PRISME Forum

Pharmaceutical R & D Information Systems Management Executives

PRISME Forum

TECHNICAL MEETING

The Potential of Artificial Intelligence in Healthcare

PRISME Forum Chair:

Olivier Gien, *Sanofi*

PRISME Forum Technical Meeting Chair:

Keith Murphy, *Pfizer*

November 15-16, 2017

Cambridge, MA

Host: Pfizer

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PRISME Forum Fall 2017 Technical Meeting App:

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Meeting Venue

All sessions will be hosted by Pfizer and held at: 1 Portland St, Cambridge, MA 02139.

Hotel

Kimpton Onyx, 155 Portland St, Boston, MA 02114.

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PRISME Forum Host

The PRISME Forum Technical Meeting Advisory Committee would like to thank Pfizer for hosting the 2017 PRISME Forum fall meeting.

PRISME Forum Statement of Compliance

"All meetings, working groups and communications will be open to all Members and any records thereof will be non-confidential and available for inspection by any Member. The Members acknowledge that discussing any commercially sensitive topics, including costs, volumes, inventories, sales level methods, channels of distribution, access to future products, markets, current or future prices, profitability, ***contract pricing or trading terms*** is prohibited. The Members of PRISME will strictly comply with all laws relevant to their activities, including US state and federal anti-trust laws and European competition laws."

The Potential of Artificial Intelligence in Healthcare

The Merriam-Webster dictionary defines Artificial Intelligence as a:

1) branch of computer science dealing with the simulation of intelligent behavior in computers and/or
2) the capability of a machine to imitate intelligent human behavior.

The two characteristics of AI that are often most closely associated to human intelligence are "learning" and "problem solving". There are many technologies, both emerging and established, that fall into this general category. These include machine learning, neural networks, deep learning, and natural language processing, to name a few. These technologies have the potential to significantly impact the pharmaceutical industry, and more broadly the healthcare industry, in the next decade.

On the other hand, while we are seeing genuine advances in AI, we are also seeing an acceleration of the hype. Expectations are likely outpacing the technologies' readiness to deliver at scale. Nevertheless, many technologists have confidence in the underlying approach and capabilities being developed today.

At the PRISME Forum Fall 2017 Technical Meeting, we will explore promising applications of AI in Biopharmaceutical R&D, as well as relevant initiatives in other industry sectors. We will address best practices from the perspective of the supporting infrastructure, e.g. data, compute, platforms and policy. It is understood that data is foundational to the application of AI technologies; as such this Technical Meeting is a logical follow-up to our PRISME Forum Spring 2017 data-focused discussions.

PROGRAM

All sessions will be held at Pfizer at its Kendall Square campus (1 Portland St, Cambridge, MA 02139).

WEDNESDAY, November 15, 2017		
18:45	*Gather in the Kimpton Onyx Hotel (155 Portland Street, Boston, MA) lobby for departure to PRISME Forum Group Reception to be held at West End Johnnie's, 138 Portland St, Boston, MA 02114*	
THURSDAY, November 16, 2017		
07:30	*Gather in the Kimpton Onyx Hotel lobby for departure to the meeting venue*	
08:00	*Check-in, continental breakfast and poster installation*	
08:30	**Welcome Notes & Introductions**	**Olivier Gien,** VP, Global Head Medical IT, *Sanofi*; Chair, *PRISME Forum* **Keith Murphy,** Senior Director, R&D Business Technology, *Pfizer;* Technical Meeting Chair, *PRISME Forum*
SESSION I: Keynote Presentations **AI in Biopharma R&D & Healthcare**		**Chair: Keith Murphy,** Senior Director, R&D Business Technology, *Pfizer;* Technical Meeting Chair, *PRISME Forum*
08:45	**Precision Medicine and Targeted Marketing -** A Medical Doctor's perspective	**Anthony Philippakis,** Chief Data Officer, *Broad Institute*
09:20	**A Technology Consultant's perspective**	**Michael Shanler,** VP, Research, *Gartner*
09:55	*Coffee Break*	
SESSION II: **Shark Tank aka Dragon's Den Session**		**Co-Chairs: Klaus Hofenbitzer,** Senior Director, Enterprise Architecture, *Celgene* **Ashok Upadhyay,** Global R&D IT Leader, *Otsuka Pharmaceutical Companies*
10:25	**Introduction**	
10:30	**Start-up #1 with Q&A: Precision Digital Health – Thomas Wells,** CEO and Co-Founder	Introduced by *Brooks Hill Partners*
10:45	**Start-up #2 with Q&A:** **nQ Medical – Richie Bavasso,** CEO/Co-founder Scientist	Introduced by **Eyal Geffen**, Managing Partner, *Sky Ventures*
11:00	**Start-up #3 with Q&A:** **Asimov – Raja Srinivas,** Co-founder	Introduced by **Mark McAndrew**, Partner, *Andreessen Horowitz*
11:15	**Start-up #4 with Q&A:** **Freenome – Imran Haque,** CSO	Introduced by **Mark McAndrew**, Partner, *Andreessen Horowitz*
11:30	**Start-up #5 with Q&A:** **Wellth – Matthew Loper,** CEO/Co-founder	Introduced by *Beta Bridge Capital*
11:45	**Conclusions**	
	PRISME Forum Shark Tank Evaluation Panel Members: 1. **Klaus Hofenbitzer (co-chair),** Senior Director, Enterprise Architecture, *Celgene* 2. **Munther Baara,** Senior Director, Development Business Technology, *Pfizer* 3. **Heather Bell,** Senior Vice President, Global Head of Digital and Analytics, *Sanofi* 4. **David Sedlock,** Head, Global Research IT, *Takeda Pharmaceuticals* 5. **Ashok Upadhyay (co-chair),** Global R&D IT Leader, *Otsuka Pharmaceutical Companies*	

THURSDAY, November 16, 2017 (cont.)		
SESSION III A: **Posters**		**Chair: John Apathy,** VP, R&D Informatics, *Celgene*
11:55	*Introduction*	
12:00	*Poster Rotations (three 15-minute rotations)*	
P1	**Smart Molecular Similarity Search**	**Ari Yacobi,** Chief Data Scientist, *Knowledgent* **Tom Johnstone,** Managing Partner, Life Sciences, *Knowledgent*
P2	**AI in Patient Stratification: From 'omics to Digital Biomarkers**	**Tim Guilliams,** CEO, *Healx* **David Brown,** Chairman and CSO, *Healx*
P3	**AI and Analytics on Smart Device Data Capture: Successful Passive Monitoring of Early-Stage Parkinson's Disease Patient Mobility in a Phase I RG7935/PRX002 Clinical Trial with Smartphone Sensors**	**Wei-Yi Cheng,** Senior Scientist, *Roche Innovation Center New York*
P4	**AI - Combining Biological Science with Machine Learning**	**Christopher Gibson,** Co-Founder and CEO, *Recursion Pharmaceuticals*
P5	**Machine Learning to Machine Teaching: Intelligence by Design**	**Akshay Vashist,** Director - Data Sciences, *Otsuka Pharmaceutical Companies*
P6	**AI – Application of IBM Watson's Cognitive Computing Capabilities in Research**	**John Gregory,** Director, Project & Portfolio Management Business Technology, *Pfizer*
12:45	*Lunch*	
SESSION III B: **Posters**		**Chair: John Apathy,** VP, R&D Informatics, *Celgene*
13:45	*Poster Session (Remaining three 15-minute rotations)*	
SESSION IV: **Plenary Presentations - AI in Biopharma R&D**		**Chair: Alex Schuleit,** Senior R&D Business IT Development Manager, *Lundbeck*
14:30	**AI in Biopharma – A Biopharmaceutical Industry Perspective**	**Debbie Profit,** VP, Information Technologies, *Otsuka Pharmaceutical Companies*
15:00	**A CRO perspective**	**Gary Shorter,** Head of AI, R&D Solutions, *QuintilesIMS*
SESSION V: **Break-out Session & Coffee**		**Co-Chairs: Massimo de Francesco,** Senior Director, Head of Informatics, *UCB* **Sebastien Lefebvre,** Senior Director, Data Analytics & Decision Support, *Alexion Pharmaceuticals*
15:30	**Breakout Session –** Members and meeting guests will be divided into five groups led by co-captains	**Co-captains:** Group A: **Klaus Hofenbitzer (lead) supported by start-up #1** Group B: **Munther Baara (lead) supported by start-up #2** Group C: **Heather Bell (lead) supported by start-up #3** Group D: **David Sedlock (lead) supported by start-up #4** Group E: **Ashok Upadhyay (lead) supported by start-up #5**
16:00	**Plenary Session –** Readouts from breakout groups	**Chair: Lars Greiffenberg,** Director - R&D IT and Translational Informatics, *AbbVie*
SESSION VI: **Meeting Summary, Awards & Reception**		**Chair: Keith Murphy,** Senior Director, R&D Business Technology, *Pfizer;* Technical Meeting Chair, *PRISME Forum*
16:30	Meeting Summary	
16:45	Awards & Networking Reception	
18:00	*Return to the hotel*	

BIOS AND ABSTRACTS

PRISME Forum Chair: Olivier Gien

VP, Global Head Medical IT, *Sanofi*

Olivier Gien, PhD, was elected as the Chairman of the PRISME Forum at the November 2014 PRISME Forum Business Meeting.

Dr. Gien is the Global Head of Clinical IT at Sanofi. He is a Chemical Engineer by training and holds a PhD in Organic Chemistry. His PhD work focused on leveraging Artificial Intelligence technologies and retrosynthetic analysis to build a system helping chemists in the design of synthetic routes.

Dr. Gien started his career in the Exploratory Unit of Sanofi's Hungarian affiliate in Budapest then took charge of Information Systems for Industrial Chemical development at Sanofi's Sisteron site. He led then Global Discovery Research Information Systems at Sanofi-Synthelabo, then Sanofi-Aventis in Montpellier, before taking on his new role in Paris area in 2010.

PRISME Forum Technical Meeting Chair: Keith Murphy

Senior Director, R&D Business Technology, *Pfizer*

Keith Murphy is a Sr. Director in Pfizer Research and Development Business Technology (R&D BT). Keith and his team work closely with their R&D customers, and key partners, to develop business-aligned IT strategy and associated technical solutions across the spectrum of their scientific operations. This includes large and small molecule design, pharmaceutical development, clinical manufacturing, and clinical supply.

Mr. Murphy has over 30 years of experience working in the Pharmaceutical Industry. A chemical engineer by trade, he started in Pfizer's manufacturing organization and worked in various roles including process engineering, automation, and IT. He joined Pfizer's R&D operations about 10 years ago as the lead for Pharmaceutical Sciences IT. Over the years, he has developed particular experience in developing and implementing IT strategy, across manufacturing and research. More recently, he and his team have been focused on improved data management, enabling both primary and secondary uses.

Mr. Murphy has a BS in Chemical Engineering and an MS in Computer Science.

SESSION I
KEYNOTE PRESENTATIONS: AI in Biopharma R&D & Healthcare

Session Chair: Keith Murphy
Senior Director, R&D Business Technology, *Pfizer*; Technical Meeting Chair, *PRISME Forum*

Anthony Philippakis
Chief Data Officer, *Broad Institute*

Anthony Philippakis is the Chief Data Officer of the Broad Institute of MIT and Harvard, where he is also an institute scientist.

Dr. Philippakis is committed to bridging the gap between data sciences and medicine. He is a cardiologist at Brigham and Women's Hospital, where his primary focus is caring for patients with rare genetic cardiovascular diseases. At the Broad Institute he directs the Data Sciences Platform, an organization of over 100 software engineers and computational biologists that develops software for analyzing genomic and clinical data. In addition to his roles at the Broad Institute and Brigham and Women's Hospital, Dr. Philippakis is a Venture Partner at Google Ventures, focusing on machine learning, distributed computing, and genomics.

Dr. Philippakis received his M.D. from Harvard Medical School and completed a Ph.D. in biophysics at Harvard. As an undergraduate, he studied mathematics at Yale University, and later completed the Part III (equivalent to M.Phil) in mathematics at Cambridge University.

Precision Medicine and Targeted Marketing - A Medical Doctor's Perspective

Michael Shanler
VP, Research, *Gartner*

Michael Shanler is an industry Analyst at Gartner with a focus on Life Science R&D IT, laboratories, and emerging technologies.

Prior to Gartner, his experiences include R&D IT, informatics, pre-clinical, automation, laboratories, contract research, regulatory, and engineering at Pfizer (formerly Genetics Institute) and BD Biosciences.

A Technology Consultant's Perspective

SESSION II
Shark Tank aka Dragon's Den Session

PRISME Forum Shark Tank Evaluation Panel Members:

Klaus Hofenbitzer (co-chair), Senior Director, Enterprise Architecture, *Celgene*

Klaus Hofenbitzer, PhD, joined Celgene 3 years ago as the Enterprise Architect supporting the R&D Organization. As of last year, Dr. Hofenbitzer is heading the Enterprise Business Solution Architecture department at Celgene supporting all business functions.

Prior to joining Celgene, Dr. Hofenbitzer worked at Bristol Myers Squibb as the business architect for the development organization and as a technology/strategy consultant at PA Consulting Group for 10 years supporting major BioTech and Medical Device Companies.

Munther Baara, Senior Director, Development Business Technology, *Pfizer*

Munther Baara has over 20 years of experience in the pharmaceutical industry. He is currently Sr. Director of Development Business technology at Pfizer, a worldwide pharmaceutical company.

Munther is currently the head of Clinical Paradigm within the WRD-BT Development at Pfizer, Munther is spearheading initiatives driving innovation in development operations to align with the paradigm shift in the clinical trials execution model and emerging technologies.

Munther led the Clinical Aggregation Layer (CAL) implementation of a high-profile, large-scale clinical private cloud of clinical and operational data. In addition, he has extensive experience in application and system strategies, best practices, and standards that work for clinical and enterprise architecture, information management, workflow/process automation and integration of both home-grown and commercial applications across mixed platforms.

Heather Bell, Senior Vice President, Global Head of Digital and Analytics, *Sanofi*

Heather Bell is SVP, Global Head of Digital and Analytics at Sanofi and is based in Boston. She works with colleagues across the company to implement, and further develop, Sanofi's digital strategy. Heather joined Sanofi in 2014 as VP Corporate Strategy and Emerging Opportunities and worked with the company's new leadership to develop Sanofi's 2020 strategic roadmap.

Heather joined Sanofi from AstraZeneca, where she was VP Corporate Strategy in London and then VP Program Management in IT/Operations in Boston. Prior to joining AZ in 2011, Heather spent four years as the first Director of International Strategy at the University of Oxford, creating and implementing strategies on postgraduate funding, international research funding, and international students.

Heather is a former partner at McKinsey & Company in London. As a member of McKinsey's healthcare practice, she advised clients on strategy and organization, working with pharmaceutical, biotech, and medical device companies and government organizations. She graduated from Harvard and did her doctorate and post-doc at Oxford.

David Sedlock, Head, Global Research IT, *Takeda Pharmaceuticals*

David Sedlock, PhD, is currently the Global Head of Research IT at Takeda, Boston, responsible for the planning, development and management of the Informatics platforms supporting the company's drug discovery and early clinical programs. This includes application development, design, deployment, integration, and support for the various systems and services used by the Research scientific staff including bioinformatics, cheminformatics, LIMS, and GLP systems.

Dr. Sedlock received his PhD in Bacteriology/Biochemistry from the University of Wisconsin, Madison, and has been working in the pharmaceutical and biotech industries for the past 25+ years both as an R&D program director and an Informatics and IT business leader managing scientific and enterprise software systems at a global level.

Ashok Upadhyay (co-chair), Global R&D IT Leader, *Otsuka Pharmaceutical Companies*

Ashok Upadhyay is responsible for leading Global R&D IT function at Otsuka Pharmaceutical Development and Commercialization Inc., a leading firm focused on developing drugs in the challenging area of mental health, neuroscience, oncology, cardio-renal, and medical devices.

Some of Mr. Upadhyay's current initiatives include improving R&D service delivery through embracing effective use of technologies, creating business services model to deliver novel and innovative cloud base business solutions to enable transformational IT capabilities to support global business growth.

Prior to joining Otsuka, Mr. Upadhyay served in various progressive IT leadership positions at large pharmaceutical, information technology outsourcing, top tier management consulting firms providing strategic consulting, product development and CxO advisory services.

The session's objective is to provide a constructive yet relaxed activity to encourage interaction between PRISME Forum members, the VC community and five start-up companies with a value proposition relevant to the context of the meeting's theme, i.e., AI in biopharma, R&D and Healthcare.

The rationale, in particular, is that:

- the PRISME Forum members get introduced earlier than they otherwise would to relevant life science R&D/healthcare AI-based business propositions.
- the VCs have an opportunity to meet members of the PRISME Forum and better understand the kinds of problems that these R&D IT leaders are facing – such that they might better identify the start-up companies with relevant business ideas.
- the start-up companies have an opportunity to interact with members of the PRISME Forum and get some constructive feedback about their business propositions.

In terms of structure, the session will begin with the co-chairs' overview followed by five 15-minunte "pitches" delivered by the five start-ups showcased below. Each of these five segments will allow the Panel to ask questions. The session will end with the co-chairs' summary and concluding notes.

Start-up #1: Precision Digital Health

Introductions: *Brooks Hill Partners*

Precision Digital Health:

Thomas Wells is CEO and Co-Founder of Precision Digital Health. He has over 20 years' experience in Life Sciences and Healthcare, specializing in product management to bring new innovative technology solutions to market for research and clinical trials.

He founded Precision Digital Health in 2015 to target next generation research technologies for real-world evidence research.

Bridging Real-World Evidence with Advanced Machine Learning

Discussion on the Industry need to transform how research is done today. A shift toward real-world evidence research and leveraging new cutting technologies is accelerating Precision Medicine today.

Start-up #2: nQ Medical

Introductions: **Eyal Geffen,** Managing Partner, *Sky Ventures*

Eyal Geffen has 17 years of demonstrated success in various management and hands on positions. He has had experience with large corporations, coupled with extensive background building and running new ventures and comprehensive knowledge of international markets. Sky Ventures Group was founded by Eyal Geffen and Dr. Raphael Nir in 2015. As a Managing Partner, Eyal is responsible for all management and day to day operations.

Previously, he held a variety of leadership positions including Co-Founder at RANDG, VP Business Development & Sales at Med-1, Business Partner Manager at HP and VP Marketing & Business Development at ThinCom.

Mr. Geffen has a BSc in Business Administration and an MBA.

nQ Medical:

Richie Bavasso is one of the early pioneers of use of digital media, devices and the web as tools to support pharmaceutical sales and marketing strategies and tactics. Since 1999, he has worked with top 25 Pharma clients globally to introduce the Closed Loop Marketing (CLM) function.
He has set procedure and precedent in the areas of sales force effectiveness, business-rule driven content management, multichannel marketing, and mobile technology.

A frequent speaker at industry conferences and events, Mr. Bavasso serves as an advocate for the industry in promoting digital conversation as integral to the various enterprise functions within pharma and the medical community.

Prior to his seven years as co-founder and President of Exploria SPS, Mr. Bavasso served for sixteen years as CEO of Pharmedica Holdings, LLC, and President of its INFLUENT Division, at the time one of the largest medical education companies in the world. He built Pharmedica holdings from its start as a meeting planning company in 1992, doubling its revenues each year until its sale in 2001. This growth included an ACCME accredited entity (Center for Medical Education, LLC), a digital content division (Influent, LLC), and a call center (ContextMedicus, LLC). He opened offices in California, Connecticut, Illinois, and North Carolina.
He is currently co-founder and CEO of nQ Medical, Inc., a machine learning computational biomarker company leveraging keyboard data to manage neuromotor diseases. Everyone has a unique typing signature. Research has

revealed that the way we interact with computers and mobile devices can reveal with startling accuracy the presence of certain neuro-motor diseases. This Massachusetts Institute of Technology discovered/Michael J. Fox Foundation validated artificial intelligence tool (neuroQWERTY) has opened a broad opportunity to better diagnose diseases, track disease progression, and monitor medication effectiveness and symptoms.

Mr. Bavasso is also a licensed hospital administrator having served from 1981 to 1992 leading two health care systems in New England. A graduate of Pepperdine University, Malibu, CA, with a Bachelor of Science degree in business administration, he received his MBA in health care management and finance from Bryant University, Smithfield, RI.

Transforming Medicine through AI

NQ Medical's machine learning algorithms (licensed from MIT after four years of research and validation) analyze user interaction with common personal electronic devices to capture functional decline related to neurocognitive, neuromotor, and neurobehavioral disorders. Using machine learning, NQ passively evaluates information collected from the daily use of personal mechanical and touchscreen devices to detect pathological signs of disease. Referred to as a "computational biomarker" there is no proprietary device required, thus adherence is near 100%.

It can be used to diagnose disease earlier than current clinical tools, track disease progression, and measure the impact of medication therapy. The mechanism has been validated to diagnosis Parkinson's, alcohol inebriation, and sleep inertia from a person's typing pattern. NQ is expanding disease applicability and are currently involved in clinical trials for Alzheimer's disease, mTBI/concussion, depression, and objective measurement of pain. This could also be the first digital marker for marijuana intoxication!

How does it work? The fine control of typing and touch screen kinematics allows for precise monitoring of small changes in neurodegeneration that frequently cannot be observed by clinicians.

Key benefits include:
- Algorithms that can detect symptoms 5-10 years before clinician diagnosis;
- 24/7 at-home/real world (anywhere) patient monitoring;
- Massively deployable on any personal device for unbiased, passive monitoring;
- No proprietary device or active testing required.

Start-up #3: Asimov

Introductions: **Mark McAndrew**, Partner, *Andreessen Horowitz*

Mark McAndrew is a partner on the enterprise business development team at Andreessen Horowitz. Mr. McAndrew has been working with a16z working with Financial services and Healthcare corporations navigate key trends in Silicon Valley and connect with a16z portfolio companies. He also supports the a16z Bio portfolio's business development efforts, advising on sales best practices and international expansion.

Mr. McAndrew graduated with a Mathematical-Economics degree from Brown University and worked at Salesforce.com before joining Andreessen Horowitz.

Asimov:

Raja Srinivas, PhD is a structural biologist, computer scientist, and biotech entrepreneur. He is a recent graduate of MIT's Biological Engineering PhD program where he invented machine learning-based tools to rationally engineer therapeutics for infectious diseases.

Concurrent with his PhD, Dr. Srinivas co-founded a biotechnology startup (Novopyxis). He is an inventor of the company's flagship products: a needle-free transdermal delivery device and a mathematically designed therapeutic for cardio-oncology. Dr. Srinivas continues to serve on the board of Novopyxis. His objective function is to computationally tame the complexity of biochemical systems.

Computer-Aided Design of Living Cells

Living cells naturally perform biochemical computation to navigate their environments, communicate with each other, and organize into spatial patterns. However, despite the ubiquity of cell computation in nature, it is virtually absent in biotechnology. Future applications in therapeutics, manufacturing, and agriculture will require cells that can precisely respond to environmental signals and cell state. To develop this capability, we built a computer-aided design platform called Cello.

Using Cello, a cell sense-and-response specification is provided as input and then the software automatically compiles this to a DNA sequence. Algorithms first construct a "genetic circuit" diagram, then assign transcription factor modules, and lastly perform biophysical simulations for the genetic system. A critical component of our platform is a library of engineered transcription factor modules that are insulated from genetic and cellular context. As a demonstration of Cello's capabilities, we used it to build the most complex cell behaviors to date. We are now focusing the Cello platform on developing commercial applications in therapeutics manufacturing and the gut microbiome.

Start-up #4: Freenome

Introductions: **Mark McAndrew**, Partner, *Andreessen Horowitz*

Freenome:

Imran S. Haque, PhD is the chief scientific officer at Freenome, supervising research and development integrating high-resolution multiparametric molecular assays with modern machine learning to develop technologies for early cancer detection and treatment. Prior to Freenome, Dr. Haque was VP Scientific Affairs at Counsyl, where he led publications and early technology development in reproductive and cancer genetics, to translate genetic datasets of 100,000s of individuals into new discoveries in population health.

He earned his PhD in Computer Science at Stanford University advised by Vijay Pande and Daphne Koller, focusing on large-scale machine learning for drug discovery, and his BS in Electrical Engineering and Computer Science at UC Berkeley.

Freenome

Freenome is a healthtech company focused on creating tools that empower people to prevent, detect, and treat their diseases, such as cancer. Through a fusion of machine learning and genomics, our team is working to reinvent disease management through early detection and intervention, with the goal of making cancer screening and diagnostics as accurate and accessible as possible.

The foundation of Freenome's approach is based on immunosurveillance in cancer. Our technology identifies patterns in cell-free DNA (cfDNA) and other analytes from immune and other non-tumor cell types found within the tumor microenvironment. This approach is enabling us to develop screening tests for several types of cancer and identify cancers at early stages.

Currently, Freenome is partnering with several pharmaceutical companies and academic institutions to explore how cell-free genomic signatures can support the discovery of new drugs and predict response to treatment, which will help people find the right interventions.

Start-up #5: Wellth

Introductions: *Beta Bridge Capital*

Wellth:

Matthew Loper is the CEO and Co-founder of Wellth. He is passionate about all things health. After receiving a BS in Biological Engineering from MIT, he headed to Wall Street, working as a healthcare investment banker at Goldman Sachs and healthcare investor at OrbiMed Advisors.

Wellth

Behavioral Economics is the study into why people make irrational decisions and can be applied to healthcare problems like "why don't patients take their medications?". Wellth is on the forefront of using behavioral economics and AI to motivate and verify patient behaviors like medication adherence. In their RCTs, pilots, and commercial implementations, they have consistently demonstrated the ability to improve baseline adherence from 50% to over 80%. When applied to clinical trial management, this level of adherence could save millions of dollars for pharma R&D by ensuring enrolled participants are retained and compliant."

SESSION III
POSTERS

Session Chair: John Apathy

VP, R&D Informatics, *Celgene*

John Apathy is the Vice President of R&D IT at Celgene Corporation. Mr. Apathy joined Celgene in 2013, leading its Global R&D Informatics efforts for the IT organization.

He brings over 25 years of experience in Pharmaceutical new product and R&D capability development across the Pharmaceutical/Biotech, Life Sciences and Management Consulting industries.

Mr. Apathy has extensive knowledge and experience based upon leadership positions within both industry and consulting at Celgene, GlaxoSmithKline, Pfizer, Wyeth, Accenture, Eli Lilly & Company, PA Consulting Group, and Solutia Pharmaceutical Advisors.

He is also an experienced leader in strategy, processes, and systems for development and commercialization of new pharmaceutical products—skills and experience include delivery of strategy, large-scale program management, product development processes, life-cycle extension, product launch (particular emphasis on the Early Development phase of Pharmaceutical R&D, combining technical knowledge with change leadership, consulting problem-solving, strategy development, and change management processes).

Ari Yacobi

Chief Data Scientist, *Knowledgent*

P1

Ari Yacobi is the Chief Data Scientist and Innovation Practice Lead at Knowledgent. Ari spends his time bringing data science to Real-World-Evidence and Outcomes Research and has successfully led RWE strategy and analytics engagements at large pharmaceutical and health insurance companies. Ari is a seasoned data science expert with multiple years of experience in leading and managing large-scale AI programs. Previously, Ari was the Lead Data Scientist and CTO at a venture-funded startup, where he led the development of predictive marketing analytics offering. He also played a key role in forming a partnership with Google, building mobile capabilities, and driving business model innovation. Ari regularly speaks at industry events and occasionally teaches data science and analytics at General Assembly. Ari holds a Bachelor of Science in Computer Engineering from Pennsylvania State University and a dual Master's degree in Engineering and Business from University of Pennsylvania, The Wharton School.

Tom Johnstone

Managing Partner, Life Sciences, *Knowledgent*

Passionate about the transformational impact that data and analytics can have on population health, Tom Johnstone has spent the entirety of his 18-year career contributing to organizations that provide information management, analytics and technology solutions to 70+ Life Sciences and Healthcare companies.

He currently leads Knowledgent's Life Sciences and Healthcare business, a team of 200 that provides data intelligence solutions to leading Pharmaceutical, Medical Device, Health Insurance Payer and Healthcare Provider companies.

P1: Smart Molecular Similarity Search

Knowledgent presenter will provide an overview of Artificial Intelligence applications they are building across R&D Value Chain and will do a deep dive into use Artificial Intelligence for smart molecular search, that incorporates analysis of molecular similarity. They will show an example analysis of: hierarchical clustering of the molecules based on their structures (illustrated by the dendrogram), clustering based on text, and additional filtering capabilities. In addition, they will also discuss technologies used enable the search at scale.

Tim Guilliams

CEO, *Healx*

P2

Tim Guilliams is a social entrepreneur passionate about delivering the next generation of therapeutics to rare disease patients in need. He is the Founder and Chief Executive of Healx and the Co-Founder and Chair of the Cambridge Rare Disease Network (CRDN), a charity aiming to foster dialogue and awareness around rare diseases in Cambridge, UK.

Prior to Healx and CRDN, Mr. Guilliams worked on University-Industry interactions in the area of Life Sciences for the UK Government Department for Business, Innovation and Skills (BIS). He obtained his PhD in the field of Biophysical Neuroscience at the University of Cambridge. He is also a Junior Associate Fellow of the Centre for Science and Policy (CSaP). Before moving to Cambridge, he obtained an MEng in Bio-Engineering from the University of Brussels (VUB).

David Brown

Chairman and CSO, *Healx*

Dr. David Brown has 40 years' experience in the pharmaceutical / biotechnology industry both in research and in senior executive roles. He served with 4 of the top 10 pharmaceutical companies: Zeneca, Pfizer, GlaxoWellcome, and Hoffman La-Roche. Whilst at Pfizer he was named co-inventor on the patent for Viagra, and for 8 years he led the team that invented and developed Viagra through to proof of clinical efficacy in male impotence. The drug is also marketed for treatment of pulmonary hypertension under the trade name Revatio. He also had a pivotal role in the discovery of Relpax, a treatment for migraine. Together these drugs have achieved sales of over $30 billion. While at Roche in Switzerland, he was a Director of the company and, as Global Head of Drug Discovery, he had responsibility for productivity of over 2000 scientists at Roche's five research sites in the USA, Europe and Asia.

Dr. Brown subsequently co-founded antibody company Crescendo Biologics and serves on the boards of Healx Ltd (Chair), ProFactor Pharma Ltd (Chair) and Babraham Institute Enterprise Ltd (Chair). He is a Trustee (Director) of two charities, Antibiotic Research UK, dedicated to solving the looming problem of antibiotic resistance; and Friends of Manjushree Vidyapith School and Orphanage, a charity he co-founded in 2005 to help destitute orphans in South Tibet.

P2: AI in Patient Stratification: From 'omics to Digital Biomarkers

'Omics and AI are game changing technologies. They will allow the transition from 'Population Medicine' to a more personalized one. However, in order to fulfil the promise of 'Personalized Medicine', novel digital tools for patient stratification and treatment allocation are required.

It is possible today to measure one's genome, transcriptome and proteome in high-level detail. Unfortunately, integrating and interpreting this multi-omic information still comes with significant challenges.

Healx Ltd, a technology startup from Cambridge University, focuses on treatment predictions for rare and genetic diseases. It developed novel computational methods based on multi-omic integration, metabolic modelling and networked-based analysis. It allows to reconstruct a genome-scale human model where every gene, pathway, metabolic reaction and flux-rate is taken into account, thereby converting human biology into a quantitative digital format. It is believed to hold great promise for the application of digital biomarkers, patient stratification and future personalized medicine.

Wei-Yi Cheng
Senior Scientist, *Roche Innovation Center New York*

P3

Wei-Yi Cheng is a senior data scientist at Roche Innovation Center New York. He specialized in integrated big data analytics with a focus on digital biomarker development for neural degenerative diseases, and drug response prediction using genomic data.

Dr. Cheng received his Ph.D. degree in Electrical Engineering from Columbia University in the City of New York, where his research focused on development of genome-scale data mining algorithms for biological discovery and predictive modeling.

P3: AI and Analytics on Smart Device Data Capture: Successful Passive Monitoring of Early-Stage Parkinson's Disease Patient Mobility in a Phase I RG7935/PRX002 Clinical Trial with Smartphone Sensors

Smartphone-based assessments have been considered a potential solution to passively monitor gait and mobility in early-stage Parkinson's disease (PD) patients. In the Multiple Ascending Dose clinical trial of PRX002/RG7935, 44 PD patients and 35 age- and gender-matched healthy individuals performed smartphone-based assessments for up to 24 weeks and up to 6 weeks respectively. For "passive monitoring", subjects carried the smartphone with them as part of their daily routine, while sensors in the smartphone recording movement data continuously. In total, over 30,000 hours of passive monitoring data were collected. To classify the sensor signal into activity profiles, we built a Human Activity Recognition (HAR) model using Deep Neural Networks (DNN) trained on previously published data. The activity profiles of the participants determined by the HAR model showed significant differences between PD patients and healthy controls in the percentage of time walking and frequency in which subjects changed positions (sitting and standing). This combination of sensor data and machine learning-based activity profiling was shown to hold great promise for use in future clinical practice and drug development.

Christopher Gibson

Co-Founder and CEO, *Recursion Pharmaceuticals*

P4

Chris Gibson, PhD, is the Co-Founder and CEO of Recursion Pharmaceuticals, a biotech company leveraging the latest in automation, artificial intelligence and biology to do drug discovery at scale. Chris developed the technology and approach underlying Recursion as part of his MD/PhD graduate work in the lab of Co-Founder Dr. Dean Li at the University of Utah. Dr. Gibson left medical school to transform this technology into the rapidly growing company it is today.

Dr. Gibson is a graduate of Rice University with degrees in bioengineering and managerial studies, as well as a graduate of an intense entrepreneurship course at Stanford GSB. He is a Board Member of CureHHT, a patient advocacy group for Hereditary Hemorrhagic Telangiectasia, and a member of the Rare and Undiagnosed Network Advisory Board.

P4: AI - Combining Biological Science with Machine Learning

At Recursion, we are augmenting phenotypic screening with artificial intelligence to dramatically improve the power of screens, the pace of discovery, and the ability to identify worrisome signals early in the discovery process. The base of our approach is to broadly probe both disease biology, and the effect of drugs on disease biology, across 1000+ dimensions of cellular morphology in an inexpensive, unbiased, and generalizable image-based assay. While this systems-based approach already affords us confidence in the translatability of our hits, our application of artificial intelligence methods to our data further increases the power of our approach - allowing us to predict toxicity signatures, novel mechanisms of action, and even hits for diseases that were never tested in the same experiment.

Our AI methods are also uniquely advantaged by a massive in-house dataset, which is constantly growing at the rate of 2M+ images of 65B+ cells per week, generated across hundreds of relatable experiments. We describe here selected applications of the Recursion technology, which has generated a pipeline of 30+ rare genetic disease programs in <2 years, rediscovered late-stage clinical assets for multiple conditions at a fraction of the cost, generated new targets in areas such as Immuno-Oncology, and increased screening efficiency by maximizing biological diversity of compound libraries. These data will demonstrate Recursion's early progress towards our mission of decoding biology to radically improve lives.

Akshay Vashist
Director - Data Sciences, *Otsuka Pharmaceutical Companies*

P5

Akshay Vashist, PhD, is Head of Data Insights and Analytics group in Otsuka Data Sciences at Otsuka. Dr. Vashist leads efforts on identifying data analytics needs across functional areas, conceiving, architecting and developing smart and secure systems to address those needs. To develop these solutions for future business models and processes, he collaborates across functional areas to accelerate innovation by bringing in horizontal technologies, such as Machine Learning, Artificial Intelligence, and Information Security, to realize Otsuka's vision for the future.

Dr. Vashist has over 15 years of experience in Data Sciences. Prior to joining Otsuka, he held Senior Research Scientist position at Applied Communication Sciences (previously known as, Telcordia/BellCore Research) where he successfully conceived and led several machine learning/AI research programs for DARPA, IARPA, and the Air Force Research Labs. His main focus is on developing algorithms for new problems in machine learning and applying them to real world problems. His research interests include machine learning, pattern recognition, rare event analysis, predictive analytics, artificial intelligent systems, information security, novel infrastructure and their applications in healthcare, pharmaceutical development, computer vision, communication networks, information security and privacy analytics. He has published more than 40 refereed papers in major conferences and journals and has several patents and won best paper awards. Akshay received his PhD in Computer Science from Rutgers University and completed a postdoc at NEC Labs with Vladimir Vapnik, the founder of Statistical Learning theory.

P5: Machine Learning to Machine Teaching: Intelligence by Design

Summary: As machine learning systems advance and become democratized across different industries, their effective use is hindered by Subject Matter Experts (SME) inability to train them effectively. SME can be great teachers by providing a variety of contextual information to train machine learning algorithms; however, current machine learning settings are limited and cannot use such deep information only at the training stage unless that information is also available during test stage. This requires a paradigm shift from machine learning to machine teaching where a SME's role in machine learning is expanded akin to a teacher's role in human learning. We propose, design, and demonstrate a new machine learning paradigm and algorithm that imitates an advanced teacher during the training stage of machine learning algorithms.

Technical Overview: Classical supervised learning aims at learning a decision rule from a given set of labeled training data, here the role of a teacher is primitive and limited to providing class labels. In human learning, however, the role of a teacher is more extensive. Teacher can provide explanations, comparisons, metaphors, and use other pedagogical tools. Motivated by this observation, our research has focused on a new direction in machine learning – to develop methods for introducing human elements of teaching into machine learning. We describe a conceptual framework to expand the role of teacher in machine learning and an algorithm to realize this framework. We modify Support Vector Machine type of algorithms to develop machine teaching algorithms.

Results: Using motivating examples from healthcare and other domains, we first show the limitation of classical supervised learning paradigm – it requires a large number of examples to yield a satisfactory performance. Then, we show how Subject Matter Expertise (teacher) that is available only during training can be used to improve performance through effective teaching on a much smaller number of examples. We demonstrate this on protein functional classification and digit recognition problems.

John Gregory

Director, Project & Portfolio Management Business Technology, *Pfizer*

P6

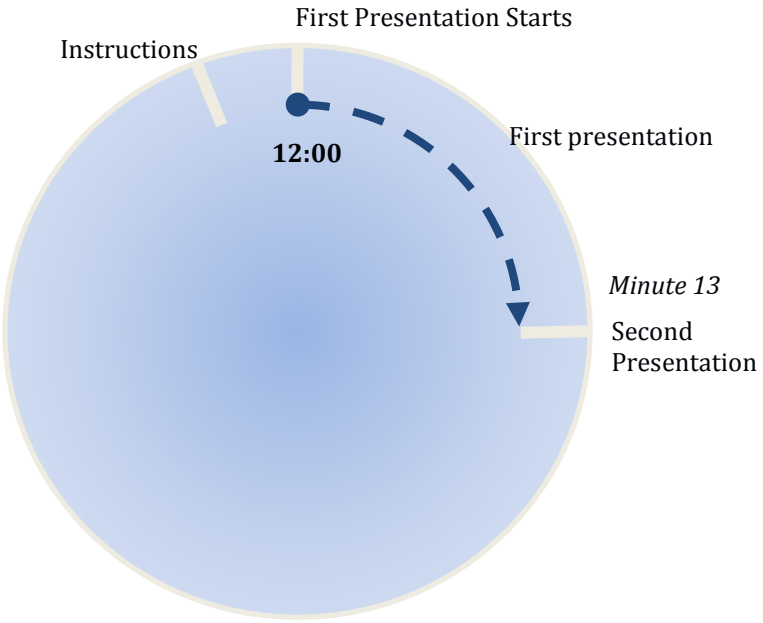
John Gregory has been at Pfizer for 17 years, and is a Director within the R&D BT organization, and leads the Project & Portfolio Management (PPM) BT group, responsible for project and portfolio management technologies across WRD and the Business Units (early discovery through post-LOE).

Mr. Gregory most recently led Pfizer's implementation of IBM Watson Drug Discovery for Immuno-Oncology.

P6: AI – Application of IBM Watson's Cognitive Computing Capabilities in Research

Learn about the steps and lessons from Pfizer's first production implementation of IBM Watson for Drug Discovery (WDD), and how WDD is to able review and help make sense of patterns in the vast sea of research publications, patents and medical journals, augmenting Pfizer's Oncology R&D and Drug Safety scientists ability to identify, and rank, promising novel immuno therapies, and help predict the viability of those therapies in terms of efficacy and toxicity

POSTER SESSION ROTATIONS



INSTRUCTIONS @11:55am

- Session Chair will invite participants to take their seats.
- Chair will open the session by introducing the presenters, their posters, along with the session structure and flow.
- PRISME Forum staff will ring the bell on each rotation (minute 13 of each presentation and then minute 15 at which time the presentation must end).
- Delegates are invited to identify the color of their lanyard and match to rotation called out by staff: "Rotation 1, 2, …n".
- Rotations will involve shift of participants' groups to the next poster on their right.

FIRST SET OF ROTATIONS:

ROTATION 1 – 12:00	ROTATION 2 – 12:15	ROTATION 3 – 12:30
P1 – Orange	P1 – Green	P1 – Yellow
P2 – Blue	P2 – Orange	P2 – Green
P3 – Red	P3 – Blue	P3 – Orange
P4 – Purple	P4 – Red	P4 – Blue
P5 – Yellow	P5 – Purple	P5 – Red
P6 – Green	P6 – Yellow	P6 – Purple

BREAK FOR LUNCH

SECOND SET OF ROTATIONS:

ROTATION 4 – 13:45	ROTATION 5 – 14:00	ROTATION 6 – 14:15
P1 – Purple	P1 – Red	P1 – Blue
P2 – Yellow	P2 – Purple	P2 – Red
P3 – Green	P3 – Yellow	P3 – Purple
P4 – Orange	P4 – Green	P4 – Yellow
P5 – Blue	P5 – Orange	P5 – Green
P6 – Red	P6 – Blue	P6 – Orange

POSTER ROTATIONS *(lanyard colors)*

ORANGE	
John Apathy	*Celgene*
Edsel David	*Astellas*
Massimo de Francesco	*UCB*
Steven Frederick	*Moderna*
Imran Haque	*Freenome*
Birgitte Mathiesen	*Novo Nordisk*
Carol Rohl	*Merck*
Alex Schuleit	*Lundbeck*
Michael Shanler	*Gartner*
Ashok Upadhyay	*Otsuka*
Thomas Wells	*Precision Digital Health*

BLUE	
Andrew Allen	*Regeneron*
Christian Baber	*Shire*
Heather Bell	*Sanofi*
Beatrice Chapuzet	*Servier*
Andreas Friese	*Bayer*
Tara Gorney	*GlaxoSmithKline*
Klaus Hofenbitzer	*Celgene*
Matthew Loper	*Wellth*
Tomoyuki Matsunaga	*Takeda*
Keith Murphy	*Pfizer*
Gary Shorter	*QuintilesIMS*

RED	
David Christie	*Amgen*
Ib Groth Clausen	*Novo Nordisk*
Eyal Geffen	*Sky Ventures*
Daniel Heighway	*Eli Lilly and Company*
Steve Howes	*Pfizer*
Martin Leach	*Alexion*
Greg Moody	*Biogen*
Achim Plueckebaum	*Novartis*
Debbie Profit	*Otsuka*
Raja Srinivas	*Asimov*
Brad Wintermute	*FDA*
Xin Zhang	*Celgene*

PURPLE	
Munther Baara	*Pfizer*
Sherry Cao	*AbbVie*
Danielle Ciofani	*Broad Institute*
Dan Chapman	*UCB*
Martin Erkens	*Roche*
Thomas Frei	*Novartis*
Olivier Gien	*Sanofi*
Bruno Larmurier	*Servier*
Michael Robbins	*Celgene*
David Sedlock	*Takeda*
Tatsuyuki Takahashi	*Mitsubishi Tanabe*

YELLOW	
Teresa Arroyo-Gallego	*nQ Medical*
Mark Borowsky	*Novartis*
Michael Cassidy	*Regeneron*
Mary Hall Gregg	*Pfizer*
Lars Greiffenberg	*AbbVie*
David Johnson	*Moderna*
Scott Oloff	*Boehringer Ingelheim*
Ludovic Otterbein	*Lundbeck*
Anthony Philippakis	*Broad Institute*
Carl Ruel	*Sunovion*
Jason Swift	*AstraZeneca*

GREEN	
Richie Bavasso	*nQ Medical*
Antoine Bril	*Servier*
Richard Corley	*Sky Ventures*
Matteo di Tommaso	*Biogen*
Joel Ekstrom	*Ionis*
Roy Ladd	*AbbVie*
Sebastien Lefebvre	*Alexion*
Jean-Luc Schmidt	*Sanofi*
Naresh Sethi	*Otsuka*
Andy Siegel	*Sanofi*
Susie Stephens	*Pfizer*
Romain Taillard	*Roche*
Dustin Tarditi	*GlaxoSmithKline*

SESSION IV
PLENARY PRESENTATIONS

Session Chair: Alex Schuleit

Senior R&D Business IT Development Manager, *Lundbeck*

Alex Schuleit, MSc Pharm, has over 18 years of Pharma experience and is currently Senior R&D Business IT Development Manager in Corporate IT at H. Lundbeck A/S. Alex has worked in academia and industry and has held a number of positions throughout H. Lundbeck, in both, management and specialized areas.

He is currently working on developing Corporate IT's model for delivering automation, robotics and data insight services to the business. Alongside, he is also Corporate IT's lead in Lundbeck's "Big Data" program focused on leveraging big data analytics across R&D, exploring mobile health technologies, real world data and artificial intelligence.

Alex is a member of the R&D IT Forum that reports to the R&D Executive Committee. The forum is responsible for the development and implementation of the R&D IT strategy, and for ensuring IT strategic alignment across R&D. He is also Corporate IT's representative in the R&D IT Architecture & Qualification Team.

Debbie Profit

VP, Information Technologies, *Otsuka Pharmaceutical Companies*

Deborah Profit has worked in pharmaceutical research and development for over two decades and is currently the Vice President, Otsuka Information Technology (OIT) at Otsuka Pharmaceuticals. In this role, Dr. Profit is responsible for the commercial, enterprise and research and development arms of the Otsuka IT organization. Dr. Profit has been employed by Otsuka for nearly seventeen years, and in her current role responsible for the executive sponsorship of creative solutions across technical, commercial and clinical development teams. Her responsibilities include coordinating engagements with external innovation companies/consultancies, promoting and further strengthening relationships with health care providers and clinical investigators, and actively leading transformational cross-functional pilots and prototypes to increase Otsuka's probability of success. Dr. Profit also plays a key leadership role in transitioning pilots and prototypes to full-scale projects to leverage solutions globally that complement the business portfolio to include digital medicine, digital health and big data platforms.

Preceding 2001, for over seven years Dr. Profit was the Director, Project Management at a top tier global Clinical Research Organization. In advance of joining industry, for over five years she worked in the community mental health setting as the Director of Research supporting the administration of clinical drug studies, federal and state grants, and collaborating with various patient advocacy groups to improve patient treatment access and improving clinical outcomes.

Dr. Profit possesses undergraduate degrees in nursing and psychology, a Master of Science in Regulatory Affairs - Drugs, Biologics and Medical Device, and a Doctorate in Leadership Studies with a concentration in Innovation and Creativity.

AI in Biopharma – A Biopharmaceutical Industry Perspective

Gary Shorter

Head of AI, R&D Solutions, *QuintilesIMS*

Gary Shorter has over 20 years working on large multi-phase global clinical trials as Lead Statistician before focusing within the IT team for the past six years on innovative solutions such as digital design and planning that capture information in a connected and integrated digital solution.

In the past few years Mr. Shorter has led the direction on Artificial Intelligence concepts that support the development of systems and platforms that learn from the digital data collected and build on those learnings to automate solutions for faster, smarter R&D Solutions.

He holds a Masters in Statistics from Sheffield Hallam University.

AI in Development

This presentation will set out how AI capabilities such as Machine Learning, Natural Language Processing, Robotic Process Automation and others can support the next generation of clinical trials.

The use of AI tools with multiple data sources including operational and real-world data will be addressed to inform key clinical development areas such as clinical trial planning including understanding commercialization value through to clinical operations with particular emphasis on making clinical trials faster, more efficient and cost effective whilst maintaining high levels of quality.

A high-level overview of some use cases and some proofs of concept of such capabilities will be presented.

SESSION V
BREAKOUT SESSION

Session Co-Chair: Massimo de Francesco

Senior Director, Head of Informatics, UCB

Session Co-Chair: Sebastien Lefebvre

Senior Director, Data Analytics & Decision Support, *Alexion Pharmaceuticals*

Sebastien Lefebvre has spent the last 2 years building the Alexion EDM, Data Analytics & Decision Support capabilities which delivered MDM, Search, Content Analytics and a cloud-based data center to enable Data Science, Genomics, BioInformatics and R&D alliances/collaborators.

Mr. Lefebvre recently joined the Alexion Data Sciences team to drive the orphan diseases data strategy & analytics with focus on delivering target landscapes for R&D Strategy and clinical asset landscapes for Business Development deal flow. Past roles include Head of Global Data Office at Biogen and Head of R&D Information Architecture practice at AstraZeneca.

Readout Chair: Lars Greiffenberg

Director, R&D IT and Translational Informatics, *AbbVie*

Lars Greiffenberg holds a MS in Biology and a PhD in Microbiology and has more than 15 years of experience in the field of integrated R&D IT solutions and translational informatics. Dr. Greiffenberg held different R&D IT management positions at Aventis Pharma and Sanofi-Aventis in Frankfurt before relocating to the Sanofi site in Toulouse, France were he was Global Head of Solution Center Translational Medicine with responsibility to manage and lead a global program to enable translational science at Sanofi.
In 2014 he joined AbbVie in Ludwigshafen (Germany) as director of R&D IT and Translational Informatics. Besides the local role to lead the discovery and development IT department, he plays a global role in enabling Translational and Knowledge Science at AbbVie.

GROUP A - Co-captains: Klaus Hofenbitzer (Celgene) and Thomas Wells (Precision Digital Health)

Danielle Ciofani (Broad Institute)
Matteo di Tommaso (Biogen)
Mark Borowsky (Novartis)
Steven Frederick (Moderna)
Christopher Gibson (Recursion Pharmaceuticals)
Lars Greiffenberg (AbbVie)
Steve Howes (Pfizer)
Carol Rohl (Merck)
Carl Ruel (Sunovion)
Jean-Luc Schmidt (Sanofi)
Andy Siegel (Sanofi)
Ari Yacobi (Knowledgent)

GROUP B - Co-captains: Munther Baara (Pfizer) and Richie Bavasso (nQ Medical)

Teresa Arroyo-Gallego (nQ Medical)
Richard Corley (Sky Ventures)
Antoine Bril (Servier)
Dan Chapman (UCB)
Béatrice Chapuzet (Servier)
Joel Ekstrom (Ionis)
Martin Erkens (Roche)
Thomas Frei (Novartis)
Sebastien Lefebvre (Alexion)
Naresh Sethi (Otsuka)
Susie Stephens (Pfizer)
Romain Taillard (Roche)
Akshay Vashist (Otsuka)

GROUP C - Co-captains: Heather Bell (Sanofi) and Raja Srinivas (Asimov)

John Apathy (Celgene)
Sherry Cao (AbbVie)
Eyal Geffen (Sky Ventures)
Mary Hall Gregg (Pfizer)
John Gregory (Pfizer)
David Johnson (Moderna)
Roy Ladd (AbbVie)
Greg Moody (Biogen)
Anthony Philippakis (Broad Institute)
Alex Schuleit (Lundbeck)
Tatsuyuki Takahashi (Mitsubishi Tanabe)
Dustin Tarditi (GSK)

GROUP D - Co-captains: David Sedlock (Takeda) and Imran Haque (Freenome)

David Brown (Healx)
Michael Cassidy (Regeneron)
David Christie (Amgen)
Ib Groth Clausen (Novo-Nordisk)
Andreas Friese (Bayer)
Olivier Gien (Sanofi)
Martin Leach (Alexion)
Tomoyuki Matsunaga (Takeda)
Keith Murphy (Pfizer)
Scott Oloff (B-I)
Ludovic Otterbein (Lundbeck)
Michael Shanler (Gartner)
Xin Zhang (Celgene)

GROUP E - Co-captains: Ashok Upadhyay (Otsuka) and Matthew Loper (Wellth)

Andrew Allen (Regeneron)
Christian Baber (Shire)
Wei-Yi Cheng (Roche)
Massimo de Francesco (UCB)
Tara Gorney (GSK)
Tim Guilliams (Healx)
Tom Johnstone (Knowledgent)
Bruno Larmurier (Servier)
Debbie Profit (Otsuka)
Michael Robbins (Celgene)
Gary Shorter (QuintilesIMS)
Jason Swift (AstraZeneca)
Brad Wintermute (FDA)

SESSION VI
MEETING SUMMARY & AWARDS

Session Chair: Keith Murphy

Senior Director, R&D Business Technology, *Pfizer*; Technical Meeting Chair, *PRISME Forum*