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Fellow CRI Summit Attendees and AMIA members,

On behalf of the Scientific Program Committee and AMIA, I am pleased to welcome you to the 4th Annual Summit on Clinical Research Informatics (CRI). The CRI Summit reflects the significant growth and rapidly changing landscape of clinical research informatics. The CRI Summit allows scientists and professionals to accomplish various goals: network, develop new collaborations, and identify potential avenues of research and development that will ultimately contribute to healthcare advancements.

As in years past, the CRI Summit immediately follows the Summit on Translational Bioinformatics (TBI) which affords participants the unique opportunity to see the latest developments in clinical research informatics from academia, industry and government. The TBI and CRI Summits serve as the primary forum for exchange of ideas, issues, and science in clinical and translational research informatics.

The CRI Scientific Program Committee designed a comprehensive scientific program with a variety of formats. In addition to the “Birds of a Feather” sessions, papers, panels and podium abstract presentations, this year we have introduced an introduction to CRI tutorial, a keynote by Dr. Eric Horvitz (Microsoft Research), several late breaking sessions, and a poster review session in which four senior informaticians review the best posters presented at the conference. CRI will wrap up with the “CRI Year in Review” by Dr. Peter Embi.

For me personally, AMIA has been my professional home and an important part of “being an informatician.” Each year, I look forward to reconnecting with my colleagues and friends from around the world. I look forward to catching up on the latest science as well as the latest news. Although I attend meetings in a variety of disciplines, I feel most at home at AMIA.

At a time when travel funding (and time) is increasingly scarce, thank you for choosing to attend the CRI Summit. I hope that you will come away from the meeting with new ideas and a new enthusiasm for clinical research informatics.

Looking forward to a great meeting,

Elmer V. Bernstam, MD, MSE
Scientific Program Committee Chair
2013 CRI Summit
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Department of Biomedical Informatics, Columbia University

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Chair, SPC CRI 2013
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AMIA 2013 ANNUAL SYMPOSIUM

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Center for Biomedical Informatics at the Regenstrief Institute
## CRI SUMMIT-AT-A-GLANCE

### WEDNESDAY, MARCH 20

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<tr>
<th>Time</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>7:00 a.m. – 8:30 a.m.</td>
<td>Coffee and Pastries</td>
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<tr>
<td>7:00 a.m. – 5:30 p.m.</td>
<td>Registration Open</td>
</tr>
<tr>
<td>7:00 a.m. – 8:15 a.m.</td>
<td>TBI-CRI Town Hall with Dr. Gilad Kuperman and Dr. Kevin Fickenscher</td>
</tr>
<tr>
<td>8:30 a.m. – 10:00 a.m.</td>
<td>CRI Opening Session and Keynote Presentation: Dr. Eric Horvitz</td>
</tr>
<tr>
<td>10:00 a.m. – 10:30 a.m.</td>
<td>Coffee Break</td>
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<tr>
<td>10:30 a.m. – 12:00 p.m.</td>
<td>Scientific Sessions</td>
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<tr>
<td></td>
<td><em>CRI-01: EMR Text Processing/Phenotyping 1</em></td>
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<td><em>CRI-02: Integrating Governance of Research Informatics and Healthcare IT across an Enterprise: Experiences from the Trenches</em></td>
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<td><em>TBI-14: Alternative Careers for Biomedical Informatics PhDs</em></td>
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<tr>
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<td><em>TBI-15: Electronic Health Record Data Mining</em></td>
</tr>
<tr>
<td>12:15 p.m. – 1:15 p.m.</td>
<td>Lunch &amp; Learn - Velos</td>
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<tr>
<td>1:30 p.m. – 3:00 p.m.</td>
<td>Scientific Sessions</td>
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<tr>
<td></td>
<td><em>CRI-03: Silver Medallion Poster Framing Preview</em></td>
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<tr>
<td></td>
<td><em>CRI-04: EMR Text Processing/Phenotyping 2</em></td>
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<td><em>TBI-16: TBI in Oncology</em></td>
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<td><em>TBI-17: Pharmacogenomics Decision Support</em></td>
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<tr>
<td>3:30 p.m. – 5:00 p.m.</td>
<td>TBI Closing Session and TBI Year in Review: Dr. Russ Altman</td>
</tr>
<tr>
<td>5:00 p.m. – 6:00 p.m.</td>
<td>CRI Poster Session I and Reception</td>
</tr>
<tr>
<td>6:00 p.m. – 7:30 p.m.</td>
<td>Natural Language Processing Working Group Business Meeting</td>
</tr>
<tr>
<td>6:00 p.m. – 8:00 p.m.</td>
<td>i2b2 Academic user’s Group (AUG) Workshop (Affiliate Event)</td>
</tr>
<tr>
<td>6:00 p.m. – 9:00 p.m.</td>
<td>The Ohio State University Red &amp; Grey Reception (Affiliate Event) by invitation</td>
</tr>
</tbody>
</table>
THURSDAY, MARCH 21

7:00 a.m. – 8:30 a.m.  Birds-of-a-Feather Sessions
  CRI-BOF-01: Data Management and Coordinating Centers
  CRI-BOF-02: Research Use of EHR/Clinical Data
  CRI-BOF-03: Defining Workflows in Investigator-initiated Clinical Trials

7:00 a.m. – 8:30 a.m.  Coffee and Pastries

7:00 a.m. – 5:30 p.m.  Registration Open

8:30 a.m. – 10:00 a.m.  Scientific Sessions
  CRI-05: Next-generation Registries: Fusion of Data for Care and Research
  CRI-06: Clinical Care
  CRI-07: Privacy/Security

10:00 a.m. – 10:30 a.m.  Coffee Break

10:30 a.m. – 12:00 p.m.  Scientific Sessions
  CRI-08: Pains and Palliation in Distributed Research Networks: Lessons from the Field
  CRI-09: Ontology 1
  CRI-10: EMR Text Processing/Phenotyping 3
  CRI-LB01: Sustaining the Digital Research Enterprise

12:15 p.m. – 1:15 p.m.  Lunch & Learn - Recombinant Data

1:30 – 3:00 p.m.  Scientific Sessions
  CRI-11: Tools for Identifying Reliable Evidence and Implementing it in Everyday Clinical Care
  CRI-12: Infrastructure 1
  CRI-13: Policy/Clinical Trials
  CRI-14: i2b2/CDR

3:00 p.m. – 3:30 p.m.  Coffee Break

3:30 p.m. – 5:00 p.m.  Scientific Sessions
  CRI-15: Standard-based Integration Profiles for Clinical Research and Patient Safety
  CRI-16: Ontology 2
  CRI-17: Infrastructure 2

5:00 p.m. – 6:00 p.m.  Poster Session II and Reception

6:00 p.m. – 7:30 p.m.  Clinical Research Informatics Working Group Business Meeting
## FRIDAY, MARCH 22

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>7:00 a.m. – 8:30 a.m.</td>
<td>Coffee and Pastries</td>
</tr>
<tr>
<td>7:00 a.m. – 8:30 a.m.</td>
<td>Birds of a Feather Session</td>
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<tr>
<td></td>
<td>CRI-BOF-04: Electronic Data Capture (EDC) and Electronic Case Report Forms in Clinical Trials</td>
</tr>
<tr>
<td></td>
<td>CRI-BOF-05: Organizational Leadership around CRI, Including CRI Role Definitions</td>
</tr>
<tr>
<td>7:00 a.m. – 11:00 a.m.</td>
<td>Registration Open</td>
</tr>
<tr>
<td>8:30 a.m. – 10:00 a.m.</td>
<td>Scientific Sessions</td>
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<tr>
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<td>CRI-18: A Comprehensive Framework for Data Quality Assessment in CER</td>
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<tr>
<td></td>
<td>CRI-19: EMR Text Processing/Phenotyping 4</td>
</tr>
<tr>
<td></td>
<td>CRI-20: Ontologies 3</td>
</tr>
<tr>
<td>10:00 a.m. – 10:30 a.m.</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>10:30 a.m. – 12:00 p.m.</td>
<td>CRI Closing Session and CRI Year in Review: Dr. Peter Embi</td>
</tr>
</tbody>
</table>
This year, AMIA offers another stellar Joint Summits on Translational Science, TBI-CRI, March 18 – 22, San Francisco. TBI was the first significant meeting AMIA had created to serve the ever growing population of academicians and researchers interested in translational bioinformatics. Back then, we didn’t know exactly how the role of genomics in personalized medicine would accelerate. Shortly thereafter we added CRI which coincided roughly with the advent of the United States National Institutes of Health calling informatics a compulsory component of their burgeoning CTSA program. We didn’t know that big data and EHR would be central to clinical research informatics in quite the way it is now.

Each year the Joint Summits has been more successful. The meeting AMIA created serves a unique audience and many valued AMIA members and features highly specialized content and top speakers. This year’s program was expertly conceptualized and designed by the Scientific Program Committee, led by Chairs, Jessica D. Tenenbaum, PhD (TBI) and Elmer V. Bernstam, MD, MSE (CRI).

That AMIA can be the professional home for informaticians in translational bioinformatics, clinical research, applied clinical, consumer health, and public health informatics is a remarkably rich accomplishment. While we are far from perfect in serving the unique needs of very different constituencies, our actively engaged members push us to make AMIA and informatics even more influential. What makes AMIA a place for leaders and leadership is our ability to weave together our interconnected, multidisciplinary threads.

AMIA is on a growth trajectory—not by abandoning our traditional strengths in academic research, but by planting roots in that solid foundation and branching outward to embrace the full range of possibility for informaticians across the multidisciplinary spectrum of biomedical informatics.

I welcome your comments, questions and concerns about the future of AMIA. An engaged membership is the lifeblood of the organization! Join us at the Town Hall and speak up or email your thoughts to feedback@amia.org.

Kevin
Kevin M. Fickenscher, MD
President and CEO, AMIA
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<th>Institution</th>
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<tbody>
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<td>Dominik Aronsky</td>
<td>Director</td>
<td>Vanderbilt University</td>
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<td>Martha Bennett Adams</td>
<td>Director</td>
<td>Duke University School of Medicine</td>
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<td>Helen Burstin</td>
<td>Director</td>
<td>National Quality Forum</td>
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<td>Director</td>
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<td>University of Wisconsin – Madison</td>
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<td>Thomas H. Payne</td>
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<td>University of Texas Health Science Center at Houston</td>
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<td>Justin B. Starren</td>
<td>Director</td>
<td>Northwestern University Biomedical Informatics Center</td>
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<td>Director</td>
<td>Department of Defense/Department of Veterans Affairs Interagency Program Office (DoD/VA IPO)</td>
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<tr>
<th>Role</th>
<th>Name</th>
<th>Institution</th>
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</thead>
<tbody>
<tr>
<td>American College of Medical Informatics President</td>
<td>Alexa T. McCray, PhD, FACMI</td>
<td>Harvard Medical School</td>
</tr>
<tr>
<td>Student WG Representative</td>
<td>Paulina S. Sockolow, DrPH, MS, MBA</td>
<td>Drexel University</td>
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</table>
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Faculty and planners who refuse to disclose relevant financial relationships will be disqualified from participating in the CME activity. For an individual with no relevant financial relationship(s), the participants must be informed that no conflicts of interest or financial relationship(s) exist.

LEARNING OBJECTIVES
- To present the state-of-the-art in biomedical informatics approaches, theories, and methods relevant to clinical and translational sciences
- To present the latest research and development findings on using informatics approaches to improve clinical and translational biomedical research
- To demonstrate frameworks for deploying and assessing clinical research informatics initiatives
- To explore interactions among professionals engaged in clinical and translational science including clinical and translational investigators, computational biologists, genomics researchers, statistical geneticists, clinical informaticians, public health professionals, and those involved with clinical and research IT policy and regulatory issues
- To provide a platform to discuss research-related issues among the national and international clinical and translational research informatics initiatives, such as CTSA, caBIG, CDISC, etc.

TARGET AUDIENCE
- Bioinformaticians, statistical geneticists, molecular biologists, with interests in informatics applied to research on human subjects or material/data of human origin (i.e. clinical research)
- Biomedical and health informatics researchers and faculty
- Clinical investigators with an interest in biomedical informatics as it applies to clinical and translational research
- Community health advocates and those working to advance community-based research
- Computer scientists and system developers
- Computational biologists with interests in human disease
- Government officials and policy makers concerned with health, healthcare and/or biomedical research
- Health information and knowledge management professionals
- Health IT industry professionals and consultants
- Industry representatives related to clinical research and translational research
- Physicians, nurses, dentists, pharmacists and other clinicians
- Public health practitioners or informaticians, consumer advocates and disease management specialists
- Staff members and researchers implementing the informatics components of Clinical and Translational Science Award (CTSA)
- Standards developers

For information on how to claim your credits, please go to http://www.amia.org/jointsummits2013/cme
THURSDAY, MARCH 21  |  10:30 a.m. – 12:00 p.m.  |  Room: Mission

CRI-LB01: Late Breaking Session - Sustaining the Digital Research Enterprise

E. Berner, University of Alabama, Birmingham; R. Zottola, University of Massachusetts; W. Barnett, Indiana University; R. Waitman, KU Medical Center; R. Riley, Association of Academic Health Sciences Libraries

In October 2011, the Association of American Medical Colleges (AAMC) along with the Association of Academic Health Sciences Libraries (AAHSL) and the National Library of Medicine (NLM) hosted the Sustaining the Digital Research Enterprise Summit to identify infrastructures and strategies needed to support the digital research enterprise today and into the future. A task force was created from this summit to address four priority needs:

- Mechanisms to identify and share standards for data management and governance
- Practices for designing and developing new infrastructures at scale
- Strategies and resources to cultivate a digitally literate workforce
- Approaches for national, state, and local advocacy to inform policy and funding

Working with its members and partner organizations the AAMC will create and maintain a stakeholder network to assist member organizations with planning, implementing, managing and sustaining the digital research enterprise. Digital resources are a key area of growth and expense for academic health centers in the next decade, and proactive planning is critical. Services provided through this network will include operational benchmarks, progression growth models, policy and governance resources. The network will also facilitate adoption and development of data standards and ontologies through communities of practice. Following presentations, the panel seeks the audience’s participation regarding how our community can address these challenges. No single institution has the capacity to solve this problem alone, but as a community of professionals motivated by mutual self-interest, we collectively have the potential to move research, education, and care forward through the digital deluge.

build trust? Where does nature end and intellectual property begin? How are parallel efforts on the consumer market disrupting usual clinical care? These questions must be addressed by researchers and society alike if we are to harness the power of genomic and large-scale clinical data capabilities in ways that are trustworthy and impactful. In this panel, legal, social, and ethics scholars will speak to issues of data sharing, community engagement, returning results, gene patenting and ownership, and direct-to-consumer movements. Each member of the panel consults actively on large-scale data-driven research projects and is at the front lines of shaping governance processes that will facilitate, rather than hinder, our ability to utilize big data to impact health. In order for the best technology and science in the world to come to bear on human health issues, partners across clinical groups, researchers, policymakers, and society at large must be engaged. This panel discussion will frame emerging issues in the field with researchers and advance further stakeholder engagement.
**WEDNESDAY, MARCH 20, 2013**
8:30 a.m. – 10:00 a.m.  |  Room: Cyril Magnin I/II

**ERIC HORVITZ, MD, PhD**
*Deputy Managing Director at Microsoft Research*

Dr. Horvitz is interested in principles of sensing, learning, and decision making under uncertainty. His interests include computational models of perception, reflection, and action. Beyond theoretical models, he pursues the development and fielding of applications in several realms, including time-critical decisions, information retrieval, healthcare, urban infrastructure, sustainability, and development— with goals of understanding how computational models perform amidst real-world complexities, and of deploying systems that deliver value to people and society.

Related interests include machine learning and decision making for crowdsourcing and human computation, information triage and alerting that takes human attention into consideration, spanning work on notification systems, surprise modeling, multitasking, and psychological studies of interruption and recovery. Other interests include principles of mixed-initiative interaction that can support fluid, efficient collaborations between people and computing systems, methods for guiding computer actions in accordance with the preferences of people, search and information retrieval, and collaboration.

Theoretical research interests include offline and real-time optimization of the expected value of computational systems under limited and varying resources. Areas of concentration in this realm include flexible or anytime computation, ideal metareasoning for guiding computation, compilation for reducing real-time deliberation, ongoing, continual computation, and the construction of bounded-optimal reasoning systems—systems that maximize the expected utility of the people they serve, given the expected costs of reasoning, the problems encountered over time, and assertions about a system’s constitution. Research in this arena includes tackling hard reasoning problems with learning and decision making methods.
WEDNESDAY, MARCH 20, 2013
3:30 p.m. – 5:00 p.m.  |  Room: Cyril Magnin I/II

RUSS B. ALTMAN, MD, PhD
Kenneth Fong Professor of Bioengineering and Genetics, Stanford University

Dr. Altman is also a Professor of Medicine & (by courtesy) Computer Science and Director, Biomedical Informatics Training Program Stanford University. He focuses on the creation and application of computational tools to solve problems in biology and medicine. Current application projects include the study of structure-function relationships in macromolecular structure, understanding the structure and folding of RNA molecules, and analyzing the relationship of genotype and phenotype, particularly with respect to the response to drugs. Techniques used include knowledge representation, database design, machine learning, natural language processing, physics-based simulation and graph-based modeling/analysis.

FRIDAY, MARCH 22, 2013
10:30 a.m. — 12:00 p.m.  |  Room: Cyril Magnin I/II

PETER J. EMBI, MD, MS, FACMI
Associate Professor, Rheumatology & Immunology Biomedical Informatics, The Ohio State University

Dr. Eambi joined the Medical Center in 2010 from the University of Cincinnati Academic Health Center where he was Associate Professor of Clinical Medicine and Director of Biomedical Informatics in the Center for Clinical and Translational Science and Training. He has served as an adjunct assistant professor in Ohio State’s Department of Biomedical Informatics since 2008. He is also the founding director of the Center for Health Informatics at the University of Cincinnati Academic Health Center.

Dr. Eambi is an internationally recognized researcher and educator in the field of clinical research informatics, with numerous publications and presentations describing his innovations in the field. Dr. Eambi has received numerous awards for his distinguished work in rheumatology including the 2008 Association of Rheumatology Health Professionals President’s Award. He currently serves on the American College of Rheumatology’s board of directors. In 2008 he was elected as a fellow in the American College of Physicians.

Dr. Eambi received his medical degree from the University of South Florida, his Master of Science degree in Medical Informatics and Clinical Epidemiology from Oregon Health & Science University (OHSU) and his undergraduate degree from the University of Florida. He completed his internal medicine residency, chief residency and biomedical informatics fellowship at OHSU, and a fellowship in rheumatology at the Cleveland Clinic Foundation. He served on the OHSU faculty for two years before joining the University of Cincinnati in 2004.
SILVER MEDALLION CRI POSTER FRAMING

AMIA members with 20+ years of membership earn a Silver Medallion pin for loyalty and dedication to the AMIA mission.

WEDNESDAY, MARCH 20
10:30 a.m. – 12:00 p.m.  
Room: Mission

New this year, 120 posters are included in the CRI Poster Session. So many posters, so little time! This novel session will feature a selection of top posters as presented, contextualized, and discussed by some of the most distinguished researchers and AMIA members in the field of Clinical Research.

JAMES CIMINO, MD, FACMI  
Chief, Laboratory for Informatics Development, National Institutes of Health Clinical Center

W. ED HAMMOND, PhD, FACMI, FAIMBE, FIMIA, FHL7  
Director, Duke Center for Health Informatics, Duke Translational Medicine Institute

MICHAEL G. KAHN, MD, PhD, FACMI  
Associate Professor of Epidemiology in the Department of Pediatrics at the University of Colorado Denver

KENNETH D. MANDL, MD, MPH, FACMI  
Director, Intelligent Health Laboratory, Boston Children's Hospital Informatics Program at Harvard-MIT Health Sciences and Technology; Associate Professor, Harvard Medical School

WEDNESDAY, MARCH 20 | 5:00 p.m. – 6:00 p.m.

CRI Poster Session I and Reception  
Room: Cyril Magnin Foyer

(See page 22 GREEN for list of CRI posters, listed alpha order by first author.)

THURSDAY, MARCH 21 | 5:00 p.m. – 6:00 p.m.

CRI Poster Session II and Reception  
Room: Cyril Magnin Foyer

(See page 34 GREEN for list of CRI posters, listed alpha order by first author.)
(See page 14 YELLOW for information on Silver Medallion TBI Poster Framing.)
TUESDAY, MARCH 19  TBI
12:15 p.m. – 1:15 p.m.  |  Room: Cyril Magnin III

Translational Research Center: A Data Management Platform to Support Value Based, Personalized Medicine

This presentation will focus on the new analytics solutions that will be required to provide a scalable, secure platform for personalized medicine that accelerates biomarker discovery, validation and ultimately decision making at the point of care. This session will also discuss the challenges associated with integrating cross platform ‘omics’ data in a manner that scales to thousands of whole genome sequences whilst integrating with longitudinal clinical data from EMRs, case reports, registries and other "real world” data sources to provide an integrated view across genotype and phenotype. Specifically, Oracle will demonstrate its Translational Research Center (TRC) platform that is being implemented by many of the world’s leading academic medical centers, integrated delivery networks and cancer centers to answer the “hard questions” in healthcare – what works, for whom, why, in what context and at what cost?

WEDNESDAY, MARCH 20  TBI-CRI Bridge Day
12:15 p.m. – 1:15 p.m.  |  Room: Cyril Magnin III

Clinical Data Management for Adverse Events: tracking and reporting of events based on Common Toxicity Criteria and Graft-Versus-Host Disease grading standards—using mobile solutions from Velos.

This session will demonstrate Velos’ point of care solution for the management of AEs, aGVHDS, and cGVHDS using Common Toxicity Criteria for Adverse Events (CTCAE) and the NIH Criteria. Velos’ search and report engines that enable users with limited IT knowledge to quickly generate custom reports on data stored in Velos eResearch. Planned use in a study will be demonstrated.

Velos’ trusted Internet-based platform provides research teams with secure and compliant ways of managing clinical research and specialized medical records. With deep investments in R&D, we strive to continually improve our offerings, in order to help our customers reduce costs, increase efficiency and ultimately provide better patient care. Contact: Alex Pike, Business Analyst, apike@velos.com

THURSDAY MARCH 21  CRI
12:15 p.m. – 1:15 p.m.  |  Room: Cyril Magnin III

Michael Kahn, MD, PhD, Associate Professor, Department of Pediatrics, University of Colorado, and Director of Clinical Informatics in the Department of Quality & Patient Safety at The Children’s Hospital, Denver.

Dr. Kahn will be speaking on his choice of OMOP, the Observational Medical Outcomes Partnership, for the data model and tools used to implement the open source ROSITA server for the SAFTINet project, and the role that Recombinant by Deloitte has played in implementing ROSITA.

Lisa M. Schilling, MD, MSPH, Associate Professor of Medicine, Division of General Internal Medicine, University of Colorado Health Sciences Center; Director, Evidence-based Medicine and Medical Informatics Curriculum, School of Medicine; and Director, Scalable Architecture for Federated Therapeutic Inquiries Network (SAFTINet).

Dr. Schilling is the Principle Investigator, SAFTINet, the AHRQ funded effort that is using the OMOP software.
Birds-of-a Feather sessions are informal sessions for professionals to mingle and share experiences.

(See page 16 YELLOW for information about TBI Birds-of-a-Feather Sessions.)

THURSDAY, MARCH 21  |  7:00 a.m. – 8:30 a.m.

**CRI-BOF-01: Data Management and Coordinating Centers**

*J. Bonner, Michigan State University*

Participants will discuss common and emergent informatics issues related to the management, staffing, leadership, and strategic planning of data management and coordinating centers (for multi-site studies or research networks.) This session will build up topics from BOF sessions and posters from past CRI summits.

**CRI-BOF-02: Research Use of EHR/Clinical Data**

*B. Delaney, Kings College; A. Das, Dartmouth; S. Liaw, University of New South Wales*

This session will explore the use of EHR to support research. The particular focus will be Patient registries - looking at reliability and accuracy of deriving registers from EHR and assessing/managing the quality of the associated information so that it is fit for purpose.

**CRI-BOF-03: Defining Workflows in Investigator-initiated Clinical Trials**

*B. LaSalle, University of Utah*

Participants will discuss and articulate common workflows in the lifecycle of investigator initiated research, including: pre-clinical activity (e.g., study design, contracts, regulatory, & training), trial conduct (e.g., recruitment, enrollment, randomization, unblinding, safety issues, biospecimen collection, termination), and post-trial (e.g., data verification, validation, data sets, analysis, statistical analysis plan, CONSORT). In addition, participants will identify informatics issues during this life cycle, including what can be generalized or standardized for use in future trials.

FRIDAY, MARCH 22  |  7:00 a.m. – 8:30 a.m.

**CRI-BOF-04: Electronic Data Capture (EDC) and Electronic Case Report Forms in Clinical Trials**

*V. Huser, NIH; J. Bonner, Michigan State University*

In this session we will 1.) Solicit requirements for an EDC system (e.g., Redcap) from research informaticians, 2.) Identify and discuss standards they consider relevant, and 3.) Describe their existing systems (commercial, open source, or home grown). This discussion will lead to a qualitative paper about the current state of the art in EDC systems for CRI.

**CRI-BOF-05: Organizational Leadership around CRI, Including CRI Role Definitions**

*P. Embi, The Ohio State University*

This session will revisit topics from last year’s BOF, and explore various approaches to organizational leadership around CRI, including emerging roles and the definition of CRIO positions at multiple institutions.
MEETINGS/SOCIAL

JILLIAN’S BILLIARDS CLUB
TUESDAY, MARCH 19
Time: 6:30 p.m. – 8:30 p.m.

Tickets: Free for Joint Summits registrants. Includes one complimentary drink ticket and heavy hors d’oeuvres.

Guest tickets may be purchased for $50 at the Joint Summits registration desk.

Socialize and enjoy an evening out with colleagues. Fun, food and FREE entrance for Joint Summits registrants!

Jillian’s Billiards Club is warm and welcoming. The Billiards rooms offer a relaxed lounge atmosphere, with plush chairs and sofas, the vibe is easy going, laid back, and most of all fun!

Location: 175 4th Street, San Francisco. Transportation on your own. Located near the Parc 55 Hotel.

WEDNESDAY, MARCH 20
6:00 p.m. – 9:30 p.m.

The Ohio State University Red & Grey Reception (Affiliate Event) by invitation
Room: Cyril Magnin III

MEETINGS

TUESDAY, MARCH 19
6:30 p.m. – 8:00 p.m.

tranSMART Community Meeting (Affiliate Event)
Room: Mission

Want to know more about tranSMART? Come learn about the Open Source and Community-Driven Informatics and Data Sharing Platform for Clinical and Translational Research. Updates on major projects and the tranSMART roadmap will be presented. Connect with newbie and veteran members of the tranSMART community.

WEDNESDAY, MARCH 20
6:00 p.m. – 7:30 p.m.

Natural Language Processing Working Group Business Meeting
Room: Balboa

6:30 p.m. – 8:00 p.m.

i2b2 Academic Users’ Group (AUG) Workshop
Room: Mission

THURSDAY, MARCH 21
6:00 p.m. – 7:30 p.m.

Clinical Research Informatics Working Group Business Meeting
Room: Cyril Magnin I
DAILY SCHEDULE
WEDNESDAY, MARCH 20

7:00 a.m. – 8:30 a.m.  Coffee and Pastries  Room: Cyril Magnin Foyer

7:00 a.m. – 8:15 a.m.  TBI-CRI AMIA Town Hall  Room: Cyril Magnin III

How Can AMIA Best Support the Goals of Translational Bioinformatics and Clinical Research Informatics?

As AMIA grows, the informatics tent grows larger to include the spectrum of domains from translational bioinformatics and clinical research informatics to applied clinical and operational informatics. Members throughout the community have expressed interest in a strategic vision that is rooted in the core research and science interests and also includes expanded outreach and services for applied clinical informaticians.

Join Gilad Kuperman, AMIA Board Chair, and Kevin M. Fickenscher, AMIA President and CEO, for an open Town Hall event with Q&A. The AMIA leadership is listening and welcomes full attendance at this session. Topics will include work of the Board of Directors, new and continuing initiatives, and an update on AMIA's strategic directions.

8:30 a.m. – 10:00 a.m.  CRI Opening Session and Keynote Presentation  Room: Cyril Magnin I/II

ERIC HORVITZ, MD, PHD
Deputy Managing Director at Microsoft Research

(See page 12 GREEN for description.)

10:00 a.m. – 10:30 a.m.  Coffee Break  Room: Cyril Magnin Foyer

10:30 a.m. – 12:00 p.m.  Scientific Sessions  Room: Cyril Magnin III

CRI-01: Papers/Podium Presentations - EMR Text Processing/Phenotyping 1
Session Chair: Hua Xu

Learning Drug-drug Interactions from the Unstructured Text of Electronic Health Records
S. Iyer, P. LePendu, R. Harpaz, A. Bauer-Mehren, N. Shah, Stanford University

S. Meystre, University of Utah; O. Ferrandez, Nuance Communications Inc.; B. South, VA Salt Lake City Health Care; S. Shen, M. Samore, University of Utah

Extracting Computational and Semantic Features from Portable Chest X-rays for Diagnosis of Acute Respiratory Distress Syndrome
H. Fan-Minogue, D. Maslove, Stanford University; P. Lamb, Biomedical Image Analysis Lab; J. Levitt, D. Paik, D. Rubin, Stanford University

Automated Tools for Phenotype Extraction from Medical Records
M. Yetisgen-Yildiz, C. Bejan, University of Washington; L. Vanderwende, Microsoft Research; F. Xia, H. Evans, M. Wurfel, University of Washington
CRI-02: Panel - Integrating Governance of Research Informatics and Healthcare IT across an Enterprise: Experiences from the Trenches

P. Embi, The Ohio State University; U. Tachinardi, UW-Madison; Y. Lussier, University of Illinois at Chicago; J. Starren, Northwestern University; J. Silverstein, NorthShore University HealthSystem

Advances in health information technology and biomedical informatics have laid the groundwork for significant improvements in healthcare and biomedical research. For instance, Electronic Health Records can help improve the delivery of evidence-based care, enhance quality, and contribute to discoveries and evidence generation. Despite this promise, there are many challenges to achieving the vision and missions of our healthcare and research enterprises. Given the challenges inherent in doing so, institutions are increasingly moving to establish dedicated leadership and governance models charged with designing, deploying and leveraging various information resources to advance research and advance care activities at AHCs. Some institutions have even created a new leadership position to oversee such activities, such as the Chief Research Information Officer. This panel will include research informatics leaders discussing their experiences from the proverbial trenches as they work to operationalize such cross-mission governance models. Panelists will start by providing an overview their respective positions and environments, discuss their experiences, and share lessons learned through their work at the intersection of clinical and translational research informatics and Health IT.

TBI-14: Panel - Alternative Careers for Biomedical Informatics PhDs

J. Tenenbaum, Duke University; M. Sorani, Genentech; M. Baker, Nature Publishing Group; A. Torrance, Kansas University; E. Horvitz, Microsoft Research

The number of doctoral training programs in informatics increases every year, however not every doctoral candidate wishes to pursue a traditional career in academia. In addition, the knowledge and skills acquired through scientific training at the doctoral level can be valuable, even critical, for a number of career paths outside of academic research and teaching. This panel will present a diverse set of alternative career paths for which graduates of Informatics programs would be well suited, including patent law, research in industry, academic administration, and scientific journalism. Panelists will describe their own respective backgrounds and career paths, a day in the life in their current position, and how their training prepared them for their jobs. They will also touch on insights gained and lessons learned in exploring the professional landscape through non-traditional paths.

TBI-15: Papers/Podium Presentations - Electronic Health Record Data Mining

Session Chair: Joshua Denny

Automated Detection of Systematic Off-label Drug Use in Free Text of Electronic Medical Records
K. Jung, P. LePendu, N. Shah, Stanford University

Scalable Data-driven Phenotypes via Unsupervised Feature Learning
T. Lasko, J. Denny, M. Levy, Vanderbilt University Medical Center

Evaluation Considerations for EHR-based Phenotyping Algorithms: A Case Study for Drug-induced Liver Injury
C. Overby, C. Weng, K. Haerian, A. Perotte, C. Friedman, G. Hripcsak, Columbia University

From EHRs to Linked Data: Representing and Mining Encounter Data for Clinical Expertise Evaluation
C. Torniai, S. Essaid, Oregon Health & Science University; C. Barnes, University of Florida; J. Hajagos, E. Bremer, Stony Brook University; J. Corson-Rikert, Cornell University; M. Haendel, Oregon Health & Sciences University

12:15 p.m. – 1:15 p.m. Lunch & Learn

Clinical Data Management for Adverse Events: tracking and reporting of events based on Common Toxicity Criteria and Graft-Versus-Host Disease grading standards—using mobile solutions from Velos.
(See page 15 GREEN for description.)
1:30 p.m.–3:00 p.m.  Scientific Sessions

**CRI-03: Silver Medallion CRI Poster Review**
Room: Mission

J. Cimino, National Institutes of Health Clinical Centers; W. Hammond, Duke Center for Health Informatics; M. Kahn, University of Colorado; K. Mandl, Boston Children's Hospital

Silver Medallion CRI Poster Review is new this year and 120 posters are included in the CRI Poster Session. So many posters, so little time! This novel session will feature a selection of top posters as presented, contextualized, and discussed by some of the most distinguished researchers and AMIA members in the field of Clinical Research.

*(See page 22 GREEN and 34 GREEN for list of posters, listed alpha order by first author.)*

**CRI-04: Papers/Podium Presentations - EMR Texting/Phenotyping 2**
Room: Cyril Magnin III

Session Chair: Jorge Herskovic

**How Many Patients are “Normal”? Only 1.55%**
G. Weber, Beth Israel Deaconess Medical Center

**Diagnostic Prediction of Von Willebrand Disease using Multiple Bleeding Phenomics Datasets**
S. Mollah, The Rockefeller University

"Sitting on Pins and Needles": Characterization of Symptom Descriptions in Clinical Notes
T. Forbush, VA Salt Lake City Healthcare System; A. Gundlapalli, University of Utah; M. Palmer, VA Salt Lake City Health Care System; S. Shen, University of Utah; B. South, VA Salt Lake City Health Care; G. Divita, M. Carter, A. Redd, University of Utah; J. Butler, Veteran's Affairs; M. Samore, University of Utah

**Extracting Actionable Findings of Appendicitis from Radiology Reports Using Natural Language Processing**
B. Rink, K. Roberts, S. Harabagiu, University of Texas at Dallas; R. Scheuermann, J. Craig Venter Institute; S. Toomay, T. Browning, T. Bosler, R. Peshock, U.T. Southwestern Medical Center

**TBI-16: Papers/Podium Presentations – TBI in Oncology**
Room: Cyril Magnin I

Session Chair: Yohan Lee

**Qualitative and Quantitative Image-based Biomarkers of Therapeutic Response in Triple-negative Breast Cancer**
D. Golden, Stanford University; J. Lipson, M. Telli, J. Ford, Stanford University Medical Center; D. Rubin, Stanford University

**Platform for Personalized Oncology: Integrative Analyses Reveal Novel Molecular Signatures Associated with Colorectal Cancer Relapse**
S. Madhavan, Georgetown University

**Domain Landscapes of Somatic Mutations in Cancer**
T. Peterson, D. Park, M. Kann, University of Maryland, Baltimore County

**Database Integration of 2256 Publicly-available Samples of Breast Cancer Molecular and Clinical Data**
C. Planey, A. Butte, Stanford University

*Tweet your Session #TBICRI13*
TBI-17: Papers/Podium Demonstrations – Pharmacogenomics Decision Support  
Session Chair: Robert Freimuth

Providing Pharmacogenomics Clinical Decision Support Using Whole Genome Sequencing Data as Input  
V. Huser, J. Cimino, National Institutes of Health, Clinical Center

Toward Semantic Modeling Pharmacogenomic Knowledge for Clinical and Translational Decision Support  
R. Boyce, University of Pittsburgh; R. Freimuth, Mayo Clinic; K. Romagnoli, T. Pummer, H. Hochheiser, P. Empey, University of Pittsburgh

Development of a Scalable Pharmacogenomic Clinical Decision Support Service  
V. Fusaro, Harvard Medical School; C. Brownstein, W. Wolf, C. Clinton, S. Savage, Children’s Hospital Boston; K. Mandl, Harvard Medical School; D. Margulies, S. Manzi, Boston Children’s Hospital

A Framework of Knowledge Integration and Discovery for Supporting Pharmacogenomics Target Predication of Adverse Drug Events: A Case Study of Drug-induced Long QT Syndrome  
G. Jiang, C. Wang, Q. Zhu, Mayo Clinic College of Medicine; C. Chute, Mayo Clinic

3:00 p.m. – 3:30 p.m. Coffee Break  
Room: Cyril Magnin Foyer

3:30 p.m. – 5:00 p.m. TBI Closing Session: Translational Bioinformatics Year in Review  
Room: Cyril Magnin I/II

RUSS ALTMAN, MD, PhD  
Professor of Bioengineering and Genetics, Stanford University

(See page 13 GREEN for description.)

5:00 p.m. – 6:00 p.m. CRI Poster Session 1  
Room: Cyril Magnin Foyer

(See page 22 GREEN for list of posters, listed alpha order by first author.)

6:00 p.m. – 7:30 p.m. Natural Language Processing Working Group Business Meeting  
Room: Balboa

6:00 p.m. – 8:00 p.m. i2b2 Academic Users’ Group (AUG) Workshop (Affiliate Event)  
Room: Mission

6:00 p.m. – 9:30 p.m. The Ohio State University Red & Grey Reception (Affiliate Event)  
Room: Cyril Magnin III
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<td>V. Muthukumar, S. Peisert, University of California, Davis</td>
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<td>I. Stashko, E. Hwang, Duke University Medical Center</td>
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M. Tennant, R. Garcia-Milian, J. Lyon, H. Norton, C. Botero, University of Florida  
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Governance and Oversight Methods to Streamline Access to an Academic Medical Center’s Integrated Data Repository  
L. Waitman, D. Connolly, K. Blackwell, S. Gebar, University of Kansas Medical Center  
Board 49

Temporal Phenome Analysis of a Large Clinical Cohort Predicts Hospital-Acquired Complications  
J. Warner, Vanderbilt University; A. Zollanvari, Texas A&M; P. Zhang, Massachusetts Institute of Technology; G. Snyder, G. Alterovitz, Harvard Medical School  
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Metadata-centered Development for a Community Registry System  
A. Waters, Duke University; J. Frund, Duke Translational Medicine Institute; M. Smerek, Duke University; A. Walden, Duke Clinical Research Institute; G. Del Fiol, University of Utah  
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EAGER-Profiles: Using Researcher Profiles to Demonstrate the Impact of Investments in Science  
G. Weber, Harvard Medical School  
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Developing a Framework for Sustaining Multi-institutional Interdisciplinary Community Participatory Comparative Effectiveness Research  
A. Wilcox, S. Yoon, Columbia University; B. Boden-Albala, Mount Sinai; T. Bigger, Columbia University; P. Feldman, Visiting Nurse Service of New York; C. Weng, S. Bakken, Columbia University  
Board 53

The MURDOCK Study: Self-reported and EHR-derived Phenotypes Supporting Biomarker Discovery  
Board 54

A Model for Secure Multi-institutional Cohort Query  
M. Wyatt, E. Berner, R. Hendrickson, University of Alabama at Birmingham; A. Davidson, Colorado School of Public Health; J. Bondy, University of Colorado Denver; M. Ames, University of Colorado Cancer Center; P. Embi, D. Ervin, The Ohio State University; T. Houston, University of Massachusetts Medical School; R. Zottola, T. English, University of Massachusetts School of Medicine; S. Wang, The Ohio State University; N. Thota, University of Alabama at Birmingham; P. Ranauro, University of Massachusetts School of Medicine  
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Content Mining of Titles of Clinical Nursing Research Papers to Inform the Development of Tools to Support Clinical Research  
S. Yoon, M. Co Jr., A. Wilcox, S. Bakken, Columbia University  
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Automatic Ventricle Chamber Segmentation Using a Regression Neural Network Initialization Based Active Shape Model  
A. Zifan, UCSD; A. Shafquat, Massachusetts Institute of Technology; B. Chapman, University of California, San Diego  
Board 57

Early Statin Adherence as a Predictor of Later Adherence  
A. Zimolzak, Harvard Medical School; C. Spettell, J. Fernandes, Aetna; V. Fusaro, N. Palmer, Harvard Medical School; S. Saria, Johns Hopkins University; M. Jonikas, McKinsey & Co.; I. Kohane, K. Mandl, Harvard Medical School  
Board 58
7:00 a.m. – 8:30 a.m.  Coffee and Pastries  
Room: Cyril Magnin Foyer

7:00 a.m. – 8:30 a.m.  Birds-of-a-Feather Session

**CRI-BOF-01: Data Management and Coordinating Centers**  
*J. Bonner, Michigan State University*

Participants will discuss common and emergent informatics issues related to the management, staffing, leadership, and strategic planning of data management and coordinating centers (for multi-site studies or research networks.) This session will build up topics from BOF sessions and posters from past CRI summits.

**CRI-BOF-02: Research Use of EHR/Clinical Data**  
*B. Delaney, Kings College; A. Das, Dartmouth; S. Liaw, University of New South Wales*

This session will explore the use of EHR to support research. The particular focus will be Patient registries – looking at reliability and accuracy of deriving registers from EHR and assessing/managing the quality of the associated information so that it is fit for purpose.

**CRI-BOF-03: Defining Workflows in Investigator-initiated Clinical Trials**  
*B. LaSalle, University of Utah*

Participants will discuss and articulate common workflows in the lifecycle of investigator initiated research, including: pre-clinical activity (e.g., study design, contracts, regulatory, & training), trial conduct (e.g., recruitment, enrollment, randomization, unblinding, safety issues, biospecimen collection, termination), and post-trial (e.g., data verification, validation, data sets, analysis, statistical analysis plan, CONSORT). In addition, participants will identify informatics issues during this life cycle, including what can be generalized or standardized for use in future trials.

7:00 a.m. – 5:30 p.m.  Registration Open  
Room: Cyril Magnin Foyer

8:30 a.m. – 10:00 a.m.  Scientific Sessions

**CRI-05: Panel - Next-generation Registries: Fusion of Data for Care and Research**  
*K. Mandl, Harvard Medical School; M. Natter, Children's Hospital Boston; C. Malone, Remedy Informatics; K. Marsolo, University of Cincinnati College of Medicine; S. Edge, Roswell Park Cancer Center*

Disease-based registries provide a well-established mechanism for procuring high-quality, gold standard data for clinical research as well as for population management in clinical care. Yet, limitations imposed by a legacy of significant operational costs, resource requirements, and data non-portability have created barriers to their broader utility. The need for cost effective, multi-sourced, and widely shareable clinical data sets has never been greater, and will require adoption of next-generation registry platforms that can robustly support multi-center studies, comparative effectiveness research, and post-marketing surveillance, and disease management. This panel examines diverse registry efforts, academic and industrial, for clinical, research and hybrid use cases.
CRI-06: Papers/Podium Presentations - Clinical Care
Session Chair: Judy Logan

Mining for Clinical Expertise in (Undocumented) Order Sets to Power an Order Suggestion System
J. Chen, Stanford University Hospital; R. Altman, Stanford University

Workflow-based Data Reconciliation for Clinical Decision Support: Case of Colorectal Cancer Screening and Surveillance
K. Wagholikar, S. Wu, S. Sohn, S. Buehler, Mayo Clinic; V. Kaggal, Mayo Clinic College of Medicine; R. Greenes, Arizona State University; T. Wu, D. Larson, Mayo Clinic; H. Liu, Mayo Clinic College of Medicine; R. Chaudhry, L. Boardman, Mayo Clinic

Automated Task Recognition and Care Process Summarization in an ICU using 3D Sensing
C. Lea, J. Fackler, G. Hager, R. Taylor, S. Saria, Johns Hopkins University

Bias in Recording of Body Mass Index Data in the Electronic Health Record
S. Rea, Intermountain Healthcare; K. Bailey, J. Pathak, Mayo Clinic; P. Haug, Intermountain Healthcare

CRI-07: Papers/Podium Presentations - Privacy/Security
Session Chair: Shawn Murphy

Identifying Inference Attacks against Healthcare Data Repositories
J. Vaidya, Rutgers University; B. Shafiq, LUMS; X. Jiang, L. Ohno-Machado, University of California at San Diego

Redactable and Auditable Data Access for Bioinformatics Research
J. Brown, M. Ahamad, M. Ahmed, D. Blough, Georgia Institute of Technology; T. Kurc, A. Post, J. Saltz, Emory University

Privacy-by-Design: Understanding Data Access Models for Secondary Data
H. Kum, S. Ahalt, UNC-CH

Development of an Electronic Research Permissions Management System to Enhance Informed Consents and Capture Research Authorizations Data
J. Obeid, K. Reilly, Medical University of South Carolina; K. Chalil Madathil, Clemson University; D. Rugg, C. Alstad, Medical University of South Carolina; K. Fryar, University of South Carolina; R. Alexander, Medical University of South Carolina; A. Gramopadhye, Clemson University; J. Moskowitz, University of South Carolina; I. Sanderson, Duke University

10:00 a.m. – 10:30 a.m. Coffee Break

Tweet your Session #TBICRI13
10:30 a.m. – 12:00 p.m.  Scientific Sessions

**CRI-08: Panel - Pains and Palliation in Distributed Research Networks: Lessons from the Field**  
*Room: Cyril Magnin I*

*M. Kahn, University of Colorado; J. Brown, Harvard Medical School; L. Dahm, UC Irvine Medical Center; D. Meeker, RAND Corporation; L. Schilling, University of Colorado*

Large-scale comparative effectiveness research studies require detailed clinical data collected across disparate clinical practice settings and institutions. Distributed research networks (DRNs) have been promoted as one approach to wide-scale data sharing that enables data sharing organizations to retain local data ownership and access control. Despite significant investments in distributed data sharing technologies, clinical research networks using distributed methods remain difficult to implement due to a broad range of organizational and technical barriers. The panelists represent four different research networks that are in different stages of implementation maturity and are leveraging different informatics technologies. Challenges common to all DRNs include governance, semantic interoperability, and identity management. This panel will describe some of the critical challenges and experimental solutions to implementing, expanding, and sustaining DRNs. Each panelist will focus on a specific challenge that requires new informatics tools to reduce barriers to participation and data sharing.

**CRI-09: Papers/Podium Presentations - Ontology 1**  
*Room: Cyril Magnin II*

**Session Chair: Adam Wilcox**

**Mining Genotype-phenotype Associations from Public Knowledge Sources via Semantic Web Querying**  
*R. Kiefer, R. Freimuth, C. Chute, J. Pathak, Mayo Clinic*

**Biomedical Terminology Mapper for UML projects**  
*J. Thibault, L. Frey, University of Utah*

**Dissecting the Ambiguity of FMA Concept Names Using Taxonomy and Partonomy Structural Information**  
*L. Luo, R. Xu, G. Zhang, Case Western Reserve University*

**Merging Ontology Navigation with Query Construction for Web-based Medicare Data Exploration**  
*G. Zhang, L. Cui, J. Teagno, Case Western Reserve University; D. Kaelber, The MetroHealth Center; R. Xu, Case Western Reserve University*

**CRI-10: EMR Text Processing/Phenotyping 3**  
*Room: Cyril Magnin III*

**Session Chair: David Eichmann**

**Network Analysis of Unstructured EHR Data for Clinical Research**  
*A. Bauer-Mehren, P. LePendu, S. Iyer, R. Harpaz, N. Leeper, N. Shah, Stanford University*

**Automatic Extraction of ICD-O-3 Primary Sites from Cancer Pathology Reports**  
*R. Kavuluru, University of Kentucky; I. Hands, E. Durbin, L. Witt, Kentucky Cancer Registry*

**Identifying Abdominal Aortic Aneurysm Cases and Controls using Natural Language Processing of Radiology Reports**  
*S. Sohn, Z. Ye, Mayo Clinic; H. Liu, Mayo Clinic College of Medicine; C. Chute, I. Kullo, Mayo Clinic*

**An Information Extraction Framework for Cohort Identification Using Electronic Health Records**  
*H. Liu; S. Bielinski, S. Sohn, S. Murphy, Mayo Clinic; K. Wagholiakar, Mayo Clinic College of Medicine; S. Jonnalagadda, R. K.E., S. Wu, I. Kullo, Mayo Clinic; C. Chute, Mayo Clinic*
In October 2011, the Association of American Medical Colleges (AAMC) along with the Association of Academic Health Sciences Libraries (AAHSL) and the National Library of Medicine (NLM) hosted the Sustaining the Digital Research Enterprise Summit to identify infrastructures and strategies needed to support the digital research enterprise today and into the future. A task force was created from this summit to address four priority needs:

- Mechanisms to identify and share standards for data management and governance
- Practices for designing and developing new infrastructures at scale
- Strategies and resources to cultivate a digitally literate workforce
- Approaches for national, state, and local advocacy to inform policy and funding

Working with its members and partner organizations the AAMC will create and maintain a stakeholder network to assist member organizations with planning, implementing, managing and sustaining the digital research enterprise. Digital resources are a key area of growth and expense for academic health centers in the next decade, and proactive planning is critical. Services provided through this network will include operational benchmarks, progression growth models, policy and governance resources. The network will also facilitate adoption and development of data standards and ontologies through communities of practice. Following presentations, the panel seeks the audience’s participation regarding how our community can address these challenges. No single institution has the capacity to solve this problem alone, but as a community of professionals motivated by mutual self-interest, we collectively have the potential to move research, education, and care forward through the digital deluge.

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<th>12:15 p.m. – 1:15 p.m.</th>
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<td><strong>Recombinant</strong></td>
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1:30 p.m. – 3:00 p.m.  Scientific Sessions

**CRI-011: Panel - Tools for Identifying Reliable Evidence and Implementing it in Everyday Clinical Care**  
*Room: Cyril Magnin I*

A. Cohen, Oregon Health & Science University; D. Demner-Fushman, National Institutes of Health; A. Iorio, McMaster University; I. Sim, UCSF School of Medicine; N. Smalheiser, University of Illinois at Chicago

Just as translational medicine follows a long winding path from bench-to-bedside, so can Evidence-Based Medicine be envisioned as comprising a multi-step pipeline, from building evidence from raw data through synthesizing best practices and providing clinical decision support in a process described as the “evidence pyramid”.1 At one end, a heterogeneous mix of clinical and experimental studies including clinical trials, case reports, animal models and retrospective analyses are published as new knowledge. Then, experts collect and assess high-quality relevant evidence on specific issues and publish their conclusions (e.g., regarding efficacy and safety of treatments) as systematic reviews and meta-analyses. Finally, when an expert consensus has been reached, this must reach the attention of policy makers within the profession, the government and insurance companies, resulting in new practice guidelines and altered clinical practice within hospitals and clinics. At each stage, this process requires a large investment of time and effort from many individuals with a wide range of expertise. Our panel will discuss the variety of innovative approaches that are being taken by different informatics research groups to improve each step within the evidence based medicine pipeline. These approaches are, in part, devoted to making existing data collection and synthesis practices faster and more efficient, but they also involve re-imagining and re-engineering the processes by which evidence is accumulated, evaluated and applied.

**CRI-12: Papers/Podium Presentations - Infrastructure 1**  
*Room: Cyril Magnin II*

Session Chair: Brian Chapman

**App Store for EHRs and Patients Both**  
C. Franckle Jr, Boston Children’s Hospital; D. Haas, University of California, Berkeley; K. Mandl, Harvard Medical School

**An iOS Framework for the Indivo X Personally Controlled Health Record**  
P. Pfiffner, Children’s Hospital Boston; K. Mandl, Harvard Medical School

**Leverage Hadoop Framework for Large Scale Clinical Informatics Applications**  
X. Dong, Center for Clinical and Translational Science; N. Bahroos, E. Sadhu, T. Jackson, M. Chukhman, R. Johnson, A. Boyd, D. Hynes, University of Illinois at Chicago

**Open Research Networking Gadgets (ORNG)**  
E. Meeks, B. Turner, A. Chatterjee, L. Yuan, University of California, San Francisco

**CRI-13: Papers/Podium Presentations - Policy/Clinical Trials**  
*Room: Cyril Magnin III*

Session Chair: Funda Meric-Bernstam

**Don’t Take your EHR to Heaven, Donate it to Science: Legal and Research Policies for EHR Post Mortem**  
V. Huser, J. Cimino, NIH Clinical Center

**Creating a Research and Clinical Care Partnership through EMR and Clinical Research System Integration**  
D. Ranganathan, M. Bell, D. Willett, R. Peshock, U.T. Southwestern Medical

**EHR-based Clinical Trial Alert Effects on Recruitment to a Neurology Trial across Institutions: Interim Analysis of a Randomized Controlled Study**  
Y. Khan, C. Roth, P. Payne, E. Patterson, The Ohio State University; L. Anthony, N. Elder, M. Eckman, University of Cincinnati; P. Embi, The Ohio State University

**Towards a Dynamic Question/Answer-based Search Engine for Clinical Trials**  
R. Miotto, C. Weng, Columbia University
Semantic ETL into i2b2 with Eureka!
A. Past, T. Kurc, H. Rathod, S. Agravat, M. Mansour, W. Torian, J. Saltz, Emory University

Clinical and Research i2b2 Data Integration: The FSM Experience
D. Segagni, V. Tibollo, A. Dagliati, Fondazione Salvatore Maugeri; A. Malovini, University of Pavia; A. Zambelli, C. Napolitano, S. Priori, Fondazione Salvatore Maugeri; R. Bellazzi, Università di Pavia

Distributed Health Outcome Monitoring and Evaluation Using i2b2
W. Adams, Boston University; N. Anderson, University of Washington; E. Berner, University of Alabama at Birmingham; D. Schauer, University of Cincinnati; R. Zottola, University of Massachusetts School of Medicine; E. McClure, Boston University; M. Wyatt, University of Alabama at Birmingham

Supporting the Health Quality Measures Format in i2b2
J. Klann, S. Murphy, Massachusetts General Hospital

3:00 p.m. – 3:30 p.m.  Coffee Break
Room: Cyril Magnin Foyer

1:30 p.m. – 3:00 p.m.  Scientific Sessions
Room: Cyril Magnin I

CRI-015: Panel - Standard-based Integration Profiles for Clinical Research and Patient Safety
C. Daniel, INSERM UMRS; L. Bain, CDISC; B. Delaney, Kings College London; G. Laleci Erturkmen, SRDC Ltd.; C. Vasa, Imperial College London

EHRs can now be adapted to integrate seamlessly with existing research platforms. However, key challenges need to be overcome in order to provide a platform that functions across many EHR systems. The IHE Quality, Research and Public Health (QRPH) domain addresses the information exchange standards necessary to share information relevant to quality improvement in patient care and clinical research. In collaboration with CDISC’s Healthcare Link initiative, IHE QRPH has developed a set of integration profiles that specifically address EHR-enabled research. The panel participants from three European projects will present how subsets of existing IHE QRPH profiles can be pulled together (and extended when necessary) to form a super profile which will standardize and automate the clinical trial process flow. The EHR4CR project is providing adaptable, reusable and scalable tools and services for reusing data from hospital EHRs for Clinical Research. TRANSFoRm is developing an informatics infrastructure to support the learning healthcare system in European Primary Care. SALUS project is providing scalable, standard based interoperability framework for sustainable proactive post market safety studies. Overall, the panel will discuss the key steps towards realizing a joint EHR4CR/TRANSFoRm/SALUS
European projectathon demonstrating EHR-enabled clinical research across Europe using standard-based integration and content profiles.

**CRI-16: Papers/Podium Presentations - Ontologies 2**  
*Room: Cyril Magnin II*

Session Chair: Rachel Richesson

**DEDUCE Clinical Text: An Ontology-based Module to Support Self-service Clinical Notes Exploration and Cohort Development**

*C. Roth, S. Rusincovitch, M. Horvath, S. Brinson, S. Evans, H. Shang, J. Ferranti, Duke Medicine*

**Towards Understanding Craniofacial Abnormalities: The Ontology of Craniofacial Development and Malformation**

*J. Brinkley, J. Mejino, L. Detwiler, R. Travillian, M. Clarkson, T. Cox, C. Heike, M. Cunningham, University of Washington; H. Hochheiser, University of Pittsburgh; L. Shapiro, University of Washington*

**Framework for Curating and Applying Data Elements within Continuing Use Data: A Case Study from the Durham Diabetes Coalition**


**CRI-17: Papers/Podium Presentations - Infrastructure 2**  
*Room: Cyril Magnin III*

Session Chair: Dipti Ranganathan

**SPARC: A Multi-institutional Integrated Web Based Research Management System**

*R. Sampson, J. Glenn, A. Cates, M. Scott, J. Obeid, Medical University of South Carolina*

**Biobanking Informatics Infrastructure to Support Clinical and Translational Research**

*B. LaSalle, J. Mitchell, M. Varner, J. Botkin, University of Utah; M. Jackson, Intermountain Healthcare; L. Stark, University of Utah; M. Cessna, N. Hulse, Intermountain Healthcare; A. Bernasconi, R. Madsen, N. Schultz, R. Bradshaw, University of Utah*

**Augmenting EHR-derived Clinical Data with Geographic-level Public Information to Develop Research Hypotheses for Population Obesity Rates**

*C. Roth, Y. Khan, R. Foraker, P. Embi, The Ohio State University*

**Characterization of the Biomedical Query Mediation Process**

*G. Hruby, Columbia University Medical Center; M. Boland, Columbia University; J. Cimino, NIH Clinical Center; J. Gao, A. Wilcox, J. Hirschberg, C. Weng, Columbia University*

5:00 p.m. – 6:00 p.m.  
**CRI Poster Session II and Reception**  
*Room: Cyril Magnin Foyer*

*(See page 34 GREEN for list of posters, listed alpha order by first author.)*

6:00 p.m. – 7:30 p.m.  
**Clinical Research Informatics Working Group Business Meeting**  
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<td>Towards Sustainable Management of Statistical Continuity in Disease Registries Using Generative Terminologies and Formal Concept Analysis (FCA)</td>
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<td>What’s in a Name? Perceptions of a Clinical Trials Management System</td>
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<td>T. Campion, V. Blau, S. Brown, J. Levan, V. Nasso, M. Reppucci, C. Cole, Weill Cornell Medical College</td>
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<td>BioSTOR: Developing an Institutional Biobank Linked to the Clinical Record via i2b2</td>
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<td>R. Chakrabarty, T. Tran, W. Wolf, J. Bickel, Boston Children’s Hospital</td>
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<td>Electronic Research Consent Capture</td>
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<td>P. Chase, A. Elsey, X. Song, F. Levey, J. Liu, University of Florida</td>
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<td>Optimize Warfarin Treatment by Tailoring Protocol</td>
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<td>C. Chi, P. Tonellato, Harvard Medical School</td>
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<td>Automated Submission of Clinical Trials Results to ClinicalTrials.gov</td>
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<td>J. Cimino, NIH Clinical Center; E. Ayres, S. Rath, R. Freedman, NIH</td>
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<td>Subject Locator: Leveraging the Electronic Medical Record for Participant Recruitment</td>
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<td>J. Cowan, J. Scherdin, S. Stallings, P. Harris, Vanderbilt University</td>
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<td>Creation and Implementation of a Historical Controls Database From Randomized Clinical Trials- an “ePlacebo” Database</td>
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<td>J. Desai, E. Bowen, M. Danielson, R. Allam, M. Cantor, Pfizer</td>
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<td>Experience with a Technology Solution for Volunteer Registration and Trial Recruitment</td>
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<td>The Duke Breast Data Repository Model for Creating a Rich, Accurate and Clearly Defined Disease Specific Data-set</td>
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<td>From Small Practice-based Data To Big Data - Data Extraction Errors</td>
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8:30 a.m. – 10:00 a.m.  Scientific Sessions


M. Kahn, University of Colorado; E. Holve, AcademyHealth; M. Nahm, Duke University; P. Ryan, Johnson & Johnson; N. Weiskopf, Columbia University

The panel addresses the urgent need to ensure that comparative effectiveness research (CER) findings derived from diverse and distributed data sources are based on credible, high-quality data; and that the methods used to assess and report data quality are consistent, comprehensive, and available to data consumers. The panel consists of representatives from four teams levering electronic clinical data for CER, patient centered outcomes research (PCOR), and quality improvement (QI) and seeks to change the current paradigm where data quality assessment (DQA) is performed “behind the scenes” using one-off project specific methods. The panelists will present their process of harmonizing existing models for describing and measuring clinical data quality and will describe a comprehensive integrated framework for assessing and reporting DQA findings. The collaborative project is supported by the Electronic Data Methods (EDM) Forum, a three-year grant from the Agency for Healthcare Research and Quality (AHRQ) to facilitate learning and foster collaboration across a set of CER, PCOR, and QI projects designed to build infrastructure and methods for collecting and analyzing prospective data from electronic clinical data.
**CRI-19: Paper/Podium Presentations - EMR Text Processing/Phenotyping 4**  
Session Chair: Elmer Bernstam  
Room: Cyril Magnin II

Using Association Rule Mining for Phenotype Extraction from Electronic Health Records  
D. Li, G. Simon, J. Pathak, C. Chute, Mayo Clinic

Radiology Diagnostic Exchange Agents: Clinical Term Identification and Validation  
K. Shores, J. Konstan, J. Riedl, A. Taylor, D. Steinberger, T. Adam, University of Minnesota

Automatic Classification of Free-text Radiology Reports to Identify Limb Fractures using Machine Learning and the SNOMED CT Ontology  
G. Zuccon, A. Waghohikar, AEHRC, CSIRO; A. Nguyen, The Australian e-Health Research Centre; L. Butt, AEHRC, CSIRO; K. Chu, S. Martin, J. Greenslade, RBWH

Phenotype Information Retrieval for Existing GWAS Studies  
N. Alipanah, K. Lin, V. Venkatesh, H. Kim, L. Ohno-Machado, University of California-San Diego

**CRI-20: Paper/Podium Presentations - Ontology 3**  
Session Chair: James Cimino  
Room: Cyril Magnin III

Visualizing the Data - Using Lifelines2 to Gain Insights from Data Drawn from a Clinical Data Repository  
J. Manning, Carilion Clinic/Virginia Tech Carilion; B. Marciano, NIH National Institute of Allergy and Infectious Diseases; J. Cimino, NIH Clinical Center

Using Clinical Element Models for Pharmacogenomic Study Data Standardization  
Q. Zhu, R. Freimuth, J. Pathak, C. Chute, Mayo Clinic

An Ontology-based Method for Secondary use of Electronic Dental Record Data  
T. Schleyer, University of Pittsburgh, School of Dental Medicine; A. Ruttenberg, W. Duncan, University of Buffalo; M. Haendel, C. Torniai, Oregon Health & Sciences University; A. Acharya, Marshfield Clinic Research Foundation; M. Song, T. Thyvalikakath, K. Liu, University of Pittsburgh; P. Hernandez, Reparto Universitario

ADEFpedia 2.0: Integration of Normalized Adverse Drug Events (ADEs) Knowledge from the UMLS  
G. Jiang, H. Liu, Mayo Clinic College of Medicine; H. Solbrig, C. Chute, Mayo Clinic

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10:00 a.m. – 10:30 a.m.  **Coffee Break**  
Room: Cyril Magnin Foyer

10:30 a.m. – 12:00 p.m.  **CRI Closing Session and Clinical Research Informatics Year in Review**  
Room: Cyril Magnin I

**PETER J. EMBI, MD, MS, FACMI**  
Associate Professor, Rheumatology & Immunology Biomedical Informatics, The Ohio State University

*(See page 13 GREEN for description.)*