

Federal open science

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That ideas should freely spread from one to another over the globe, for the moral and mutual instruction of man, and improvement of his condition, seems to have been peculiarly and benevolently designed by nature, when she made them, like fire, expansible over all space, without lessening their density in any point; and like the air in which we breathe, move, and have our physical being, incapable of confinement, or exclusive appropriation.

Th. Jefferson

Thomas Jefferson to Isaac McPherson, 13 August 1813," *Founders Online*, National Archives, last modified December 28, 2016, <http://founders.archives.gov/documents/Jefferson/03-06-02-0322>. [Original source: *The Papers of Thomas Jefferson*, Retirement Series, vol. 6, 11 March to 27 November 1813, ed. J. Jefferson Looney. Princeton: Princeton University Press, 2009, pp. 379–386.]

Toward Open Science

WHAT?

- Principle and practice of making the results of scientific research available, accessible, and usable

WHY?

- Accelerate science
- Improve rigor and reproducibility of research
- Spur innovation
- Strengthen the economy
- Increase the return on investment in research

HOW?

- Funder policies for increased public accessibility of research outputs
- Rewards and recognition for open science practice – incentives, culture change
- Systems and tools that enable good practice

Interagency Working Group on Open Science

CHARTER
of the
INTERAGENCY WORKING GROUP ON OPEN SCIENCE
COMMITTEE ON SCIENCE
NATIONAL SCIENCE AND TECHNOLOGY COUNCIL

A. Official Designation

The Interagency Working Group on Open Science (IWGOS) is hereby established by action of the National Science and Technology Council (NSTC), Committee on Science (CoS).

B. Purpose and Scope

The purpose of the IWGOS is to advance Federal efforts to support open science by making the results of Federally funded scientific research more accessible and useful to the public, industry, and the scientific community. Such results shall include scholarly publications and digital data. The IWGOS will aim to build upon and extend the progress that departments and agencies have made to date in implementing plans to meet the objectives of the February 22, 2013 Memorandum from the Director of the Office of Science and Technology Policy (OSTP) on Increasing Access to the Results of Federally Funded Scientific Research (Public Access Memo).¹ The IWGOS will also identify additional steps to improve the preservation, discoverability, accessibility, and usability of the outputs of, and data supporting, Federally funded scientific research, with the aims of bolstering the reliability of research, accelerating scientific discovery, stimulating innovation, promoting entrepreneurship, and enhancing economic growth and job creation, consistent with agency missions and capabilities.

C. Functions

The functions of the IWGOS are to:

1. Promote the exchange of information about agency policies and practices for increasing access to scholarly publications and digital data consistent with the objectives of the Public Access Memo,
2. Facilitate interagency coordination and cooperation on topics of common interest related to open science.

¹ See https://www.whitehouse.gov/sites/default/files/microsites/ostp/ostp_public_access_memo_2013.pdf

- **Exchange information** on implementation of public access policies and practices
- **Facilitate interagency coordination** and cooperation on open science
- **Recommend additional objectives** for Federal open science policies
- **Outline effective strategies** for improving preservation, discoverability, and accessibility of scientific data
- **Identify effective approaches** for data preservation & access; assess requirements for scaling up; and identify gaps
- **Facilitate coordination** of training, education, and workforce development
- **Liaise** with other NSTC groups
- **Identify opportunities** for international communication and collaboration

IWGOS Member Departments & Agencies

Department of Agriculture

<http://www.usda.gov/documents/USDA-Public-Access-Implementation-Plan.pdf>

Department of Defense

http://www.dtic.mil/dtic/pdf/dod_public_access_plan_feb2015.pdf

Department of Education

<https://ies.ed.gov/funding/pdf/EDPlanPolicyDevelopmentGuidanceforPublicAccess.pdf>

Department of Energy

http://energy.gov/sites/prod/files/2014/08/f18/DOE_Public_Access%20Plan_FINAL.pdf

Department of Health & Human Services

<http://www.hhs.gov/open/public-access-guiding-principles/index.html>

- **Administration for Community Living**
<http://www.acl.gov/Programs/NIDILRR/docs/ACL-PublicAccessPlan-Jan2016.pdf>
- **Agency for Health Research & Quality**
<http://www.ahrq.gov/funding/policies/publicaccess/index.html>
- **Assistant Secretary for Preparedness & Response**
<http://www.phe.gov/Preparedness/planning/science/Pages/AccessPlan.aspx>
- **Centers for Disease Control**
http://www.cdc.gov/od/science/docs/Final-CDC-Public-Access-Plan-Jan-2015_508-Compliant.pdf
- **Food & Drug Administration**
<http://www.fda.gov/downloads/ScienceResearch/AboutScienceResearchatFDA/UCM435418.pdf>
- **National Institutes of Health**
<http://grants.nih.gov/grants/NIH-Public-Access-Plan.pdf>

Department of Homeland Security

<https://www.dhs.gov/publication/plan-support-increased-public-access-results-research-funded-federal-government>

Department of Transportation

<https://www.transportation.gov/open/official-dot-public-access-plan>

Department of Veterans Affairs

http://www.va.gov/ORO/Docs/Guidance/Plan_for_Access_to_Results_of_VA_Funded_Rsch_02_14_2014.pdf

Agency for International Development

<https://www.usaid.gov/sites/default/files/documents/15396/USAIDPublicAccessPlan.pdf>

Environmental Protection Agency

<https://www.epa.gov/sites/production/files/2016-12/documents/epascientificresearchtransparencyplan.pdf>

National Institute of Standards & Technology

<http://www.nist.gov/open/upload/NIST-Plan-for-Public-Access.pdf>

National Aeronautics and Space Administration

http://science.nasa.gov/media/medialibrary/2014/12/05/NASA_Plan_for_increasing_access_to_results_of_federally_funded_research.pdf

National Oceanic and Atmospheric Administration

http://docs.lib.noaa.gov/noaa_documents/NOAA_Research_Council/NOAA_PARR_Plan_v5.04.pdf

National Science Foundation

<http://www.nsf.gov/pubs/2015/nsf15052/nsf15052.pdf>

Office of the Director of National Intelligence

https://www.iarpa.gov/images/files/Documents/ODNI%20Public%20Access%20Plan_Sept%202016.pdf

Smithsonian Institution

http://public.media.smithsonianmag.com//file_upload_plugin/1f143b54-a9f9-4746-bef5-1c76151e3c7a.pdf

U.S. Geological Survey

http://www.usgs.gov/quality_integrity/open_access/default.asp

Institute for Museum & Library Services

Interagency Working Group on Open Data Sharing Policy

Principles for Promoting Access to Federal Government-Supported Scientific Data and Research Findings Through International Scientific Cooperation

1. Scientific progress and collaboration benefit from an early and continuing commitment to the establishment, description, curation, maintenance, validation, discoverability, accessibility, and distribution of scientific data.
2. Scientific data should be made openly accessible to the extent permitted by law and subject to privacy, confidentiality, security, and other appropriate restrictions (e.g., recognizing proprietary interests, business confidential information, and intellectual property rights).
3. Government-supported scientific data should be available without charge whenever feasible.
4. Partners in international science and technology cooperative activities should establish a data management plan at project initiation that considers the full data lifecycle for scientific data.
5. Federal agencies should encourage technical and legal interoperability to facilitate international sharing of government-supported scientific data, using compatible, publicly available and open source formats.
6. Government-supported scientific data (and publications) should be made available as early as possible, with the timing of release and the duration of any exclusive-use period explicitly defined.
7. Federal agencies should work with international science and technology partners to adopt policies and data standards that encourage open sharing of data for collaborative activities.

Public access to papers and data at NIH

Neil Thakur

Office of Extramural Research

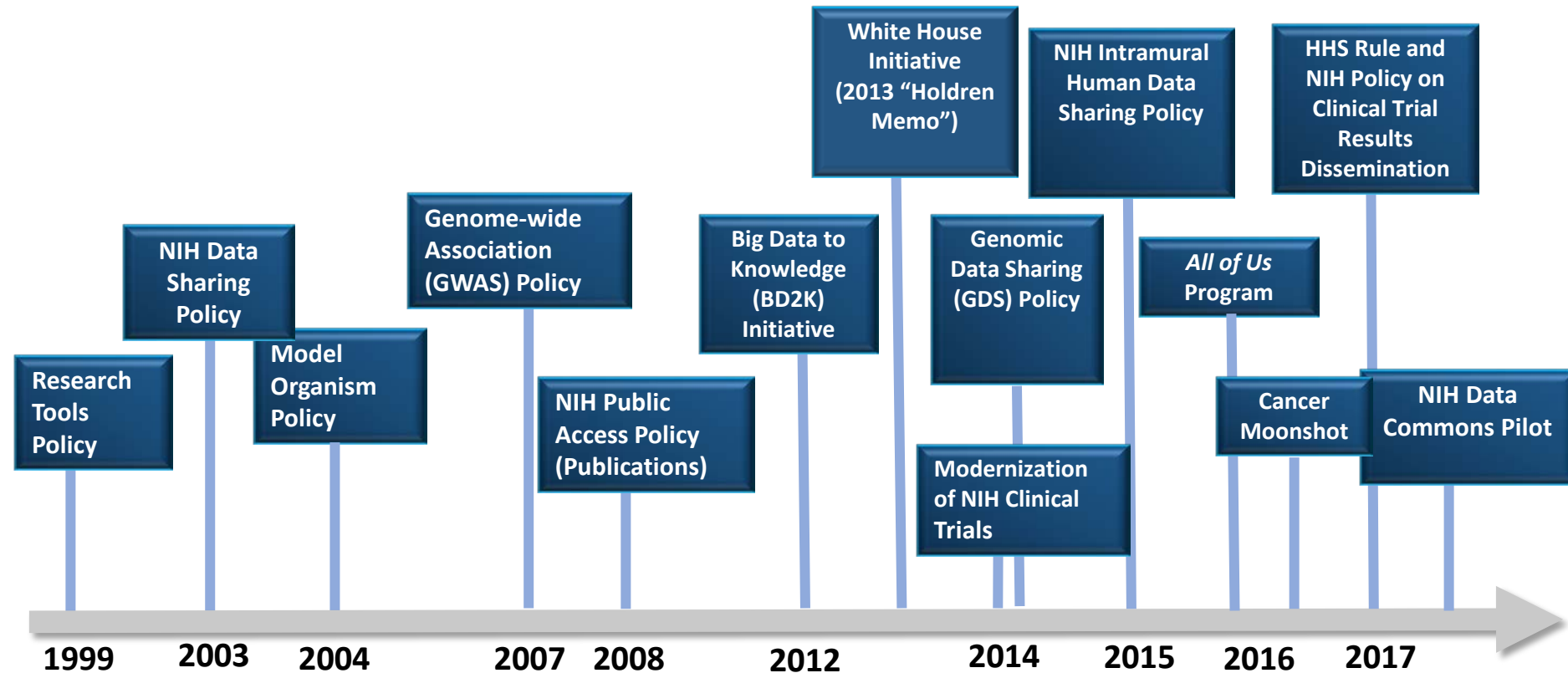
Dina Paltoo

Office of Science Policy

NIH: Public access to publications

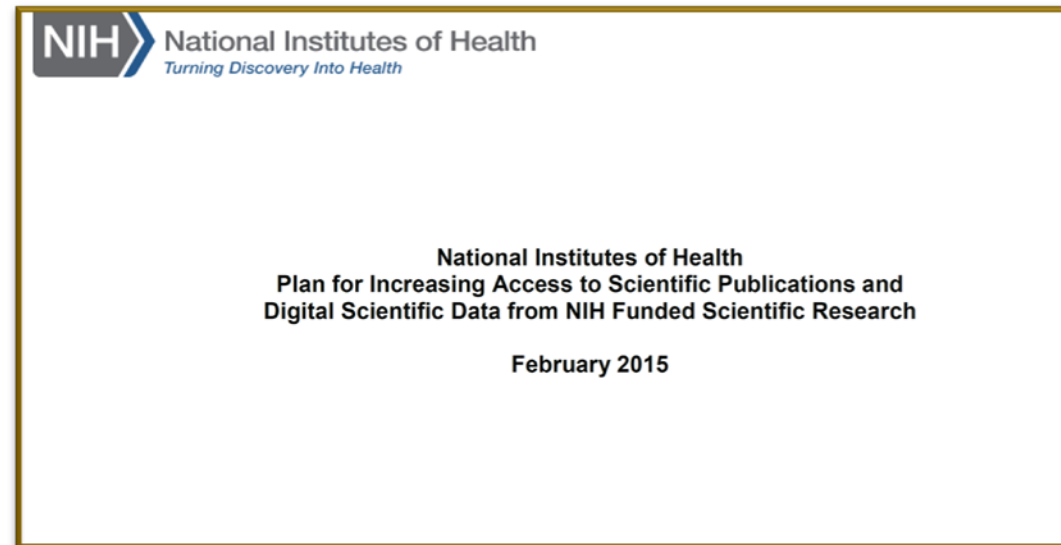
- Mandatory policy since 2008 (<https://publicaccess.nih.gov/index.htm>)
 - Requires papers to be posted to PubMed Central
 - High visibility for your faculty: as of 5/17, posted 795K NIH papers, accessed by 18.9M unique IPs per month
 - Compliance: ~88%
- Partnerships
 - Over 6000 journals send some or all final published articles to PMC
 - Funders using PubMed Central as their archive:
 - Government: NIH, ACL, AHRQ, CDC, DHS, EPA, FDA, NASA, NIST, ASPR, VA (<https://www.ncbi.nlm.nih.gov/pmc/about/public-access/>)
 - Other: HHMI, Gates; many British and European funders use Europe PMC and share content (<https://www.ncbi.nlm.nih.gov/pmc/about/pmci/>)

NIH's Culture of Data Sharing



Increasing Access to Publications and Digital Scientific Data

February 2015: “NIH Plan” released



Plan ≠ Policy; NIH to establish priorities for data stewardship

RFI on Strategies for NIH Data Management, Sharing, and Citation (NOT-OD-17-015)

- **Released November 14, 2016 for a 45 day comment period**
 - The “Who, what, when, where, and whys” of data management and sharing, and barriers to overcome challenges
 - Importance of data and software citation in NIH reports and funding applications
- **Comments: Data Sharing Strategy Development**
 - Any data needed to replicate a study should be shared
 - Data should be made available for secondary research purposes for a minimum of 10 years
 - A culture of sharing that would incentivize and encourage data sharing is needed
- **Comments: Inclusion of Data and Software Citation in NIH Research Performance Progress Reports (RPPR) and Grant Applications**
 - Citations should include global persistent unique identifiers (to incentivize data sharing and allow for attribution)
- **General comment**
 - NIH should discourage the use of proprietary software for uploaded/shared data



Considerations for NIH Policy Development

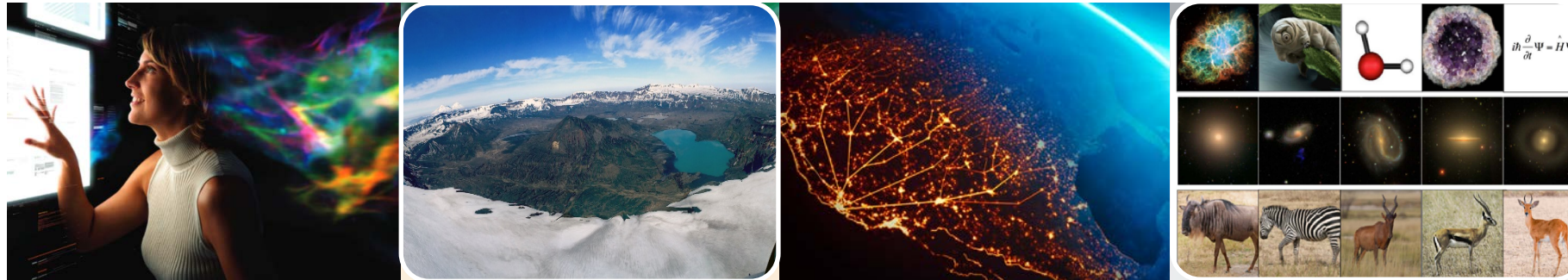
- **Definitions, Scope and Applicability, and existing NIH data sharing policies**
- **Requirements**
 - Data Management and Sharing Plans
 - Require in funding applications
 - Evaluate during peer review
 - Structured format, updateable, publicly available (e.g., RePORTER)
 - Contingency plans
 - Data sharing exceptions
 - Data Sharing (e.g., NIH authorities under 21st Century Cures Act)
- **Request budget in funding application**
- **Mechanisms for compliance and enforcement**
- **Next Steps: release draft Policy for public comment**

Today a Draft Policy, tomorrow the world...

- **Data sharing policy – we need to get there...**
- **Valuable data**
 - NIH-NSF SciSIP Workshop on the Value of Data Sharing
- **Policy \neq Implementation**
- **Maximizing value of info gathered from public feedback**
 - Importance of outreach, communication



National Science Foundation Public Access



Beth Plale, PhD
Science Advisor for Public Access
National Science Foundation

COGR
October 25, 2017



NSF Public Access and Publications

NSF Public Access Plan (Mar 2015)

- Continues NSF commitment to expand public access to the results of its funded research



NSF Public Access Repository online (par.nsf.gov)

- Provide public access to journal, juried conference papers
- PI's must deposit publications in PAR, awards made FY 2016 onwards
- Publications reported as part of normal reporting process



NSF Public Access and data

- “Data management is dynamic and practices vary substantially across the broad range of scientific disciplines supported by NSF” [NSF 15-52]
- “What constitutes reasonable data management and access will be determined by the community of interest *through the process of peer review and program management.*” [Data Management & Sharing Frequently Asked Questions]
- Top-down guiding principles; Bottom-up implementation
 - *“one size” does not fit all* of science and engineering



NSF Data Management Plan



- Data Management Plan (DMP) required as part of grant proposal package (2011)
- DMPs reviewed as part of merit review process
 - For some, DMP is heart of proposal
- Directorates and community have considerable latitude in defining data sharing subject to
 - Applicable law and policy; agency mission; resource constraints
 - Stored and publicly accessible to search, retrieve, and analyze
 - *e.g.*, available in community repository, institutional repository, web server, journal ...



Conclusion

Bottom-up implementation, top-down guiding principles implemented as:

- Proposal & Award Policies & Procedures Guide (PAPPG)
 - Chapter XI.D.4 (Intellectual Property: Dissemination and Sharing of Research Results)
- NSF Public Access plan (NSF 15-052):
 - https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf15052
- Directorate, divisional DMP guidance
 - <https://www.nsf.gov/bfa/dias/policy/dmp.jsp>
- Individual solicitations



NIH Public Access to Publications, in one slide

- The NIH Public Access Policy requires that all peer-reviewed journal articles arising from NIH funds are posted to [PubMed Central](#)
- You must have evidence of compliance with the public access policy for all peer-reviewed papers *upon acceptance for publication*
- Be proactive to maintain your funding!
 - Develop your compliance plan while you are preparing your manuscript.
 - How you comply and report compliance depends on the journal you choose.
 - Use our [public access instruction wizard](#) to develop your plan
- NIH wants people to see your work. Over one million people per day use PubMed Central to retrieve more than two million papers to advance research, innovation, education and health.
- For more information, see <http://publicaccess.nih.gov/> and <https://publicaccess.nih.gov/sponsored-programs.htm>

Advice from NIH: How to monitor compliance at your institution



Public Access Compliance Monitor

The Public Access Compliance Monitor (or PACM) is a database of articles associated with an institution's (i.e., IPF's) grants and organized by their compliance status with the NIH Public Access Policy.



Provides
global view
of ALL papers
associated
with awards
made to your
institution



Provides
article-level
data
(identifiers,
key dates,
compliance
status, etc.)

<https://www.ncbi.nlm.nih.gov/pmc/utils/pacm/>

Is the Compliance Monitor the right tool for you?



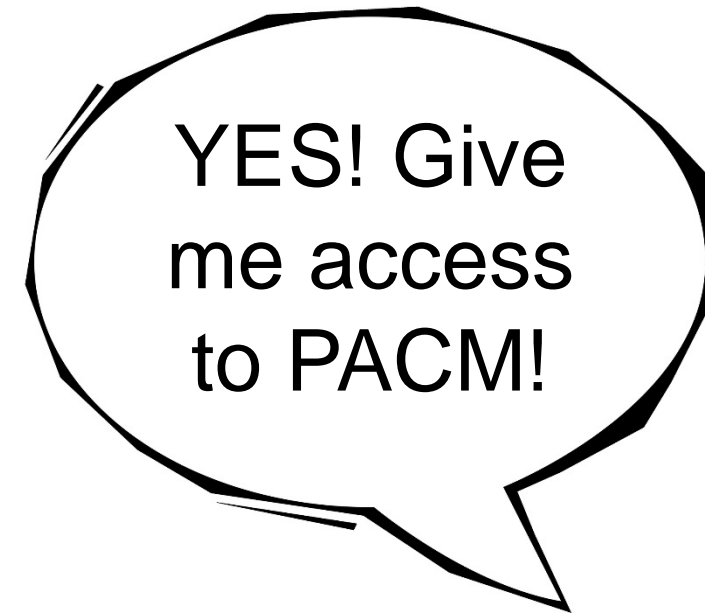
You monitor the compliance of a number of awards.



You want to provide different departments with compliance status reports.

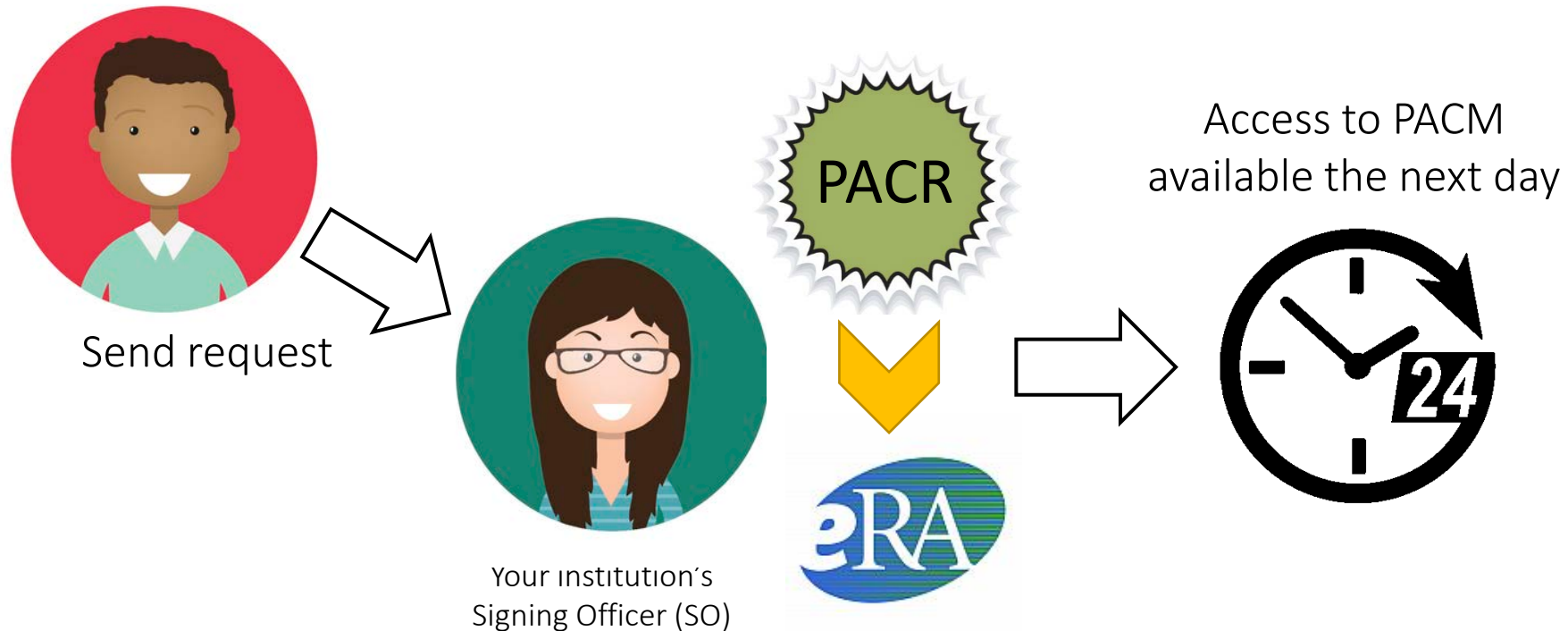


You want to quickly check the compliance of a specific paper.



<https://www.ncbi.nlm.nih.gov/pmc/utils/pacm/>

Gaining Access to the Compliance Monitor



<https://www.ncbi.nlm.nih.gov/pmc/utils/pacm/>