI: WORKING GROUP BREAK-OUT SESSIONS

Session Questions:
- Who are the participants and countries represented in your group?
- What are the major ongoing projects in your working group?
- What are your top priorities for enabling genomic medicine implementation?
- Are there opportunities for collaboration?
- What are you next steps?

2:35 P.M.  Working Groups Meet

**Policy** (Video Conference Room, Matrix level 3)
Facilitators: Anne Kolbe and Robyn Ward
Note taker: Geraldine Cheng, MOH

**Pharmacogenomics** (Meeting room 1, Matrix level 3)
Facilitators: Wasun Chantratita and George Patrinos
Note taker: Grace Tan, MOH

**IT/Bioinformatics** (Ciston meeting room, Matrix level 5)
Facilitators: Steve Bleyl and Erkki Leego
Note taker: Melissa Guan, BMS IPO

**Education** (Meeting room 2, Matrix level 3)
Facilitators: Bruce Korf and Vajira Dissanayake
Note taker: Angie Lim, NUS

**Evidence** (Meeting room 3, Matrix level 3)
Facilitators: Fahd Al-Mulla and Marc Abramowicz
Note taker: Deborah Kee, BMS IPO

**Sequencing Projects** (Codon meeting room, Matrix level 5)
Facilitator: Alan Shuldiner
Note taker: Seet Qihui, BMS IPO

4:00 P.M.  Break
SESSION VII: STRATEGIC PLANNING

5:10 P.M. Future Priorities and Efforts Going Forward

SESSION VIII: ADJOURN

5:40 P.M. Summary of Action Items and Final Words

Geoffrey Ginsburg, G2MC Co-Chair
Director, Duke Center for Applied Genomics & Precision Medicine;
Professor of Medicine and of Pathology and Biomedical Engineering,
Duke University Medical Center

Robyn Ward, G2MC Co-chair
Deputy Vice Chancellor, University of Queensland, Australia
Chair of Medical Services Advisory Committee, Australia

6:00 P.M. Closing Remarks for Meeting
John E. L. Wong, *Meeting Host*
Isabel Chan Professor in Medical Sciences
Chief Executive, National University Health System
Senior Vice President (Health Affairs), National University of Singapore

6:10 P.M.  
*Adjourn*