



Enabling National  
Networking of Scientists

IASSIST Conference, June 2, 2010

Ellen Cramer and Jon Corson-Rikert, Presenters

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Valrie Davis, Medha Devare, Dean Krafft, Brian J.  
Lowe, and the

VIVO Collaboration

# VIVO Collaboration:

**Cornell University:** Dean Krafft (Cornell PI), Manolo Bevia, Jim Blake, Nick Cappadona, Brian Caruso, Jon Corson-Rikert, Elly Cramer, Medha Devare, Elizabeth Hines, Huda Khan, Brian Lowe, Joseph McEnerney, Holly Mistlebauer, Stella Mitchell, Anup Sawant, Christopher Westling, Rebecca Younes. **University of Florida:** Mike Conlon (VIVO and UF PI), Chris Barnes, Cecilia Botero, Kerry Britt, Erin Brooks, Amy Buhler, Ellie Bushhousen, Linda Butson, Chris Case, Christine Cogar, Valrie Davis, Mary Edwards, Nita Ferree, George Hack, Chris Haines, Rae Jesano, Margeaux Johnson, Sara Kreinest, Meghan Latorre, Yang Li, Paula Markes, Hannah Norton, Narayan Raum, Alexander Rockwell, Sara Russell Gonzalez, Nancy Schaefer, Dale Scheppler, Nicholas Skaggs, Matthew Tedder, Michele R. Tennant, Alicia Turner, Stephen Williams. **Indiana University:** Katy Borner (IU PI), Kavitha Chandrasekar, Bin Chen, Shanshan Chen, Jeni Coffey, Suresh Deivasigamani, Ying Ding, Russell Duhon, Jon Dunn, Poornima Gopinath, Julie Hardesty, Brian Keese, Namrata Lele, Micah Linnemeier, Nianli Ma, Robert H. McDonald, Asik Pradhan Gongaju, Mark Price, Yuyin Sun, Chintan Tank, Alan Walsh, Brian Wheeler, Feng Wu, Angela Zoss. **Ponce School of Medicine:** Richard J. Noel, Jr. (Ponce PI), Ricardo Espada Colon, Damaris Torres Cruz, Michael Vega Negrón. **The Scripps Research Institute:** Gerald Joyce (Scripps PI), Catherine Dunn, Brant Kelley, Paula King, Angela Murrell, Barbara Noble, Cary Thomas, Michaeleen Trimarchi. **Washington University School of Medicine in St. Louis:** Rakesh Nagarajan (WUSTL PI), Kristi L. Holmes, Caerie Houchins, George Joseph, Sunita B. Koul, Leslie D. McIntosh. **Weill Cornell Medical College:** Curtis Cole (Weill PI), Paul Albert, Victor Brodsky, Mark Bronnimann, Adam Cheriff, Oscar Cruz, Dan Dickinson, Richard Hu, Chris Huang, Itay Klaz, Kenneth Lee, Peter Michelini, Grace Migliorisi, John Ruffing, Jason Specland, Tru Tran, Vinay Varughese, Virgil Wong.

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## Problem:



- Researchers often struggle to locate and communicate with collaborators across fields and outside rigidly defined organizational confines

## Solution:



- VIVO will help facilitate communication and collaboration across interdisciplinary and institutional boundaries NOT ONLY for researchers, but also for administrators, students, faculty, donors, funding agencies, and the public

**Conlon, Michael** *Associate CIO, IT Architecture*[Personal web page](#) | [Clinical and Translational Science Institute Home Page](#) | [VIVO Home Page](#)**description**

Dr. Conlon is Associate CIO for IT Architecture, interim Director of Biomedical Informatics in the UF College of Medicine, Associate Director of the university's Clinical and Translational Science Institute, and Principal Investigator for VIVO: Enabling National Networking of Scientists. His responsibilities include development of academic biomedical informatics, expansion and integration of research and clinical information resources as well as strategic planning for university information resources. Previously Dr. Conlon served as Chief Information Officer of the University of Florida Health Science Center where he directed network and video services, desktop support, media and graphics, application development, teaching support, strategic planning and distance learning. He earned his Ph.D. degree in Statistics from the University of Florida, undergraduate degrees in Mathematics and Economics from Bucknell University, and is the author of over 150 scholarly publications and presentations. His current interests include enterprise change and organizational issues in the adoption of information technology, large scale data systems integration and enterprise architecture.

**research focus and activity**

[Clinical and Translational Science Institute](#) Associate Director, Biomedical Informatics Program Lead, 07/2009 -  
[Creating Academic Biomedical Informatics](#) Interim Division Chief, 07/2009 -  
[VIVO: Enabling National Networking of Scientists](#) Principal Investigator, 09/2009 -

**principalInvestigatorOn**

[VIVO: Enabling National Networking of Scientists](#)

**hasResearchArea**

[Biomedical Informatics](#)  
[Clinical Research Informatics](#)  
[Electronic Data Capture](#)  
[Statistical Computing](#)

**research keywords**

informatics, infrastructure, enterprise systems, identity management, clinical research, semantic web

**teaching focus and activity**

[Research Data Management](#) Instructor, 09/1980 -

**selected publications**

[Development of an Observational Instrument to Measure Mother-Infant Separation Post Birth](#) article 2004  
[DellenStat: Statistical Software to Accompany A Course in Modern Business Statistics](#) book 1991

A **semantic web application** that enables the discovery of research and scholarship across disciplines in an institution.

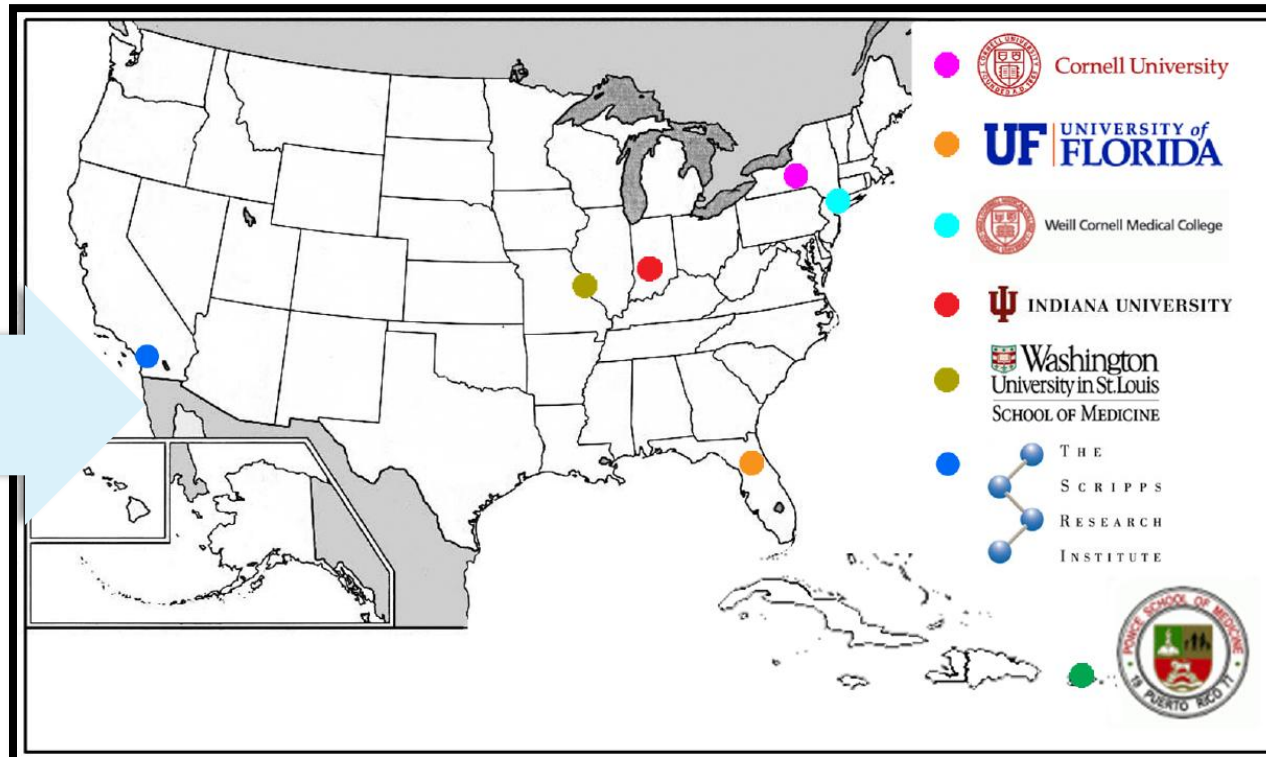
Populated with **detailed profiles** of faculty and researchers; displaying items such as publications, teaching, service, and professional affiliations.

A **powerful search functionality** for locating people and information within or across institutions.

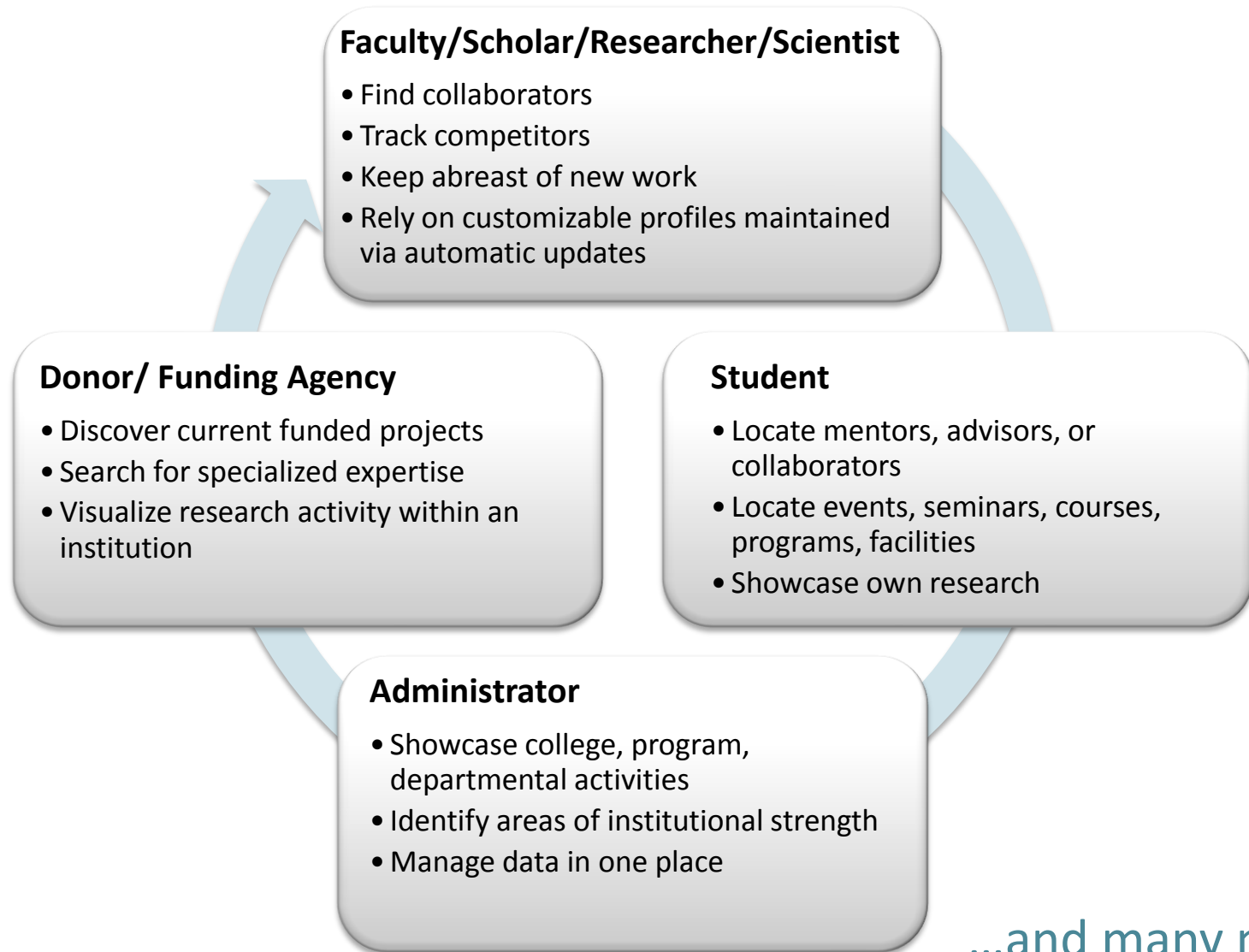
# VIVO Origins and Current Status

- Originally developed at Cornell University in 2004 to support Life Sciences
- Re-implemented using RDF, OWL, Jena and SPARQL in 2007
- Now covers all faculty, researchers and disciplines at Cornell
- Adopted at University of Florida in 2007
- Underlying system in use at Chinese Academy of Sciences and Australian Universities

In September 2009, seven institutions received \$12.2 million in funding from the National Center for Research Resources of the NIH to enable **National Networking with VIVO**



# Who can use VIVO?



...and many more!

# VIVO's three functional layers



end users



curators



ontology editing  
& data flow

Search and browse interface

Editing

Display, search and navigation setup

Curator editing

Ontology Editing

Data ingest

Data export



# VIVO as disseminator

 Cornell University

Search Cornell

<https://confluence.cornell.edu/display/collaborate/>

## Collaborate@Cornell

Global Partnerships, Knowledge, and Technology

*“As globalization reshapes academic disciplines as well as regional economies, institutions have begun to see their public-service missions in global terms. And they are forging new kinds of international partnerships to expand upon their expertise in the fields of particular importance to the developing world...”*

The Chronicle of Higher Education

### Discover locally what others are doing internationally

Collaborate@Cornell: Global Partnerships, Knowledge, and Technology is an on-campus opportunity for faculty, staff, and graduate students to reach across the quads and discuss how to share knowledge and research with international partners, particularly partners in developing countries. Nominate topics and participate in small-group discussions focused on technology and knowledge-sharing, and share and learn about current and on-the-horizon projects through lightning presentations.

### Find Cornell Collaborators by Country

Select a country to see who at Cornell has research interests there. (Don't see yourself listed? Visit [VIVO](#), login with your NetID and password to modify your page, or send an e-mail to [vivo-contact-L@cornell.edu](mailto:vivo-contact-L@cornell.edu).)

--- Select a Country ---



May 21, 2009  
9:00am - 4:00pm  
Mann Library

Welcoming address by Alice Pell, Vice Provost for International Relations

#### Topics

Topics will be continually updated as users register for this event.

- Cell phone technology
- Knowledge management systems
- Radio technology
- Knowledge sharing tools
- Information resources for researchers in developing countries
- Policy and capacity building
- Mapping technology
- Biodiversity conservation
- Online professional development for practitioners in developing countries
- Community Film Making

Contact Us

<http://gradededucation.lifesciences.cornell.edu/>



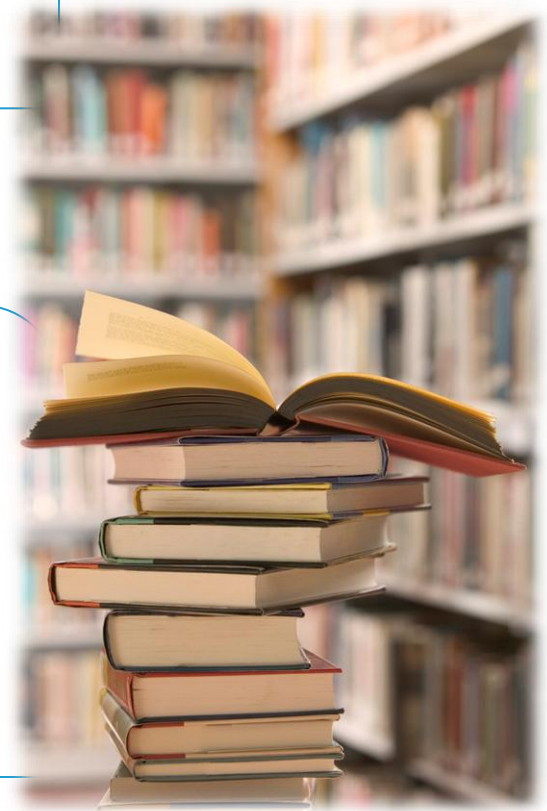
# A Library-based Support Model

## Libraries:

- Are a trusted, neutral entity
- Have a tradition of service and support
- Strive to serve all missions of the institution
- Are technology centers and have IT and data expertise

## Librarians:

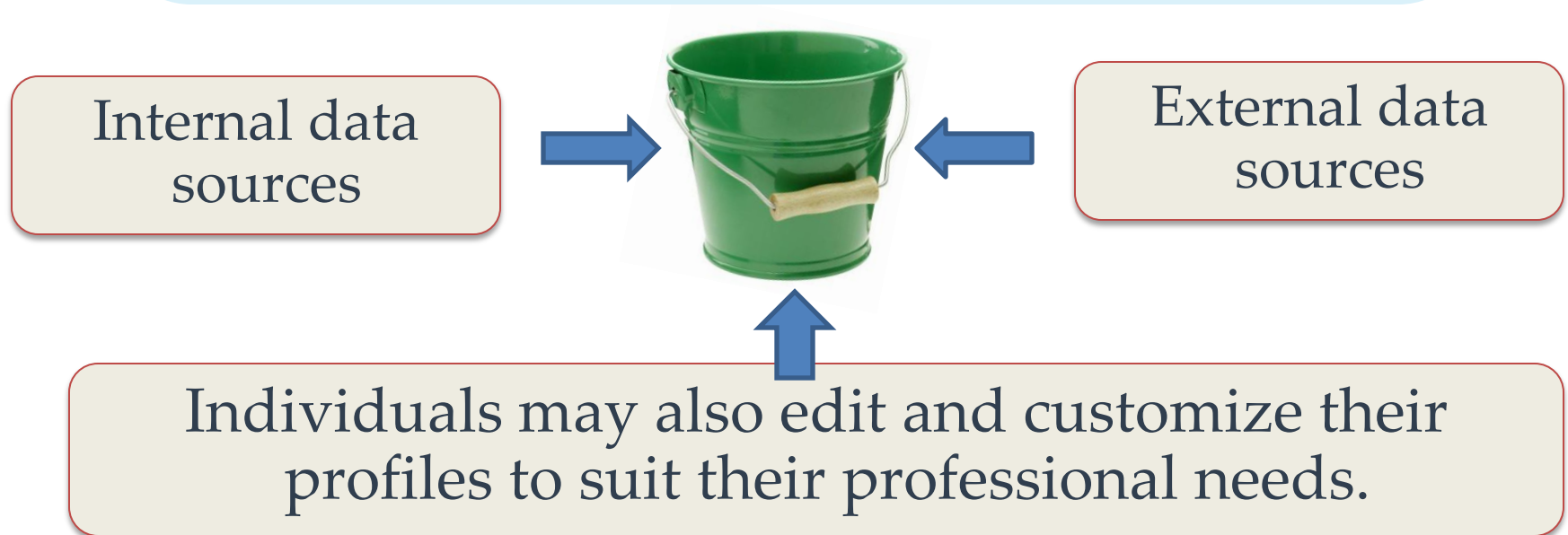
- Have skills—information organization, instruction, usability, subject expertise
- Have close relationships with their clients (buy in)
- Understand user needs
- Understand the importance of collaboration and know how to bring people together
- Have knowledge of institution, research, education, clinical landscape



# Data, Data, Data

VIVO harvests much of its data automatically from verified sources

- Reduces the need for manual input of data
- Provides an integrated and flexible source of publicly visible data at an institutional level

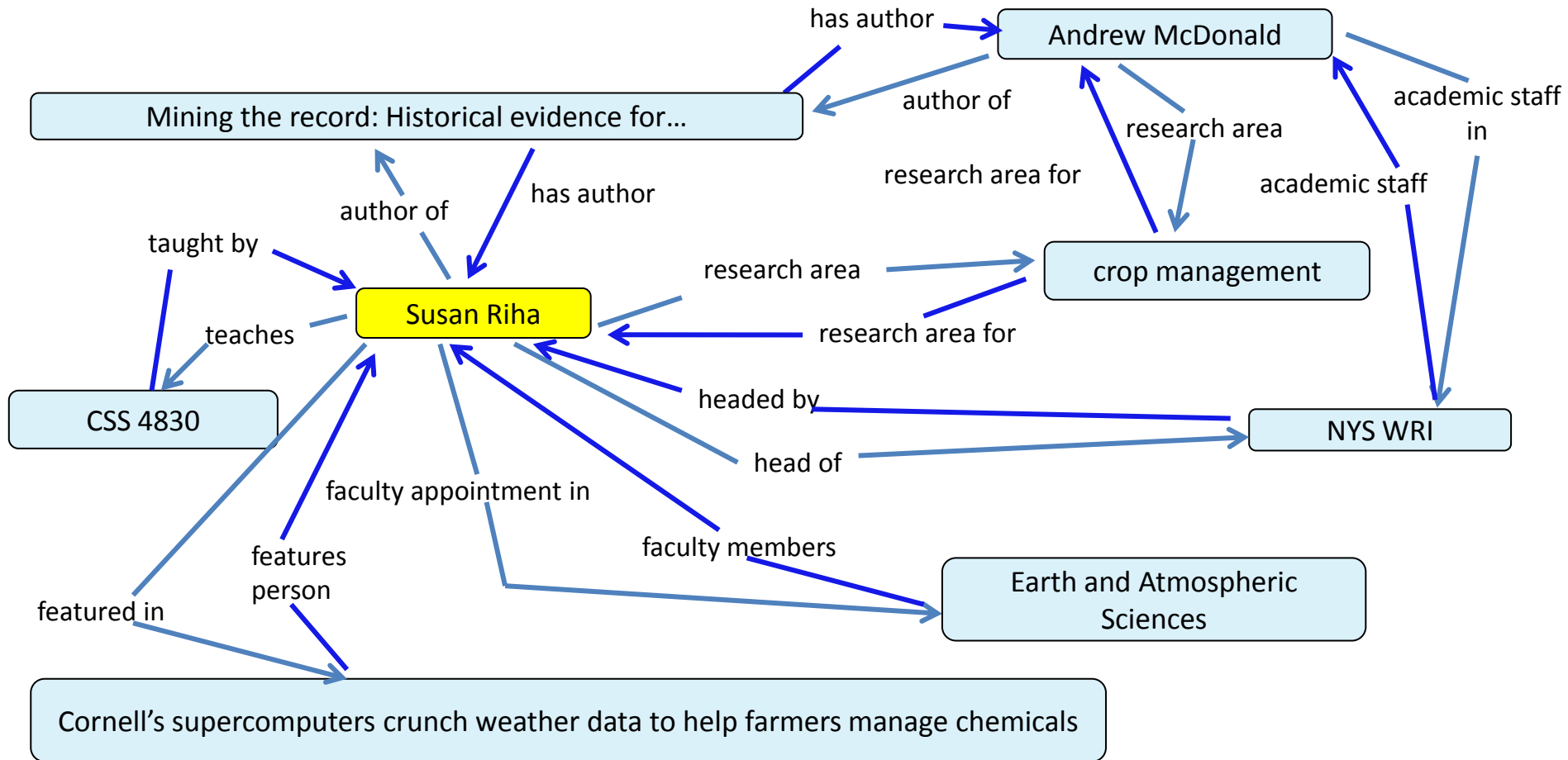


# Data in VIVO: Semantic Web standards

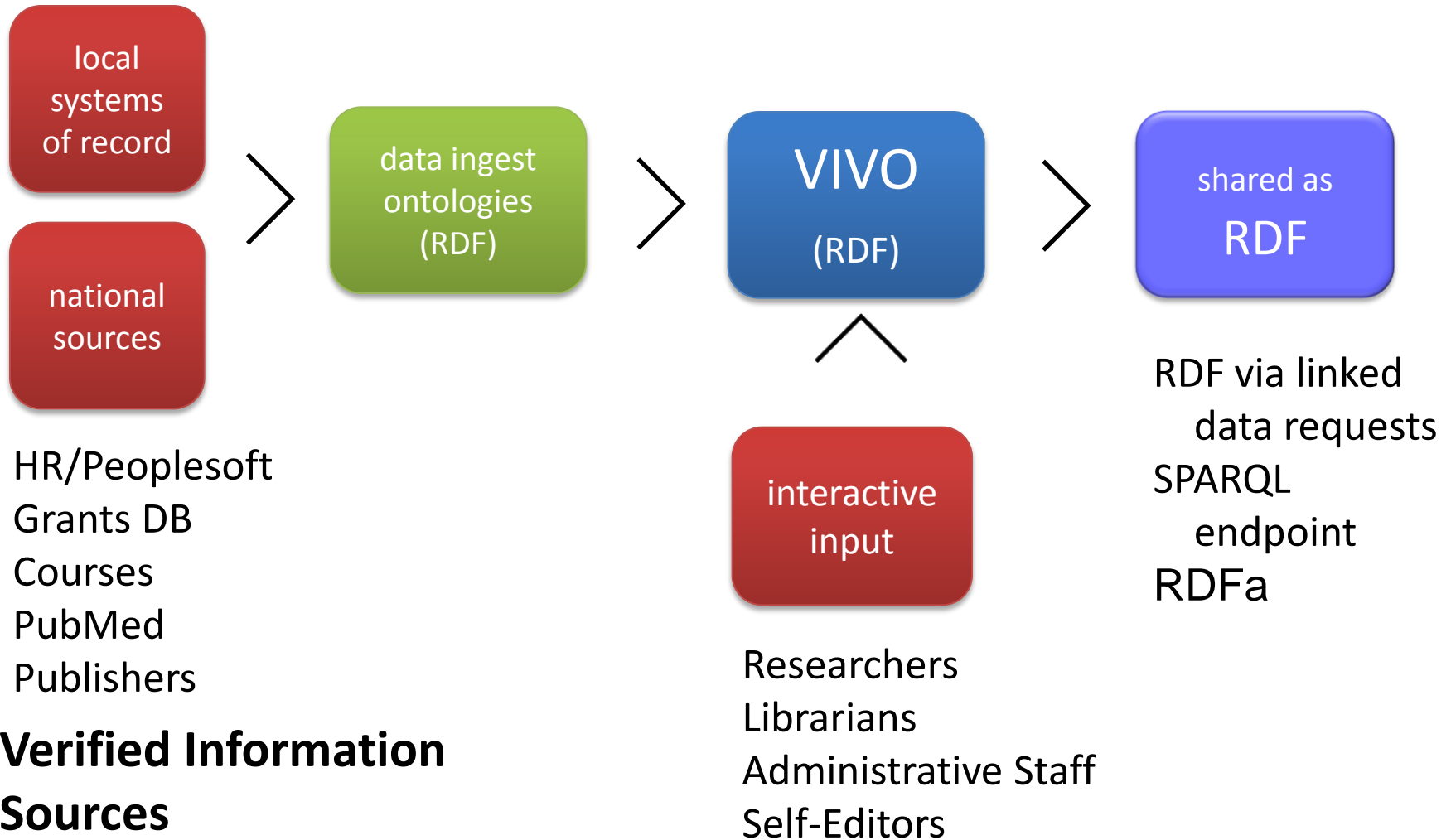
Subject	Predicate	Object
Cramer, Ellen J.	<a href="#">member of</a>	<a href="#">UI Team</a>
Cramer, Ellen J.	<a href="#">member of</a>	<a href="#">VIVO Development Team</a>
Cramer, Ellen J.	<a href="#">member of</a>	<a href="#">VIVO Outreach Team</a>
Cramer, Ellen J.	<a href="#">positions</a>	<a href="#">Usability Design Specialist</a>
Cramer, Ellen J.	<a href="#">educational background</a>	<a href="#">Nova Southeastern University, School of Computer and Information Science, PhD, 2004</a>
Cramer, Ellen J.	<a href="#">educational background</a>	<a href="#">SUNY Utica, Nursing, BS, 1981</a>
Cramer, Ellen J.	<a href="#">educational background</a>	<a href="#">University of Maryland, Public Health Informatics, Graduate Certificate, 2009</a>

- Stored in **Resource Description Framework (RDF)** triples
- Uses the **shared VIVO Core Ontology** to describe people, organizations, activities, publications, events, interests, grants, and other relationships
  - Incorporates Friend-of-a-Friend (FOAF) and Bibliographic Ontology (BIBO)
  - Supports institution-specific local ontology extensions

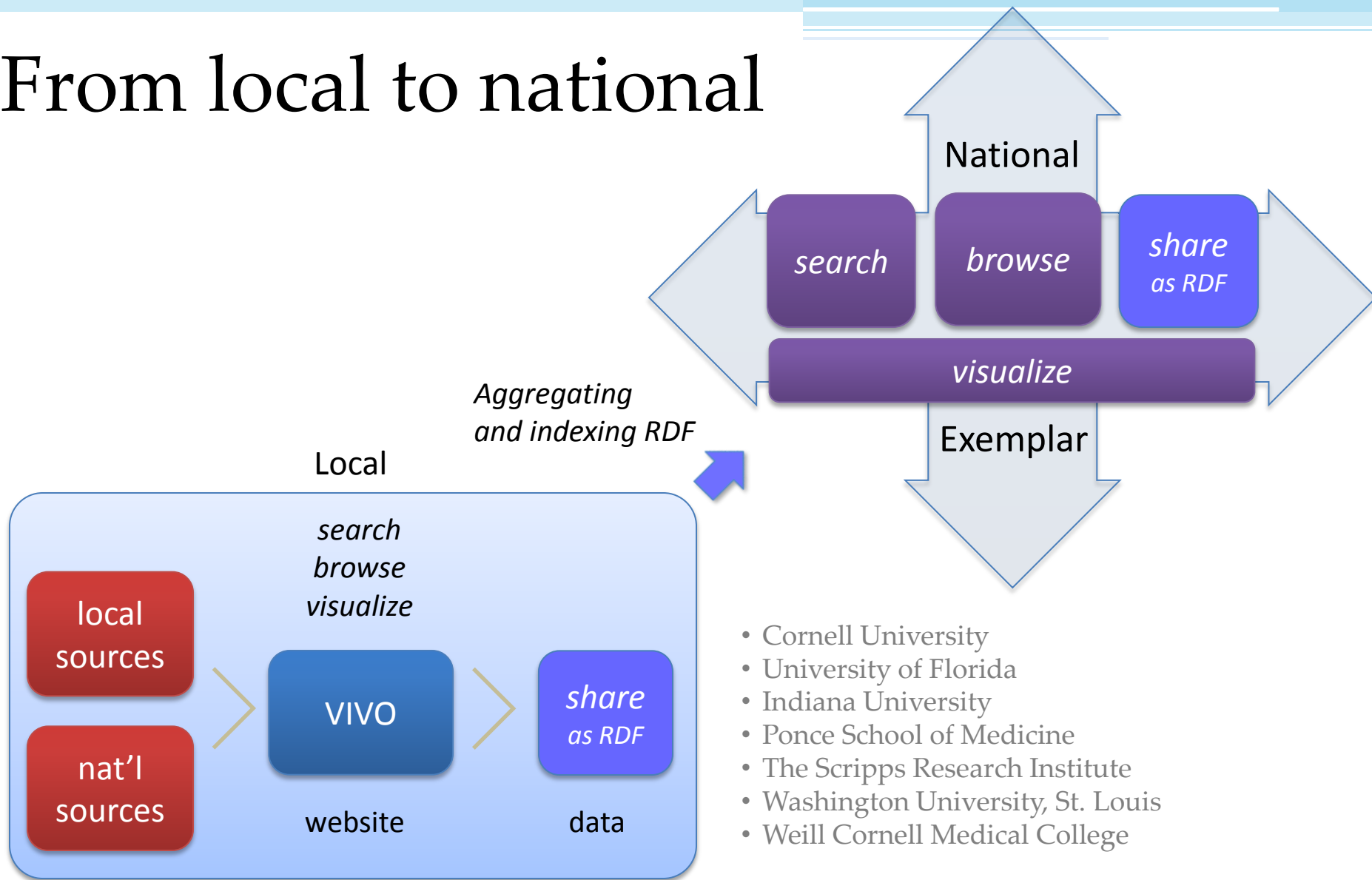
# Detailed relationships for a researcher



# Local data flow



# From local to national



# Linked Data principles

(Tim Berners-Lee)

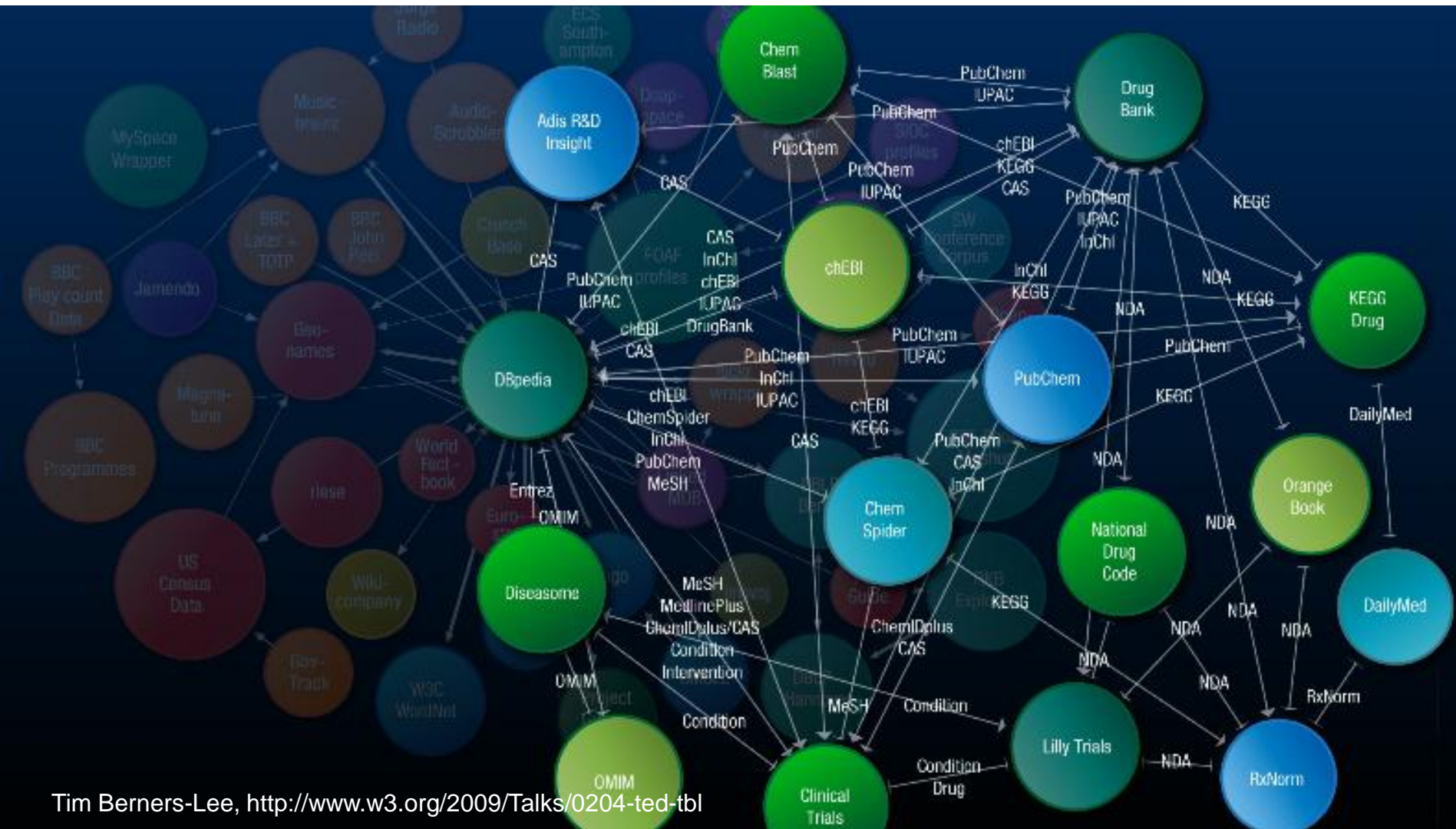
- Use URIs as names for things
- Use HTTP URIs so that people can look up those names
- When someone looks up a URI, provide useful information, using standards (RDF, SPARQL)
- Include links to other URIs so that people can discover more things

<http://www.w3.org/DesignIssues/LinkedData.html>

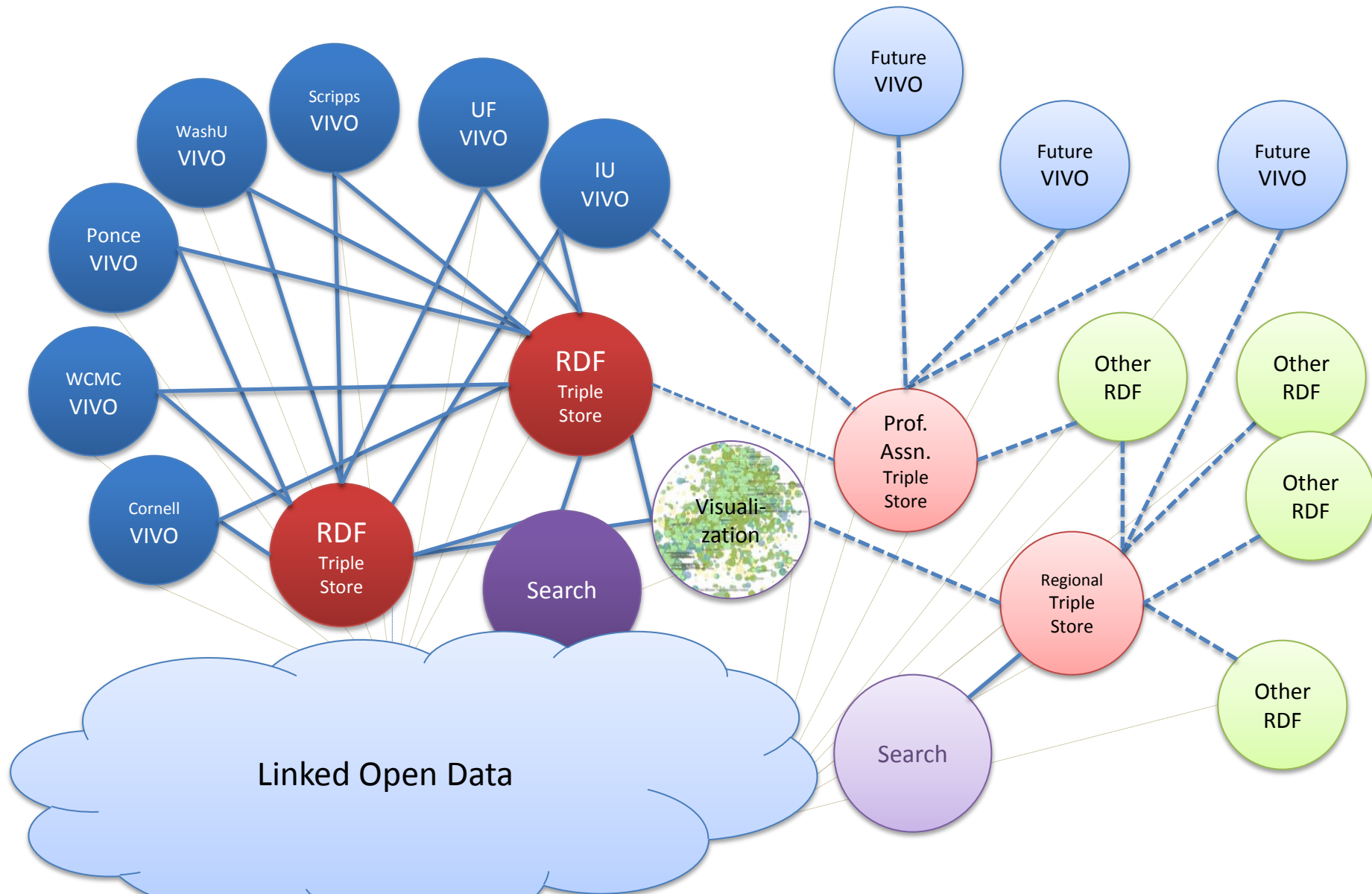
<http://linkeddata.org>



# VIVO enables authoritative data about researchers to join the Linked Data cloud

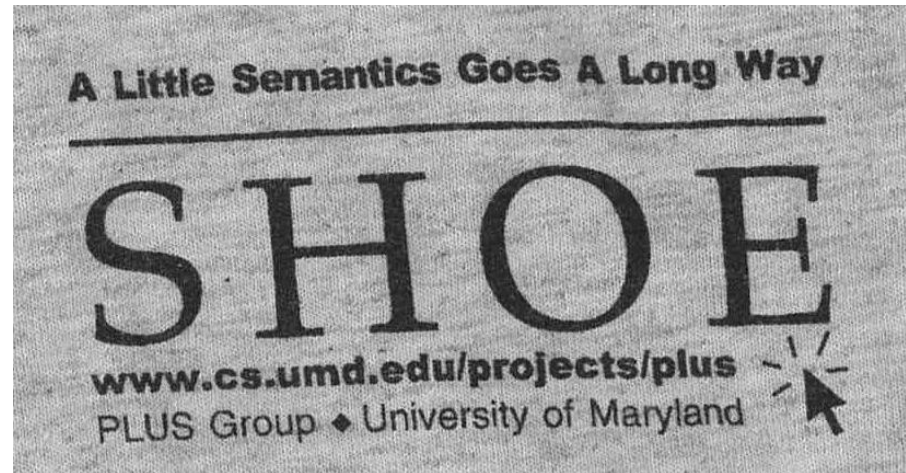


# National networking



# Challenges in the semantic approach

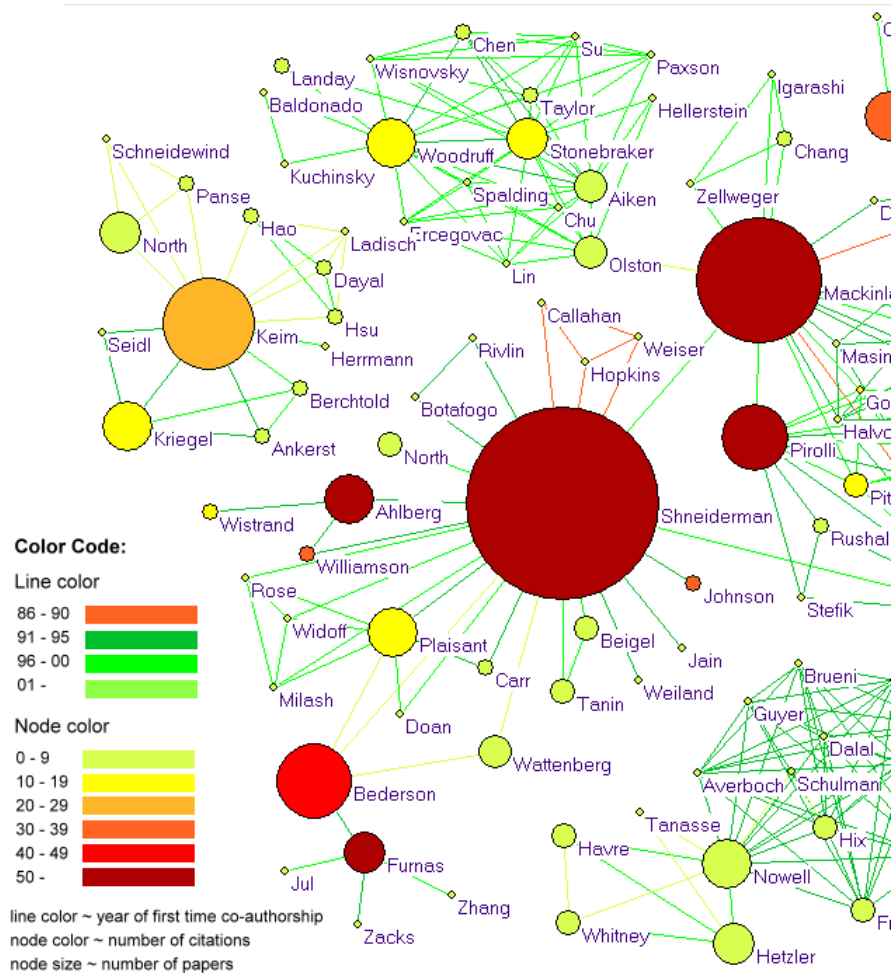
- Granularity levels
- Terminologies
- Scalability
- Disambiguation
- Provenance
- Temporality



## VIVO approach

- Make it easy to enter structured data
- Address trust via authoritative sources
- Address privacy via focus on public data

# Future versions of VIVO will:



Display visualizations of complex research networks and relationships.

Incorporate external data sources for publications and grants

Support easier customization and improved semantic search

Link data to external applications – e.g., to generate biosketches or CVs

Realize the immediate potential of the Semantic Web



# Get involved with VIVO

- As an:
  - adopter,
  - data provider, or
  - application developer
- Open source code (BSD), ontology, and conference information available at:



<http://vivoweb.org>

Thank you!

Questions?