



# Giving credit where it is due

how to make more meaningful connections between people, their roles, their work and impacts.

11 October 2018

Force2018

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@kristiholmes

# Acknowledgements

- Galter Library team
- Northwestern University Clinical and Translational Sciences Institute
- NU team: Karen Gutzman, Patty Smith, Sara Gonzales
- OHSU team: Marijane White, Nicole Vasilevsky, Melissa Haendel
- OpenVIVO collaborators
- Force11 Attribution WG
- NISO
- Cathy Sarli & Becker Library

<http://bit.ly/AttributionSignUp>



- ✓ Education & training
- ✓ Team Science
- ✓ Idea development
- ✓ Research process
- ✓ Communication
- ✓ Assessment & Improvement

# NUCATS

## From Discoveries to Health

Biomedical research exists on a continuum from early discovery to human trials to population health. These phases inform and influence one another, and each phase poses unique challenges and requirements. NUCATS resources and experts are available to support all of our partners across the continuum.



Basic Science



Pre-Clinical



Clinical Trials



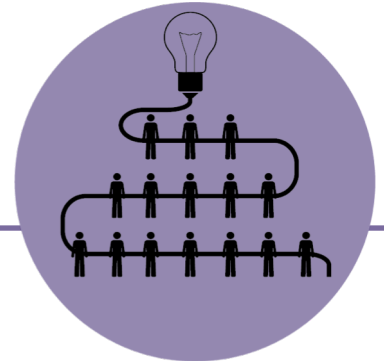
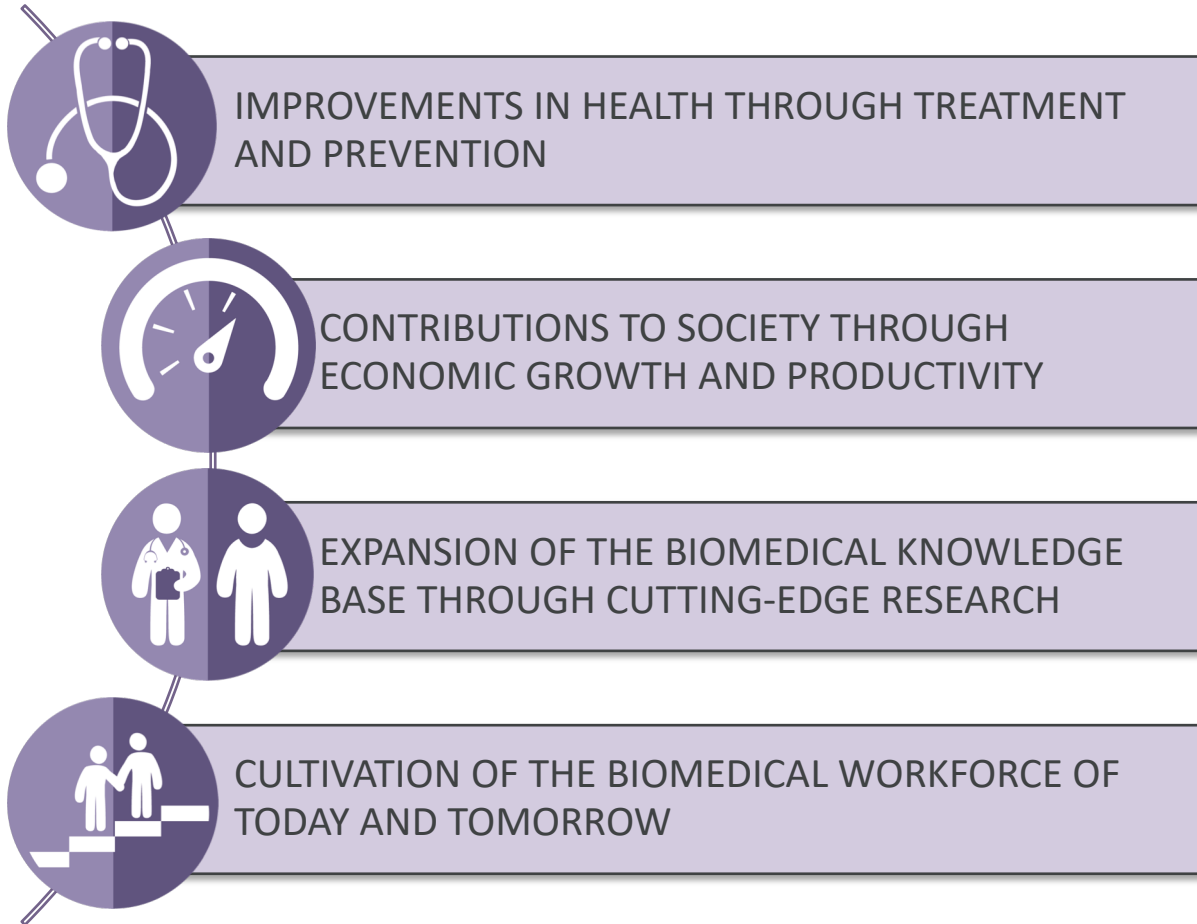
Translation to Practice



Population Health

# What IS impact?

More than papers and grants – driving toward improved health and wellbeing



For effective translation of knowledge and discoveries into the improved health of our communities, it is essential to incorporate evaluation strategies that enable investigators and teams to measure, monitor, and communicate the impact of their work



## Attribution

- Past work – it takes a village!
- Current work
  - What's next?
  - Research, more broadly
  - A social justice issue

Requirement: technology + data + culture

COMMENT

Writing

Nature 508, 312–313 (17 April 2014) doi:10.1038/508312a

Study conception

# Credit where credit is due

Liz Allen, Amy Brand, Jo Scott, Micah Altman and Marjorie Hlava are trialling digital taxonomies to help researchers to identify their contributions to collaborative projects.

Investigation

Formal analysis

Research today is rarely a one-person job. Original research papers with a single author are — particularly in

Through the endorsement of individuals' contributions, researchers can start to move beyond 'authorship' as the dominant measure of esteem. For funding agencies, better

journal articles could be classified using a 14-role taxonomy (see 'Who did what?'). The survey was sent to 1,200 corresponding authors of work published in PLOS journals, Nature Publishing Group journals, Elsevier

## CRedit

Workshop yesterday &  
<https://casrai.org/credit/>

CRT

CRedit is high-level taxonomy, including 14 roles, that can be used to represent the roles typically played by contributors to scientific scholarly output. The roles describe each contributor's specific contribution to the scholarly output.

# A journey with the FORCE11 community!



*Contribution and Attribution in the Context of the Scholar workshop, #Force2015, Oxford. Jan 2015*

*Measuring success through improved attribution panel, #VIVO15, Austin. Aug 2015*

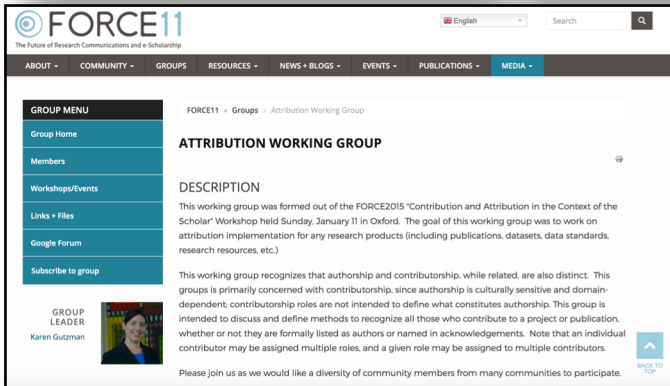
## Measuring Success Through Improved Attribution

Melissa Haendel – OHSU  
Stacy Konkiel – Allmetric.com  
Karen Guzman – Galer Library, Northwestern University  
Kristi Holmes – Galer Library, NUCATS, Northwestern University

14 August 2015 @ #VIVO15  
#VIVOcredit



*Using contributions and outputs to understand the scholarly ecosystem. In the OpenRIF Workshop, #Force2016, Portland. April 2016.*



**FORCE11**  
The Future of Research Communications and e-Scholarship

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GROUP MENU  
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GROUP LEADER  
Karen Guzman

FORCE11 - Groups - Attribution Working Group

### ATTRIBUTION WORKING GROUP

**DESCRIPTION**

This working group was formed out of the FORCE2015 "Contribution and Attribution in the Context of the Scholar" Workshop held Sunday, January 11 in Oxford. The goal of this working group was to work on attribution implementation for any research products (including publications, datasets, data standards, research resources, etc.)

This working group recognizes that authorship and contributorship, while related, are also distinct. This group is primarily concerned with contributorship, since authorship is culturally sensitive and domain-dependent; contributorship roles are not intended to define what constitutes authorship. This group is intended to discuss and define methods to recognize all those who contribute to a project or publication, whether or not they are formally listed as authors or named in acknowledgements. Note that an individual contributor may be assigned multiple roles, and a given role may be assigned to multiple contributors.

Please join us as we would like a diversity of community members from many communities to participate.



## OpenVIVO

Home People Organizations Research Events Capability Map

OpenVIVO is a demonstration of a VIVO anyone can join.

Browse or search information on research, people, and organizations.

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OpenVIVO is available to anyone who has a registered ORCID identifier.

Log in via ORCID

Search OpenVIVO

limit search Search

**Research**  
1,747 Academic Articles  
131 Books  
153 Chapters

**People**  
Emery, Jill  
Minson, Valrie

**Organizations**  
Bio Signal Group (United States)  
J.M. Kaplan Fund  
South Russian State Technical University

*OpenVIVO implementation at #FORCE2016*

# And other communities, too



MEMBER LOGIN



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- Events
- NISO I/O
- Standards Committees
- Standards & Publications

Home / Standards Committees

## NISO Alternative Assessment Metrics (Altmetrics) Initiative

In June 2013, the Alfred P. Sloan Foundation awarded NISO a grant to undertake a two-phase initiative to explore, identify, and advance standards and/or best practices related to a new suite of potential metrics in the community. This initiative was a direct outgrowth of a breakout discussion group during the [altmetrics 12](#) meeting in Chicago, IL. This project, which was accomplished in two phases, is seen as an important step in the development and adoption of new assessment metrics, which include usage-based metrics, social media references, and network behavioral analysis. The NISO Altmetrics Initiative also explored potential assessment criteria for non-traditional research outputs, such as data sets, visualizations, software, and other applications. The first phase, which took place from 2013-2014, exposed areas for potential standardization and the community collectively prioritized those potential projects. The second phase, which took place from 2014-2016, advanced work in several areas and developed those into recommended practices prioritized by the community and approved by the membership.

### Phase 2 Projects

NISO Voting Members reviewed and approved a [proposal](#) to develop several standards or recommended practices during Phase 2 of the Altmetrics Initiative. Areas/topics to be addressed are:

- Development of specific definitions for alternative assessment metrics – This working group will come up with specific definitions for the terms commonly used in alternative assessment metrics, enabling different stakeholders to talk about the same thing. This work will also lay the groundwork for the other working groups.
- Definitions for appropriate metrics and calculation methodologies for specific output



ALFRED P. SLOAN  
FOUNDATION

Recommended Practice

[NISO RP-25-2016 Outputs of the NISO Alternative Assessment Metrics Project](#)

September 14, 2016

- NISO Alternative Metrics Working Group – Output types and persistent identifiers
  - Co-chaired w/ Mike Taylor
  - Public comment (data citation, persistent identifiers, & alternative output types) followed by a recommended practice
- Other related projects
  - ACUMEN: Academic Careers Understood through Measurements and Norms
  - Research impact frameworks, assessment exercises, etc.

## Super classes of output types

- Publications
- Code and Software
- Publications
- Grey Literature
- Standards
- Basic Sciences
- Data
- Images, Diagrams, and Video
- Methodologies
- Event
- Education and Training
- Instruments, devices, inventions
- Regulatory, Compliance, and Legislation
- Industry
- Communications
- Capacity
- Other



# OpenVIVO

Implementation of a community-driven concept of credit.

The screenshot shows the OpenVIVO profile page for Kristi Holmes. The header includes the OpenVIVO logo, a search bar, and navigation links for Home, People, Organizations, Research, Events, and Capability Map. The profile section features a photo of Kristi Holmes, her name and title (Director, Galter Health Sciences Library & Associate Professor of Preventive Medicine–Health and Biomedical Informatics, Northwestern University), and a 'Publications in VIVO' chart showing 16 publications in the last 10 full years. Below this are sections for 'Positions' (Associate Professor at Northwestern University, Director of Evaluation at NUCATS, and Director at Galter Health Sciences Library), 'Contact Info' (kristi.holmes@northwestern.edu), 'Websites' (Kristi Holmes FSM Profile, Galter Health Sciences Library, NUCATS Evaluation & Continuous Improvement, Galter Library Metrics and Impact Core), and 'Research Areas' (Big data, Bioinformatics, Chemistry, Information science, Libraries, Linked data, Semantic Web).

*My own profile was completed entirely with publicly available data via ORCID and DOIs and it took about 15 minutes to complete from start to finish.*

<http://openvivo.org/>

1. Provide a VIVO experience for everyone, a demonstration of VIVO, a platform for experimentation, and an ownership experience for the VIVO team
2. Use persistent identifiers for all entities – people (ORCID), works (DOI and PMID), organizations (GRID), journals (ISSN), concepts (FAST)
3. Automatic, real-time ingest of metadata from identifiers via public APIs
4. Publication of data
5. Consumption and reuse of data
6. Attribution of works by scholars to indicate roles in works

*–Mike Conlon, VIVO Project Director*

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The editor and reviewers' affiliations are the latest provided on their Loop research profiles and may not reflect their situation at the time of review.

TECHNOLOGY REPORT ARTICLE

Front. Res. Metr. Anal., 01 March 2018 | <https://doi.org/10.3389/frma.2017.00012>



# OpenVIVO: Transparency in Scholarship

**Violeta Ilik<sup>1\*</sup>, Michael Conlon<sup>2</sup>, Graham Triggs<sup>3</sup>, Marijane White<sup>4</sup>, Muhammad Javed<sup>5</sup>, Matthew Brush<sup>4</sup>, Karen Gutzman<sup>6</sup>, Shahim Essaid<sup>4</sup>, Paul Friedman<sup>6</sup>, Simon Porter<sup>7</sup>, Martin Szomszor<sup>7</sup>, Melissa Anne Haendel<sup>4</sup>, David Eichmann<sup>8</sup> and Kristi L. Holmes<sup>6</sup>**

<sup>1</sup>Stony Brook University, Stony Brook, NY, United States

<sup>2</sup>University of Florida, Gainesville, FL, United States

<sup>3</sup>Duraspace, Beaverton, OR, United States

Download Article Export citation

2,096

TOTAL VIEWS

Am score 25

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<https://www.frontiersin.org/articles/10.3389/frma.2017.00012/full>

Articles

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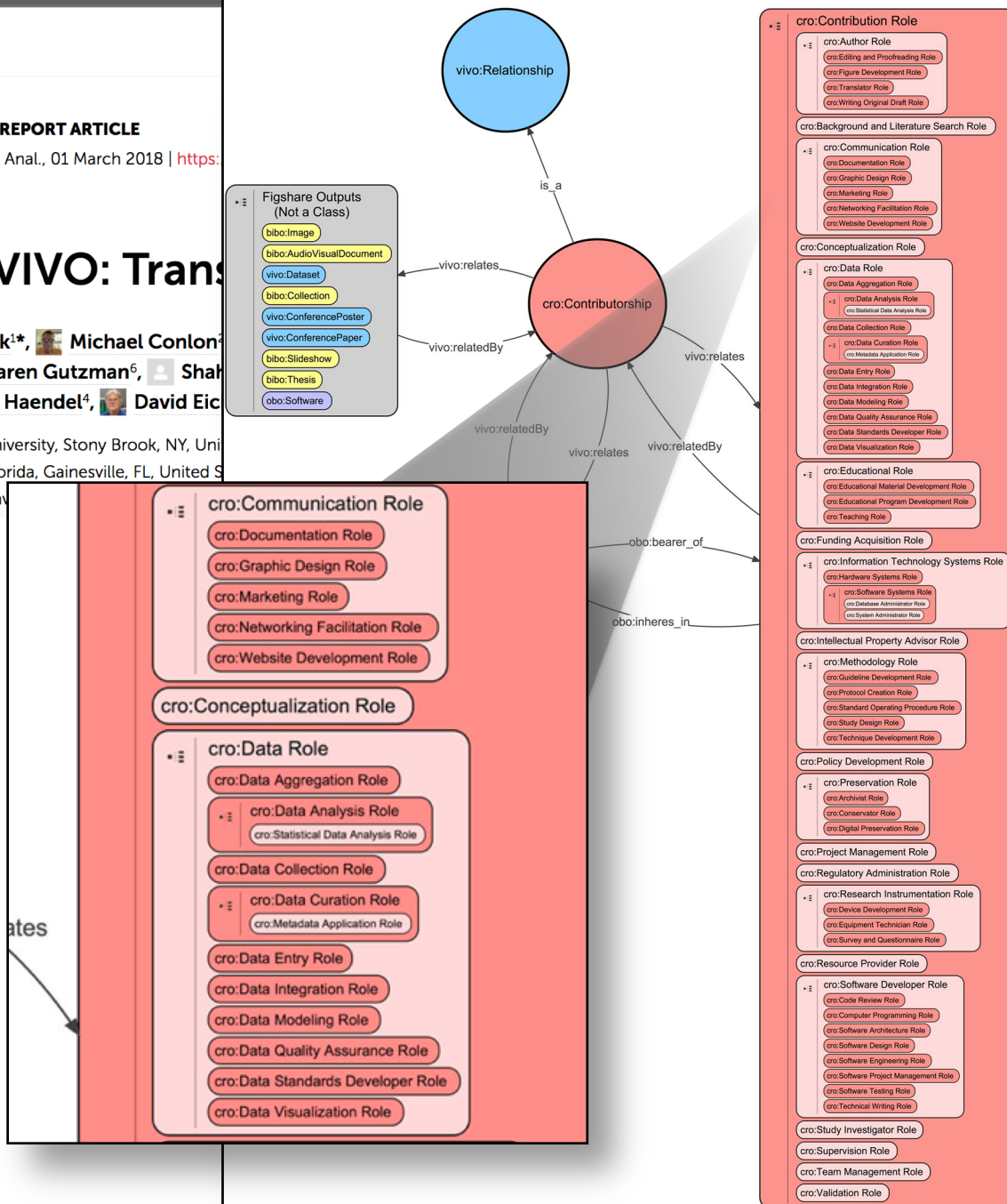
# OpenVIVO: Translating VIVO to Open Research Infrastructure

Violeta Ilik<sup>1\*</sup>, Michael Conlon<sup>2</sup>, Karen Gutzman<sup>6</sup>, Shaheen  
Brush<sup>4</sup>, Melissa Anne Haendel<sup>4</sup>, David Eick<sup>3</sup>

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<https://www.frontiersin.org/article/10.3389/frma.2017.00012/full>

## OpenRIF Contribution Role Ontology



us Data

Download Article Export citation

2,096 TOTAL VIEWS

Am score 25

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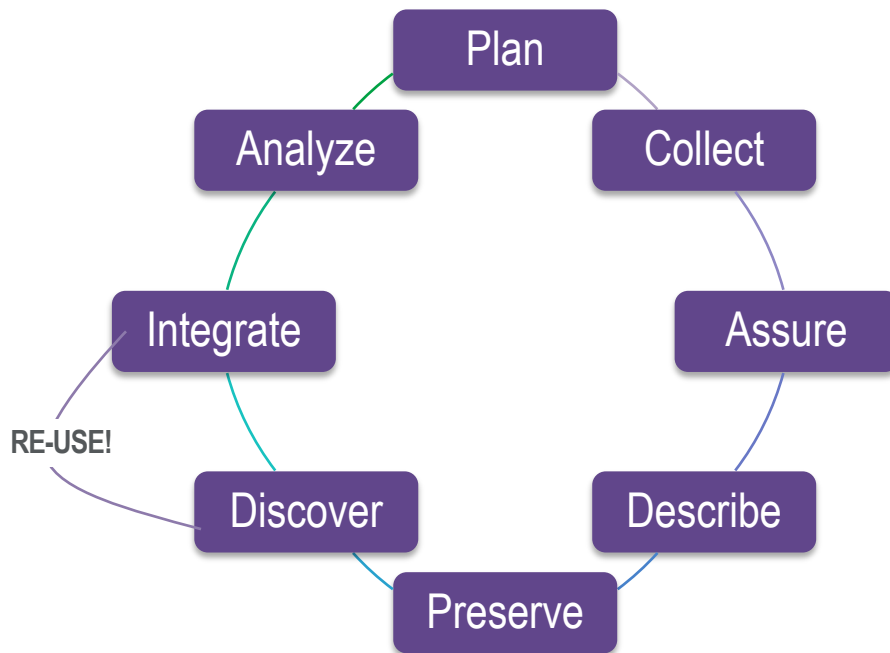
## Attribution

- Past work
- Current work - what's next?
  - Research, more broadly
  - A social justice issue

Requirement: technology + data + culture

# Research evolves and opens

What's needed to facilitate this and understand the impact?  
Involved diverse contributor roles and output types



## OPEN SCIENCE IMPROVES:

- **SPEED:** The research process becomes faster
- **EFFICIENCY:** Data collection can be funded once, and used many times for a variety of purposes
- **ACCESSIBILITY:** Anyone can access and build upon research resources with minimal barriers to access
- **IMPACT & LONGEVITY:** Open publications and data are more discoverable and receive more citations long-term
- **TRANSPARENCY & QUALITY:** The evidence that underpins research can be made open for anyone to scrutinize and replicate findings, leading to a more robust scholarly record

# National Center for Data to Health (CD2H)

<https://ctsa.ncats.nih.gov/cd2h/>



# Informatics in healthcare and clinical research are rapidly evolving to keep pace with technology advancements and new policies

## Old Way

- ◆ Siloed data
- ◆ Unimodal data
- ◆ Static or slowly evolving methods
- ◆ Bespoke tools

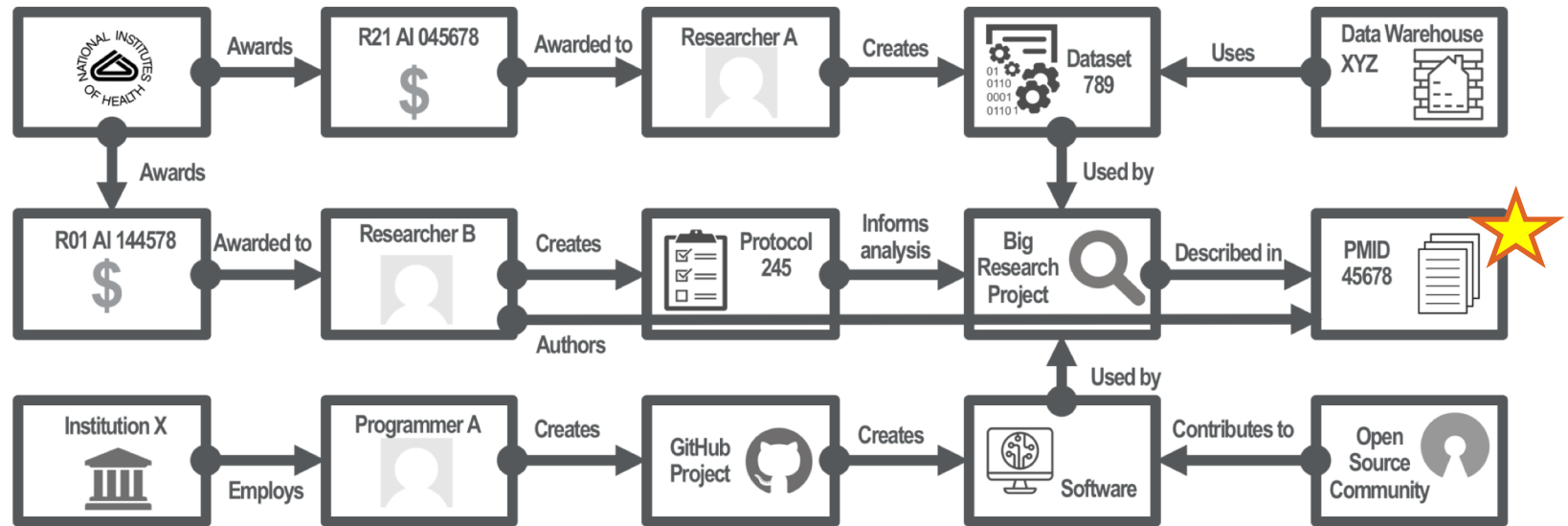


## New Way



- ◆ Data sharing
- ◆ Integrated, multimodal data
- ◆ Social coding & collaborative development
- ◆ Distributed & cloud computing

# Better attribution: extending credit beyond the publication to give credit where credit is due (researchers, communities, citizens, infrastructure, etc.)



Adapted from Julie McMurry

What work is being done, who is doing it, and what outputs are being created?

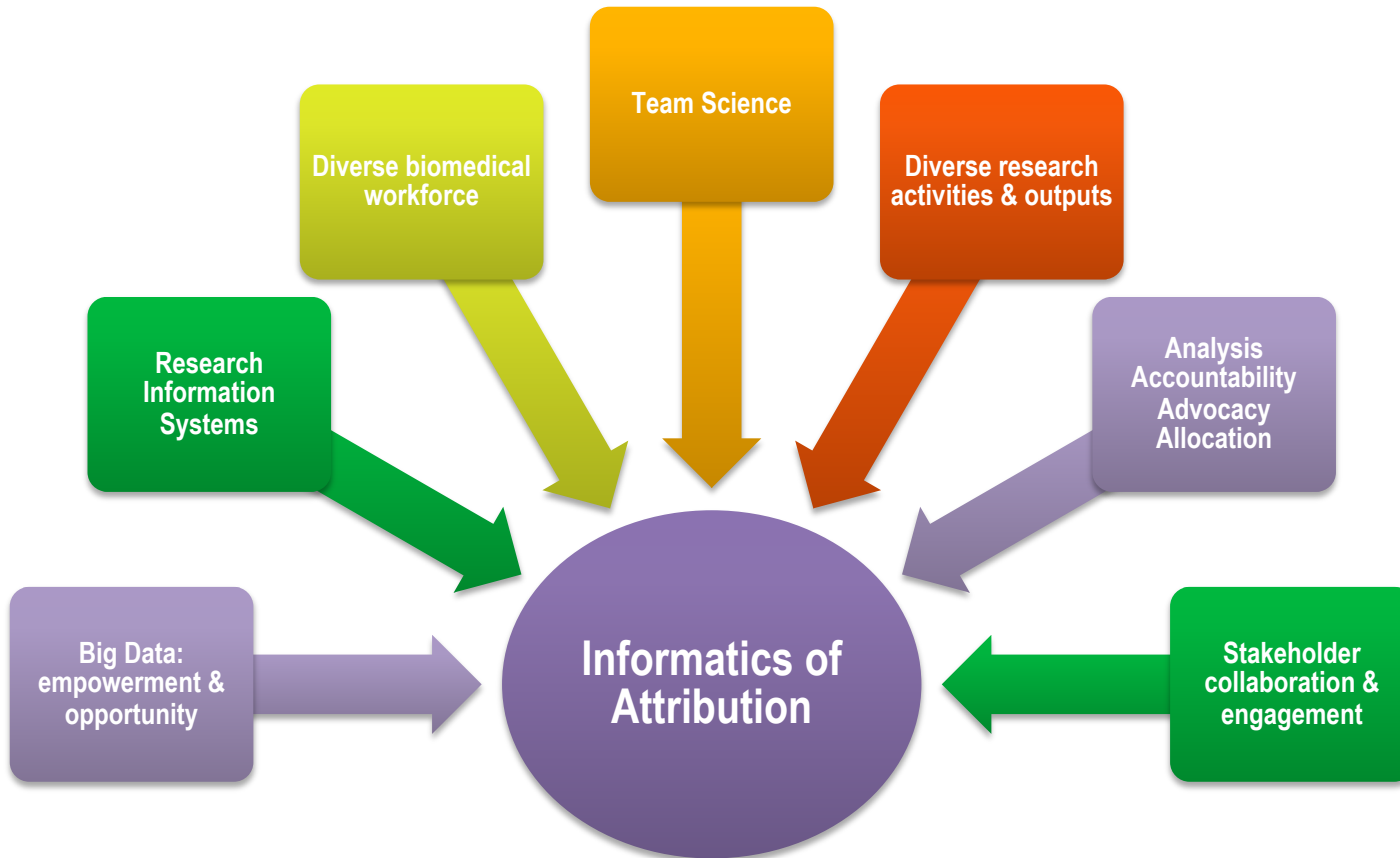
1. Understand deeply the requirements for a computable attribution system from a large diversity of stakeholders;
2. Build model(s) to meet these requirements (CRO, ROO);
3. Evaluate the models in real pilot systems with real data.

*By using contribution roles & research outputs to develop infrastructure to understand the scholarly ecosystem, we can better understand, leverage, and credit a diverse translational community*



# Why now & how do we get there?

<http://bit.ly/AttributionSignUp>



[http://www.rand.org/content/dam/rand/pubs/research\\_briefs/RB9700/RB9716/RAND\\_RB9716.pdf](http://www.rand.org/content/dam/rand/pubs/research_briefs/RB9700/RB9716/RAND_RB9716.pdf)



<http://www.nmbreakthroughs.org/medical-advances/the-scientists-behind-better-care>

Imperial College London

Academic writes 270 Wikipedia pages in a year to get female scientists noticed

Researcher Jess Wade says efforts to attract girls into science are not evidence-based - and are not working

Hannah Devlin Science correspondent

@hannahdev

Tue 24 Jul 2018 07:45 BST

53,144 869

This article is over 2 months old



The more you read about these sensational women, the more you get inspired by their personal stories, says Wade. Photograph: Graeme Robertson for the Guardian

Jess Wade is a scientist on a mission. She wants every woman who has achieved something impressive in science to get the prominence and recognition they deserve - starting with a Wikipedia entry.

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SCIENTISTS, DIVERSITY & WIKIPEDIA IMAGES



MissingSciFaces

@MissingSciFaces

Scientists, diversity & Wikipedia: getting photos & stories of women & other under-represented scientists in the public domain. (Tweets by @hildabas!)

missingscifaces.blog

# Celebrate the mathematics of Emmy Noether

*An algebra pioneer who faced discrimination deserves wider recognition on the centenary of her namesake theorem.*



**American Mathematical Society**  
@amermathsoc

Follow

“Emmy Noether was a force in mathematics — and knew it. She was fully confident in her capabilities and ideas. Yet a century on, those ideas, and their contribution to science, often go unnoticed.”

**Celebrate the mathematics of Emmy Noether**  
An algebra pioneer who faced discrimination deserves wider recognition on the centenary of her namesake theorem.  
[nature.com](https://www.nature.com)

6:42 PM - 12 Sep 2018

159 Retweets 293 Likes

8 159 293

Noether devoted her career to algebra and came to see it in a striking new light. “All of us like to rely on figures and formulas,” wrote Bartel van der Waerden, her former student, in his obituary of Noether. “She was concerned with concepts only, not with visualization or calculation.”

Noether saw maths as what are now called structures. To her, the characteristics of a structure’s components — be they numbers, polynomials or something else — mattered less than the networks of relations among an entire set of objects. This enabled her to give proofs that applied to more general structures than the original ones, and which revealed unseen connections.

It was a new and elegant approach that changed the face of algebra. And Noether realized that it could influence other parts of maths. One was topology, a field in which “she published half a sentence and has an everlasting effect”, one mathematician wrote. Before Noether, topologists had been counting holes in doughnuts; she brought to bear the full power of her structures to create something called algebraic topology.



<https://www.cancer.northwestern.edu/types-of-cancer/brain/index.html>



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## About ChicagoCHEC

Our **mission** is to advance **cancer health equity** through meaningful scientific discovery, education, training, and community engagement.

[Mission](#) [Background](#) [Impact](#) [Team](#) [Institutions](#) [Community Partners](#) [Cores](#)

### Requires

- *tri-institutional partnership and a focus on cancer health equity.*
- *collaborations with the community on cancer health equity issues.*

ChicagoCHEC Retweeted



Jen Brown @JenBrownARCC · Sep 21

All @chicagohec research includes community engagement, change driven by community question & energy. Community partnerships are powerful. @chicagohec Community Forum.



3 replies 5 likes



ChicagoCHEC @chicagohec · Sep 8

Joining the Mexican Consulate in their efforts to increase cancer education @UICancerCenter @NEIU @DrMelissaSimon @LurieCancer @NIH\_NCCIH



1 reply 5 likes

ChicagoCHEC @chicagohec · Aug 31

At the African Festival of Arts @UICancerCenter @NEIU @NIH\_NCCIH



2 likes

ChicagoCHEC Retweeted



Melissa Simon @DrMelissaSimon · Sep 21

It's lunch time at our @chicagohec #ChicagoCHEC student posters and grant resources for cancer ❤️



6 replies



ChicagoCHEC @chicagohec · Aug 30

Great start to UIC's CHER Chicago Community Symposium: Structural Violence & Health Equity.



2 replies 4 likes

ChicagoCHEC @chicagohec · Aug 15

at the Avondale neighborhood promoting cancer care @NEIU @UICancerCenter @UFeinbergMed @DrMelissaSimon @theNCl



3 likes



ChicagoCHEC @chicagohec · Sep 21

Survivor panel at the ChicagoCHEC Community Forum!!



2 replies 7 likes



**It takes technology & culture.**



# A next-gen integrated repository infrastructure



<http://ngr.coar-repositories.org/>



*Make the resource, rather than the repository, the focus of services and infrastructure*

## VISION

*A foundation for a **distributed, globally networked infrastructure** on top of which layers of **value added services** can be deployed, making it more **research-centric, open to and supportive of innovation**, while also **collectively managed by the scholarly community**.*

## GUIDING PRINCIPLES

- Distribution of control
- Inclusiveness and diversity
- Public good
- Intelligent openness and accessibility
- Sustainability
- Interoperability

# Institutional perspectives & new models

## Faculty Affairs Office

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*Feinberg Home > Home > For Administrators > Team Scientists*

### For Administrators

Annual Processes

Clinician-Educators

Investigators

**Team Scientists**

Research Faculty

Undifferentiated Track

Adjunct Faculty

Contributed Services Faculty

Coterminous Faculty

Health System Clinicians

## Team Scientists

The Team Scientist track is for non-clinical faculty who make substantial contributions to the research and/or educational missions of the medical school. Faculty members whose primary activity is in research will typically engage in team science. Their skills, expertise and/or effort play a vital role in obtaining, sustaining and implementing programmatic research.

Faculty on this track often have expertise in epidemiology, clinical trials, biostatistics, biomedical informatics, outcomes research or other qualitative and quantitative research methodologies and generally contribute to clinical studies, patient-oriented clinical outcomes research, community-engaged research, population-based studies and/or basic science research. Typically, such faculty provide critical expertise to a program or group of research teams as a co-investigator with contributions that do not necessarily require or result in independent grant funding, but some faculty on this track may serve as principal investigator on related research. Faculty on this track do not perform clinical work but do contribute to the education and service missions of the medical school.

While most members of this track make research the major focus of their activity, for some members of this track education may be the major focus of their activity. Faculty focusing on education are typically recognized as outstanding educators and contribute to course development, degree program leadership and other innovative educational products.

For more information, view the  [Information Guide for Appointments, Promotion and Tenure \(PDF\)](#).

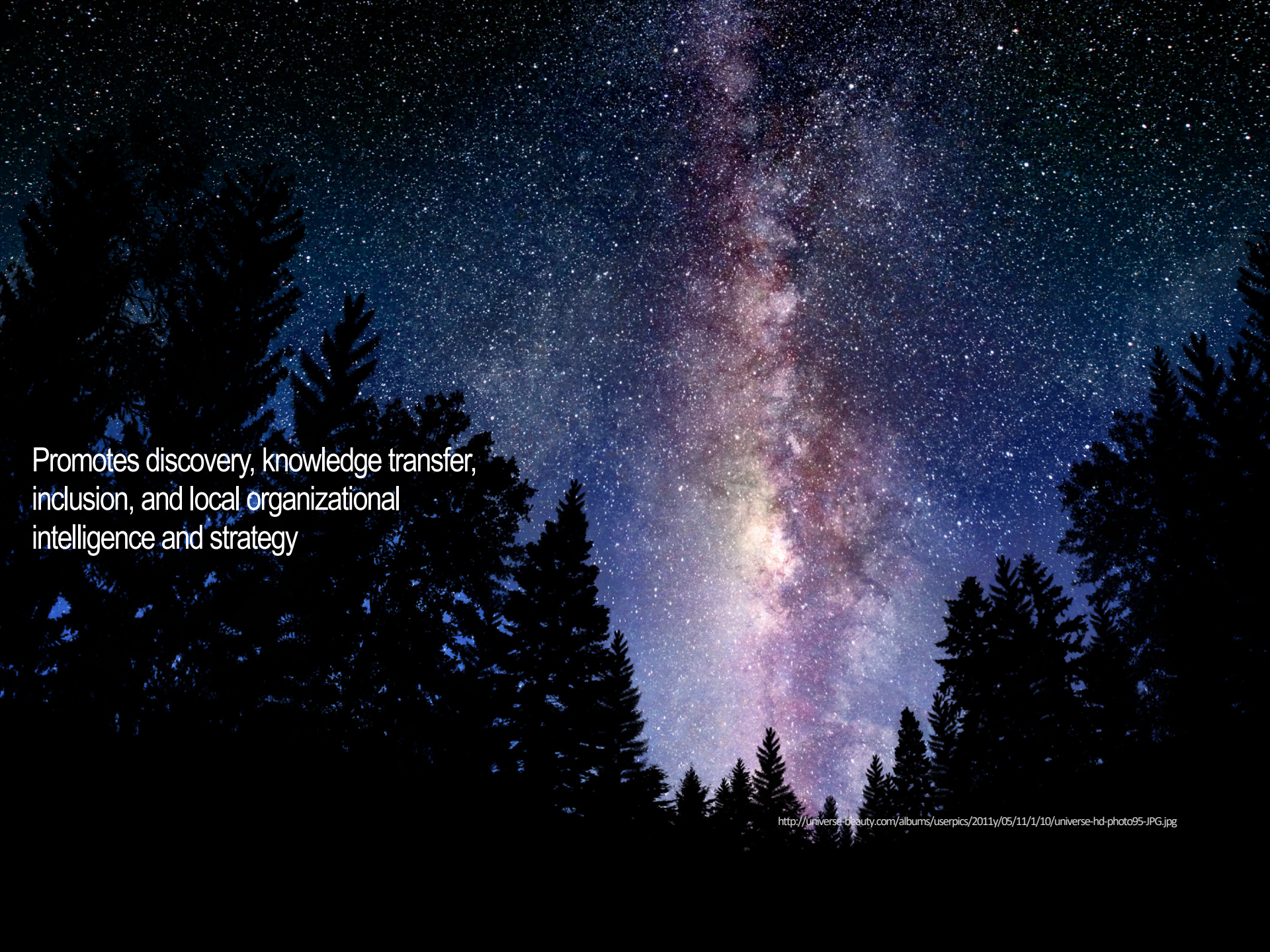
### Team Scientist Ranks

# Institutional perspectives & new models

## Northwestern's Team Scientist Faculty Track

- 2015: a new “Team Scientist” track was established within our regular faculty lines to better value such scientists’ contributions.
- Collaborative effort between NUCATS (Lloyd-Jones), Vice Dean for Faculty Affairs at Feinberg (Lowe), and relevant stakeholders.
- Enthusiasm on campus by collaborative scientists, successful promotion pathway
- Collaborative scientists who span content disciplines at NU now have several distinct pathways for promotion with clear metrics through our tenure-eligible, non-tenure-eligible, and research faculty lines.

Team Scientist Faculty Track Survey Results	
	SATISFIED
Overall satisfaction with current position	74%
Opportunity to collaborate with other faculty	90%
Sense of contributing to important research	83%
Contributions are acknowledged via co-authorships	80%
Promotion process is clear and transparent	68%
Fall, 2017 survey response rate: 81%	



Promotes discovery, knowledge transfer,  
inclusion, and local organizational  
intelligence and strategy

# acknowledgements

- Teams
  - Galter Library, NUCATS, ChicagoCHEC, FIRST DailyLife, Health for All, CD2H
- NIH Support
  - UL1TR001422 (NCATS)
  - U54CA202995, U54CA202997, and U54CA203000 (NCI)
  - P30AR072579 (NIAMS)
  - G08LM012688 (NLM)
  - U24TR002306 (NCATS)



<b>Term</b>	<b>Definition (CRediT)</b>
<b>Conceptualization</b>	Ideas; formulation or evolution of overarching research goals and aims.
<b>Methodology</b>	Development or design of methodology; creation of models.
<b>Software</b>	Programming, software development; designing computer programs; implementation of the computer code and supporting algorithms; testing of existing code components.
<b>Validation</b>	Verification, whether as a part of the activity or separate, of the overall replication/reproducibility of results/experiments and other research outputs.
<b>Formal Analysis</b>	Application of statistical, mathematical, computational, or other formal techniques to analyse or synthesize study data.
<b>Investigation</b>	Conducting a research and investigation process, specifically performing the experiments, or data/evidence collection.
<b>Resources</b>	Provision of study materials, reagents, materials, patients, laboratory samples, animals, instrumentation, computing resources, or other analysis tools.
<b>Data Curation</b>	Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and later re-use.
<b>Writing – Original Draft</b>	Preparation, creation and/or presentation of the published work, specifically writing the initial draft (including substantive translation).
<b>Writing – Review &amp; Editing</b>	Preparation, creation and/or presentation of the published work by those from the original research group, specifically critical review, commentary or revision – including pre- or post-publication stages.
<b>Visualization</b>	Preparation, creation and/or presentation of the published work, specifically visualization/data presentation.
<b>Supervision</b>	Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team.
<b>Project Administration</b>	Management and coordination responsibility for the research activity planning and execution.
<b>Funding Acquisition</b>	Acquisition of the financial support for the project leading to this publication.

- National Information Standards Organization. Outputs of the NISO Alternative Assessment Metrics Project. 2016. Report No.: Recommended Practice RP-25-2016.
- Sarli CC, Dubinsky EK, Holmes KL. Beyond citation analysis: a model for assessment of research impact. J Med Libr Assoc. 2010; 98(1):17-23. PMID: 20098647; PMCID: PMC2801963.
- Gutzman KE, Konkiel S, White M, et al. Attribution of Work in the Scholarly Ecosystem 2016. Available from: [https://figshare.com/articles/Attribution\\_of\\_Work\\_in\\_the\\_Scholarly\\_Ecosystem/3175198](https://figshare.com/articles/Attribution_of_Work_in_the_Scholarly_Ecosystem/3175198) .
- White M, Haendel M, Brush M. Contribution Ontology: A repository for representation of a person's role in research processes and outputs [Data model]. 2016 Available from: <https://github.com/openrif/contribution-ontology>
- European Commission Directorate-General for Research and Innovation, Open Science Working Group on Rewards/Recognition. Evaluation of Research Careers fully acknowledging Open Science Practices: Rewards, incentives and/or recognition for researchers practicing Open Science [Report].. Brussels, Belgium: European Commission; 2017. Available from: [https://ec.europa.eu/research/openscience/pdf/os\\_rewards\\_wgreport.pdf](https://ec.europa.eu/research/openscience/pdf/os_rewards_wgreport.pdf) - view=fit&pagemode=none
- Alberta Innovates - Health Solutions. Annual Impact Report: 2014-15 Alberta, Canada: Alberta Innovates - Health Solutions; 2016. Available from: <http://www.aihealthsolutions.ca/media/Annual-Impact-Report-2014-2015.pdf>
- Becker Medical Library Model for Assessment of Research Impact. St. Louis, MO: Bernard Becker Medical Library; 2014. Available from: <https://becker.wustl.edu/impact-assessment>

# Links to selected resources and projects

- National Center for Advancing Translational Sciences: <https://ncats.nih.gov/>
- Clinical and Translational Science Award (CTSA) Program: <https://ctsacentral.org/>
- Northwestern University Clinical and Translational Sciences Institute: <https://nucats.northwestern.edu/>
- OpenVIVO: <http://openvivo.org/> and <https://wiki.duraspace.org/display/VIVO/OpenVIVO+Task+Force>
- CD2H: <https://ctsa.ncats.nih.gov/cd2h/> and <https://github.com/data2health>
- FORCE11 Attribution Working Group: <https://www.force11.org/group/attributionwg>
- COAR: <https://www.coar-repositories.org/>
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