

Semantic Trilogy '13

4th International Conference on Biomedical Ontology ICBO 2013

9th Data Integration in Life Science DILS 2013

4th Canadian Semantic Web Conference CSWS 2013



Proceedings

International Conference on Biomedical Ontology 2013

Main Conference

Montreal, Quebec, Canada July 6th—12th 2013



Introduction

Ontologies are increasingly used in biology and medicine, and their use in annotation of both clinical and experimental data is now a common technique in integrative translational research. They are being developed for the description of biological and biomedical phenomena. To be maximally effective, such ontologies must work well together. As ontologies become more commonly used, the problems involved in achieving coordination in ontology development become ever more urgent. This conference addresses these problems. It brings together representatives of all major communities involved in the development and application of ontologies in biomedical research, health care, and related areas. In addition to papers, the conference features workshops and tutorials, posters, software demonstrations and a doctoral symposium.

Organizing Committee

Chairs:

- Co-Scientific Chair: Michel Dumontier (Carleton, Canada)
- Co-Scientific Chair: Christopher JO Baker (New Brunswick, Canada)
- Program Chair: Robert Hoehndorf (Cambridge, UK)
- Workshops and Tutorials Chair: Christopher Mungall (Berkeley, USA)
- Early Career Symposium Chair: Melissa Haendel (Oregon State, USA)
- Poster and Demonstration Chair: [Trish Whetzel](#) (Stanford, USA)
- Proceedings Chair: [Janna Hastings](#) (EMBL-EBI, UK; Geneva, Switzerland)
- Publicity Chair: Sivaram Arabandi (Ontopro, USA)
- Local chair: Gregory Butler (Concordia, Montreal, Canada)

Program Committee

Sivaram Arabandi, Elsevier Health Sciences, US
Michael Bada, University of Colorado, US
Christopher Baker, University of New Brunswick, CA
Colin Batchelor, Royal Society of Chemistry, UK
Judith Blake, The Jackson Laboratory, US
Olivier Bodenreider, NIH National Library of Medicine, US
Martin Boeker, University of Freiburg, DE
Anita Burgun, University of Rennes, FR
Alison Callahan, Carleton University, CA
Paolo Ciccarese, Harvard Medical School, US
James J Cimino, National Institutes of Health, US
Cristian Cocos, St Francis Xavier University, CA
Francisco Couto, Lisbon University, PT
Lindsay Cowell, University of Texas Southwestern Medical Center, US
Samuel Croset, European Bioinformatics Institute, UK
Alexander Diehl, University at Buffalo, US
Michel Dumontier, Carleton University, CA
Jesualdo Tomas Fernandez Breis, Universidad de Murcia, ES
Fred Freitas, Federal University of Pernambuco, BR
Gwen Frishkoff, Georgia State University, US
Pascale Gaudet, Swiss Institute of Bioinformatics, CH
John Gennari, University of Washington, US
Georgios Gkoutos, University of Cambridge, UK
Albert Goldfain, Blue Highway, LLC and University at Buffalo, US
Melissa Haendel, Oregon Health & Science University, US
Janna Hastings, European Bioinformatics Institute, UK
Heinrich Herre, University of Leipzig, DE
Pascal Hitzler, Wright State University, US
Robert Hoehndorf, University of Cambridge, UK
Lawrence Hunter, University of Colorado, US
Ludger Jansen, University of Rostock, DE

Simon Jupp, European Bioinformatics Institute, UK
Toshiaki Katayama, Database Center for Life Science, JP
C. Maria Keet, University of KwaZulu-Natal, ZA
Jin-Dong Kim, Database Center for Life Science, JP
Hilmar Lapp, NESCent, US
Nicolas Le Novère, Babraham Institute, UK
Suzanna Lewis, Lawrence Berkeley National Laboratory, US
Frank Loebe, University of Leipzig, DE
Phillip Lord, Newcastle University, UK
Despoina Magka, University of Oxford, UK
James Malone, European Bioinformatics Institute, UK
J. L. E. Mejino, Jr., University of Washington, US
Chris Mungall, Lawrence Berkeley National Laboratory, US
Mark Musen, Stanford University, US
Darren Natale, Georgetown University, US
Maxwell Neal, University of Washington, US
Anika Oellrich, Sanger Institute, UK
Helen Parkinson, European Bioinformatics Institute, UK
Bjoern Peters, La Jolla Institute for Allergy and Immunology, US
Dietrich Rebholz-Schuhmann, European Bioinformatics Institute, UK
Alexandre Riazanov, IPSNP Computing Inc, CA
Peter Robinson, Charité Hospital, DE
Alan Ruttenberg, University at Buffalo, US
Paul Schofield, University of Cambridge, UK
Stefan Schulz, Medical University of Graz, Austria
Barry Smith, University at Buffalo, US
Dagobert Soergel, University at Buffalo, US
Harold Solbrig, Mayo Clinic, US
Robert Stevens, Manchester University, UK
Christian Stoeckert, University of Pennsylvania , US
Trish Whetzel, Stanford University, US

Schedule

Mon July 8	Session	Start	Duration	Type	Speaker	Title
		8:45 AM	15 min	welcoming remarks		
	session 1: physiology	9:00 AM	1 hr	keynote	Yves Lussier	Personalized therapeutics powered by ontology-transforms
		10:00 AM	15 min	highlights paper		
		10:15 AM	15 min	short paper	Karen Eilbeck, Jason Jacobs, Sunanda McGarvey, Cynthia Vinion and Catherine Staes.	Exploring the use of ontologies and automated reasoning to manage selection of reportable condition lab tests from LOINC
		10:30 AM	30 min	coffee break		
		11:00 AM	20 min	long paper	Maxwell Neal, Daniel Cook and John Gennari.	An OWL knowledge base for classifying and querying collections of physiological models: A prototype human physiome
		11:20 AM	20 min	long paper	Yuki Yamagata, Hiroko Kou, Kouji Kozaki, Riichiro Mizoguchi, Takeshi Imai and Kazuhiko Ohe.	Ontological Model of Abnormal States and its Application in the Medical Domain
		11:40 AM	20 min	long paper	Albert Goldfain, Min Xu, Jonathan Bona and Barry Smith.	Ontology Based Annotation of Contextualized Vital Signs
		12:00 PM	1hr 30m	lunch		
	session 2: engineering	1:30 PM	1 hr	keynote 2	Deborah McGuinness	
		2:30 PM	15 min	highlights paper		
		2:45 PM	20 min	long paper	Simon Kocbek, Jin-Dong Kim, Jean-Luc Perret and Patricia L. Whetzel.	Visualizing ontology mappings to help ontology engineers identify relevant ontologies for their reuse
		3:05 PM	20 min	long paper	Jonathan M. Mortensen, Paul R.	Crowdsourcing Ontology Verification

Session	Start	Duration	Type	Speaker	Title
				Alexander, Mark A. Musen and Natalya F. Noy.	
	3:25 PM	15 min	short paper	Carlo Torniai, Shahim Essaid, Brian Lowe, Jon Corson-Rikert and Melissa Haendel.	Finding common ground: integrating the eagle-i and VIVO ontologies
	3:45 PM	30 min	coffee break		
early career track	4:15 PM				
	4:15 PM	15 min	EC1	Heiner Oberkampff, Sonja Zillner, Bernhard Bauer and Matthias Hammon.	An OGMS-based Model for Clinical Information (MCI)
	4:30 PM	15 min	EC2	Melanie Courtot, Jie Zheng, Chris Stoeckert, Ryan Brinkman and Alan Ruttenberg.	Diagnostic criteria and clinical guidelines standardization to automate case classification
	4:45 PM	15 min	EC3	William Duncan, Titus Schleyer and Alan Ruttenberg.	Representing Intracoronal Tooth Restorations in the Ontology for Oral Health and Disease
	5:00 PM	15 min	EC4	Leonid L. Chepelev and Michel Dumontier	The Web as a Distributed Biochemical Reactor: Semantically Enabled Metabolic Fate Prediction
	5:15 PM	15 min	EC5	Matthew Brush, Chris Mungall, Nicole Washington and Melissa Haendel	What's in a Genotype?: An Ontological Characterization for Integration of Genetic Variation Data
	5:30 PM	15 min	break		
	5:45 PM	45 min	panel discussion #1	Yves Lussier, Trey Ideker, Mark Musen, Sivaram Arabandi	Q1: How will biomedical research benefit from big data, ontologies and the semantic web? Q2: Will automated, data- driven methods (networks, text mining, etc) outperform those using curated ontologies in terms of information content, cost and performance of task?

	Session	Start	Duration	Type	Speaker	Title
	Posters & Systems Demonstrations	6:30 PM	2 hours			
Tue July 9	ICBO Day 2					
	session 3: systems biology	9:00 AM	1 hr	keynote 3	Trey Ideker	
		10:00 AM	15 min	highlights paper		
		10:15 AM	15 min	short paper	Shahim Essaid, Carlo Torniai and Melissa Haendel.	Enabling semantic search in a bio-specimen repository
		10:30 AM	30 min	coffee break		
		11:00 AM	20 min	long paper	Snezana Nikolic, Prabhu Shankar, Sivaram Arabandi, Akshaye Dhawan, Rajshekhar Sunderraman, Sham Navathe, Kunal Malhotra and Rani Singh.	ONSTR: The Ontology for Newborn Screening Follow-up and Translational Research
		11:20 AM	20 min	long paper	Jie Zheng, Chris Stoeckert and Elisabetta Manduchi.	Development of an Application Ontology for Beta Cell Genomics Based On the Ontology for Biomedical Investigations
		11:40 AM	20 min	long paper	William Hogan, Josh Hanna, Eric Joseph and Mathias Brochhausen.	Towards a Consistent and Scientifically Accurate Drug Ontology
		12:00 PM	30 min	flash updates		
		12:30 PM	1 hr 30 minutes	lunch		
	session 4: ontology	2:00 PM	1 hr	keynote 4	Udo Hahn	
		3:00 PM	15 min	short paper	Jose L.V. Mejino Jr, Ravensara S Travillian, Timothy C Cox, James F Brinkley and Linda G Shapiro.	Human Development Domain of the Ontology of Craniofacial Development and Malformation

Session	Start	Duration	Type	Speaker	Title
	3:15 PM	30 min	coffee break		
	3:45 PM	20 min	long paper	Alexander P. Cox, Mark Jensen, Alan Ruttenberg, Kinga Szigeti and Alexander D. Diehl.	Measuring Cognitive Functions: Hurdles in the Development of the NeuroPsychological Testing Ontology
	4:05 PM	20 min	long paper	Christopher Ochs, Zhe He, Yehoshua Perl, Sivaram Arabandi, Michael Halper and James Geller.	Refining the Granularity of Abstraction Networks for the Sleep Domain Ontology
	4:25 PM	20 min	long paper	Catalina Martínez Costa and Stefan Schulz.	Ontology-based reinterpretation of the SNOMED CT context model
	16:45:00	15 min	break		
	5:00 PM	45 min	panel discussion #2	Udo Hahn, Deborah McGuinness, Barry Smith, Stefan Shultz, Robert Stevens, Mathias Brochhausen	Q1. What constitutes a result in ontology research and how must these be evaluated in order to be suitable for publication? Q2 What is the most feasible approach to facilitate interoperability of a growing number of ontologies?
	5:45 PM	15 min	concluding remarks & announcement of ICBO 2014		

Table of Contents

Research Papers

1. Exploring the use of ontologies and automated reasoning to manage selection of reportable condition lab tests from LOINC. 12-15
Karen Eilbeck, Jason Jacobs, Sunanda McGarvey, Cynthia Vinion and Catherine Staes
2. An OWL knowledge base for classifying and querying collections of physiological models: A prototype human physiome. 16-21
Maxwell Lewis Neal, Daniel L. Cook and John H. Gennari
3. Ontological Model of Abnormal States and its Application in the Medical Domain. 22-27
Yuki Yamagata, Hiroko Kou, Kouji Kozaki, Riichiro Mizoguchi, Takeshi Imai and Kazuhiko Ohe
4. Ontology Based Annotation of Contextualized Vital Signs. 28-33
Albert Goldfain, Min Xu, Jonathan Bona, and Barry Smith
5. Visualizing ontology mappings to help ontology engineers identify relevant ontologies for their reuse. 34-39
Simon Kocbek, Jin-Dong Kim, Jean-Luc Perret and Patricia L. Whetzel
6. Crowdsourcing Ontology Verification. 40-45
Jonathan M. Mortensen, Paul R. Alexander, Mark A. Musen , and Natalya F. Noy
7. Finding common ground: integrating the eagle-i and VIVO ontologies. 46-49
Carlo Torniai, Shahim Essaid, Brian Lowe, Jon Corson-Rikert, and Melissa Haendel
8. Enabling semantic search in a bio-specimen repository. 50-53
Shahim Essaid, Carlo Torniai and Melissa A. Haendel
9. ONSTR: The Ontology for Newborn Screening Follow-up and Translational Research. 54-61
Snezana Nikolic, Prabhu Shankar, Sivaram Arabandi, Akshaye Dhawan, Rajshekhar Sunderraman, Sham Navathe, Kunal Malhotra and Rani H. Singh
10. Development of an Application Ontology for Beta Cell Genomics Based On the Ontology for Biomedical Investigations. 62-67
Jie Zheng, Elisabetta Manduchi and Christian J. Stoeckert Jr
11. Towards a Consistent and Scientifically Accurate Drug Ontology. 68-73
William R. Hogan, Josh Hanna, Eric Joseph, and Mathias Brochhausen
12. Human Development Domain of the Ontology of Craniofacial Development and Malformation. 74-77
Jose LV Mejino Jr, Ravensara S Travillian, Timothy C Cox, Linda G Shapiro and James F Brinkley
13. Measuring Cognitive Functions: Hurdles in the Development of the NeuroPsychological Testing Ontology. 78-83
Alexander P. Cox, Mark Jensen, Alan Ruttenberg, Kinga Szigeti and Alexander D. Diehl
14. Choosing the Granularity of Abstraction Networks for Orientation and Quality Assurance of the Sleep Domain Ontology. 84-89
Christopher Ochs, Zhe He, Yehoshua Perl, Sivaram Arabandi, Michael Halper, and James Geller
15. Ontology-based reinterpretation of the SNOMED CT context model. 90-95
Catalina Martínez-Costa and Stefan Schulz

Early Career Symposium

1. An OGMS-based Model for Clinical Information (MCI). 97-100
Heiner Oberkamp, Sonja Zillner, Bernhard Bauer and Matthias Hammon
2. Diagnostic criteria and clinical guidelines standardization to automate case classification. 101-104
Mélanie Courtot, Jie Zheng, Christian J. Stoeckert Jr., Ryan R. Brinkman and Alan Ruttenberg
3. What's in a Genotype?: An Ontological Characterization for Integration of Genetic Variation Data. 105-108
Matthew H. Brush, Chris Mungall, Nicole Washington and Melissa A. Haendel
4. Representing Intracranial Tooth Restorations in the Ontology for Oral Health and Disease. 109-112
William Duncan, Titus Schleyer and Alan Ruttenberg
- The Web as a Distributed Biochemical Reactor: Semantically Enabled Metabolic Fate Prediction
Leonid L. Chepelev and Michel Dumontier 113-116

Posters

1. PopHR: An Integrated Semantic Framework for Population Health Surveillance 118
Arash Shaban-Nejad, Christian Jauvin, Maxime Lavigne, Masoumeh T. Izadi, Luke Mondor, Anya Okhmatovskaia, and David L. Buckeridge
2. The Ocular Disease Ontology 119
Patrick Ray and Alexander Diehl
3. Alignment of Cultured Cell Modeling Across OBO Foundry Ontologies: Key Outcomes and Insights 120
Matthew H. Brush, Jie Zheng, Yongqun He, Sirarat Sarntivijai, Bjoern Peters, Alexander D. Diehl, Christian J. Stoeckert and Melissa A. Haendel
4. Representing Disease Courses: An Application of the Neurological Disease Ontology to Multiple Sclerosis Typology 121
Mark Jensen, Alexander P. Cox, Barry Smith and Alexander D. Diehl
5. HINO: BFO-aligned ontology representation of human molecular interactions and pathways 122
Zoushuang Xiang and Yongqun He
6. HyQue: A Semantic Web tool for evaluating scientific hypotheses 123
Allison Callahan and Michel Dumontier
7. A Taxonomy for Immunologists 124
James A. Overton, Randi Vita, Jason A. Greenbaum, Heiko Dietze, Alessandro Sette, Bjoern Peters
8. Brain, Biomedical Knowledge Manipulation 125
Samuel Croset, John P. Overington and Dietrich Rebholz-Schuhmann
9. The Functional Therapeutic Chemical Classification System 125
Samuel Croset, John P. Overington and Dietrich Rebholz-Schuhmann
10. OncoCL: A Cancer Cell Ontology 126
Karen E. Rasmussen and Mary E. Dolan

Software Demonstrations

1. BLUSNO: A System for Orientation, Visualization, and Quality Assurance of SNOMED CT Using Abstraction Networks 128-129
Christopher Ochs, Yehoshua Perl and James Geller
2. eagle-i: ontology-driven federated search and data entry tools for discovering biomedical research resources. 130-131
Melissa Haendel, Carlo Torniai, Nicole Vasilevsky, Scott Hoffmann, and Daniela Bourges-Waldeg
3. Next generation ontology browser. 132-133
Tomasz Adamusiak, Naoki Shimoyama, Marek Tutaj and Mary Shimoyama
4. A method for semi-automatic extension of a middle-layer ontology. 134-135
Ulf Schwarz, Holger Stenzhorn, Nikolina Koleva, Luc Schneider and Emilio M. Sanfilippo
5. A Demonstration of Entity Identity Information Management Applied to Demographic Data in a Referent Tracking System. 136-137
Cheng Chen, Josh Hanna, John R. Talburt, Mathias Brochhausen, William R. Hogan
6. Introducing WebProtégé 2 as a Collaborative Platform for Editing Biomedical Ontologies 138-139
Matthew Horridge, Jonathan Mortensen, Tania Tudorache, Jennifer Vendetti, Csongor Nyulas, Mark A. Musen and Natalya F. Noy