Introduction to dkNET: the NIDDK Information Network

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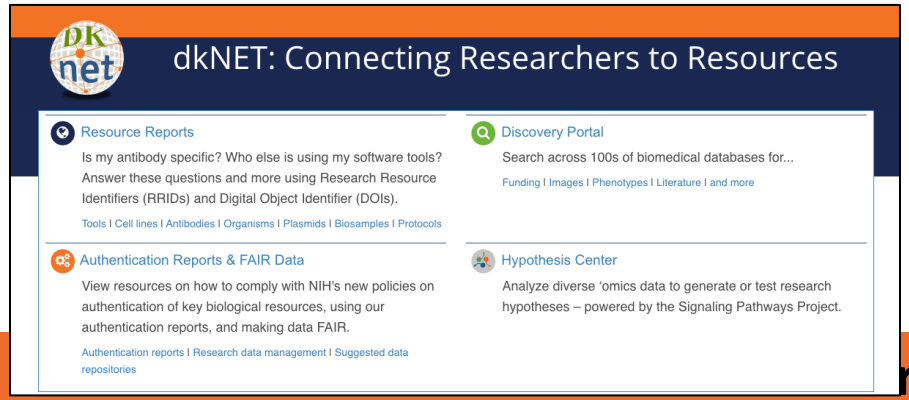
2022 CAIRIBU Meeting

What is dkNET?

- dkNET provides a single point of access to information about diverse research resources, including **data, information, materials, tools, funding opportunities, literature, services, events, news,** and **projects** that advance the mission of the NIDDK.

- dkNET provides tools and services in support of **rigor and reproducibility**, built around the Research Resource Identifier (**RRID**) and the **FAIR data principles** (Findable, Accessible, Interoperable, Re-usable).

https://dknet.org

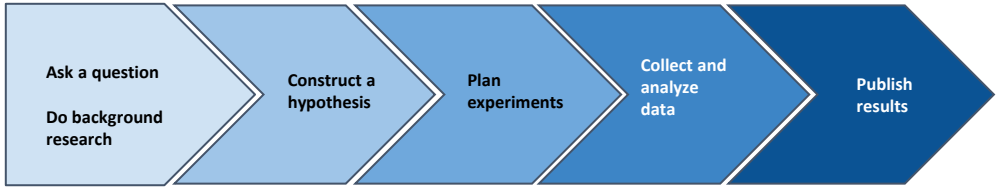


dkNET's Tools, Services, and Programs

Impact	dkNET Tools, Services and Programs
Findability, rigor and reproducibility of research resources	• Resource Reports • Authentication Reports
Increase computational skills among the National Institute of Diabetes, Digestive and Kidney Diseases (NIDDK) workforce	• Hypothesis Center • dkNET New Investigator Pilot Program in Bioinformatics • D-Challenge • Webinar series
Bring open and FAIR data practices to DK researchers	• DK Repositories for data sharing • Webinar series • Data management and sharing plans • Summer of Data student program

5 AREAS IN THE PORTAL

- **Resource Reports:** helps researchers find and evaluate resources
- **Authentication Reports:** assists researchers in preparing NIH authentication plans
- **FAIR Data Services:** assists researchers in finding data repositories and standards for preparing data management plans
- **Discovery Portal:** connects researchers to more than 200 biomedical databases
- **Hypothesis Center:** powerful tools for data mining and hypothesis generation of FAIR ‘omics data



Ask a question

Do background research

Construct a hypothesis

Plan experiments

Collect and analyze data

Publish results

I'm planning my experiments, and would like to find and evaluate key resources.

I'm publishing a paper, and would like to find RRIDs for citing key resources.

Resource Reports

Find and evaluate key research resources:

Antibodies, organisms, cell lines, tools and services, plasmids, biosamples

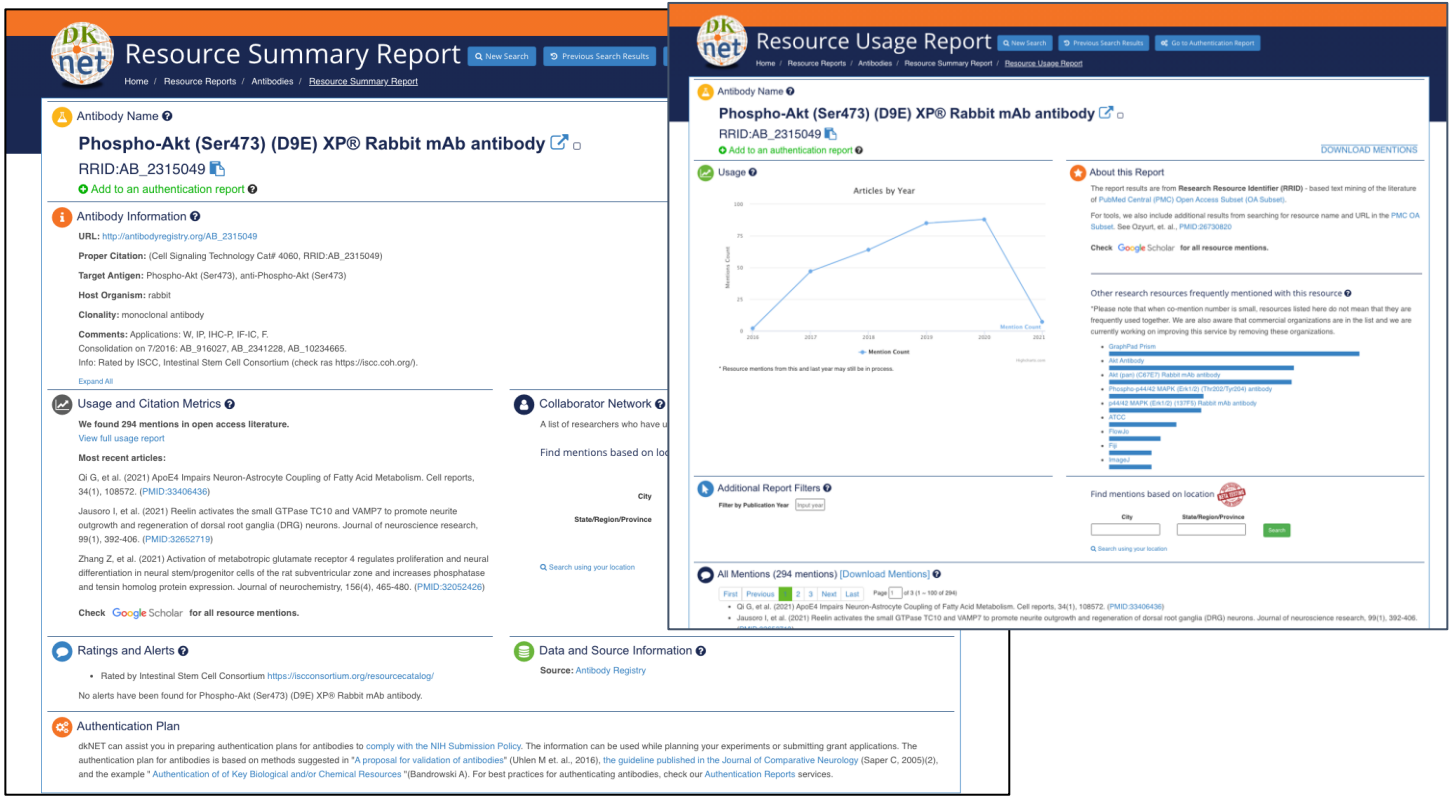
dkNET Resource Catalog

Resource Type	Number of Resources
Digital tools and services	21,862
Antibodies	2,506,357
Plasmids	677,675
Protocols	8,330
Cell lines	206,881
Organisms	663,385
Biosamples	3,082

Resource Reports

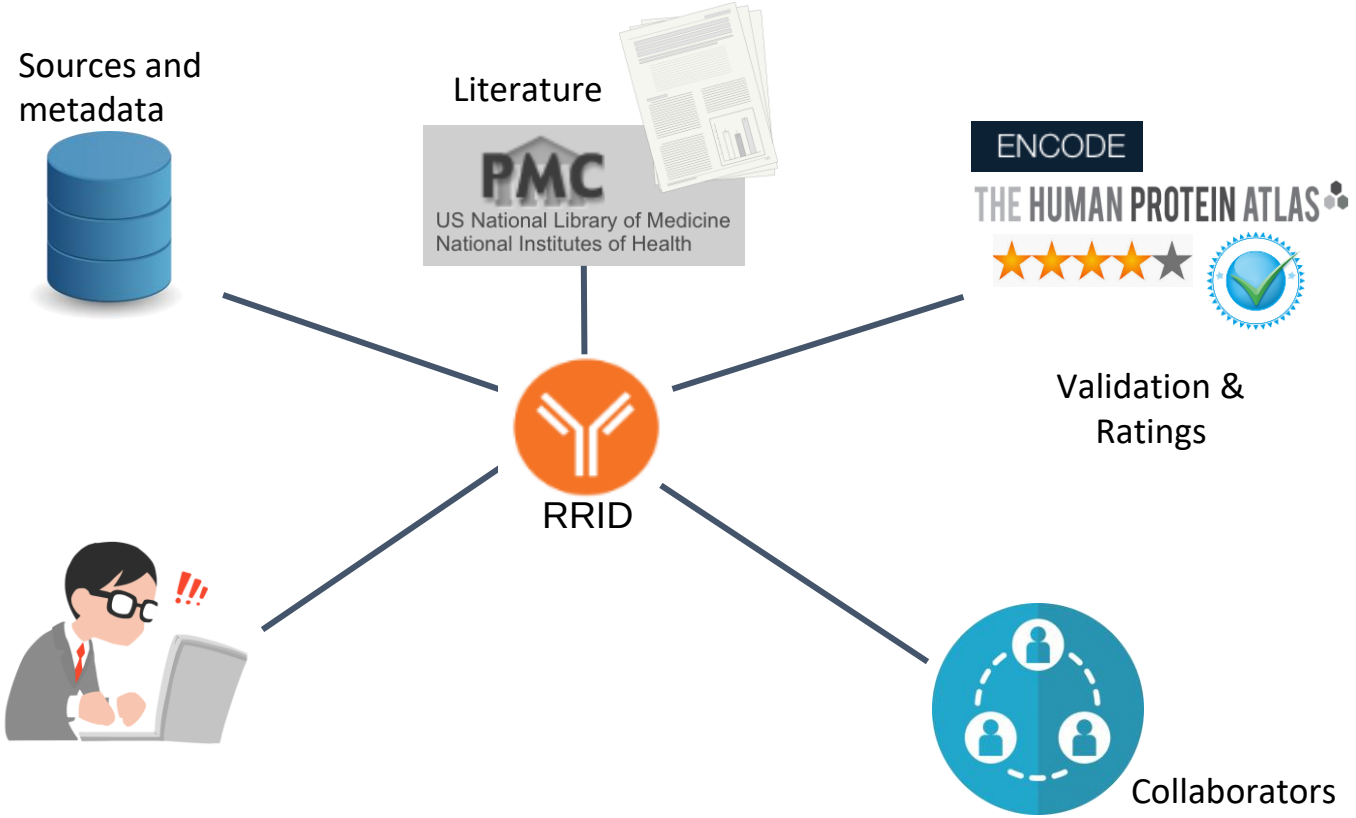
Report includes:

- Citations of usage and mentions
- Who is using them?
- Do they have issues?
- How do they compare?
- Is anyone near me familiar with them?



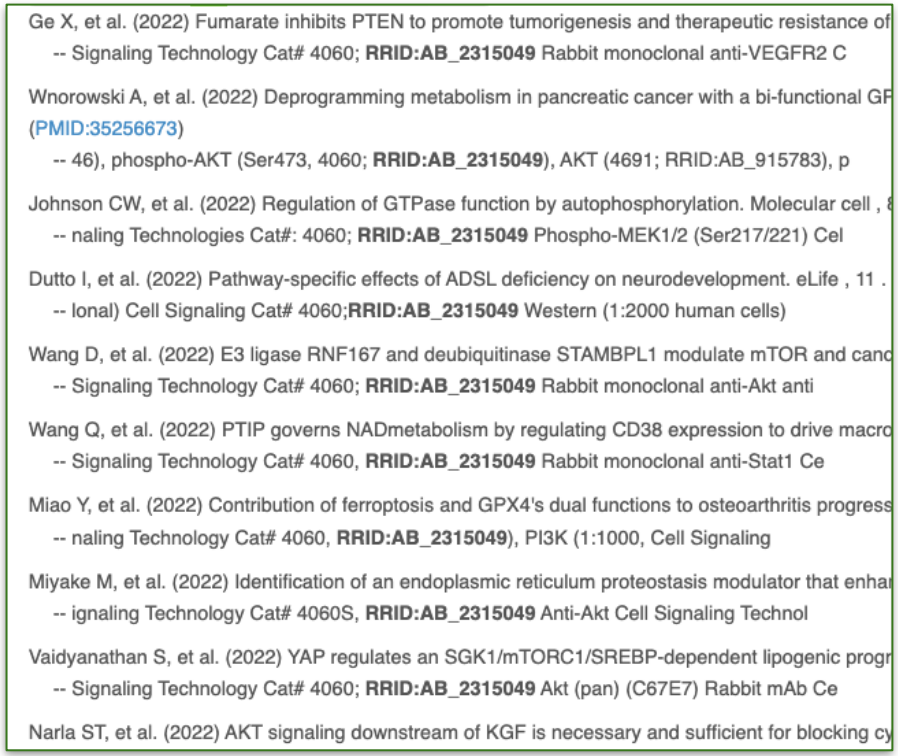
The Resource Information Network

Assembled a unique data set that aggregates information about key research resources for biomedical research using Research Resource Identifiers (**RRIDs)**



WHAT ARE RRIDS?

- A persistent identifier for research resources
- dkNET was instrumental in the development and adoption of RRIDs
- Supplied by authors to identify resources in the materials and methods section
- Designed to answer two simple questions:
  - What resources were used in a study
  - Who else has published with this resource?



Ge X, et al. (2022) Fumarate inhibits PTEN to promote tumorigenesis and therapeutic resistance of
-- Signaling Technology Cat# 4060; **RRID:AB_2315049** Rabbit monoclonal anti-VEGFR2 C

Wnorowski A, et al. (2022) Deprogramming metabolism in pancreatic cancer with a bi-functional GF
(PMID:35256673)
-- 46), phospho-AKT (Ser473, 4060; **RRID:AB_2315049**), AKT (4691; RRID:AB_915783), p

Johnson CW, et al. (2022) Regulation of GTPase function by autophosphorylation. Molecular cell ,
-- naling Technologies Cat#: 4060; **RRID:AB_2315049** Phospho-MEK1/2 (Ser217/221) Cel

Dutto I, et al. (2022) Pathway-specific effects of ADSL deficiency on neurodevelopment. eLife , 11 .
-- lonal) Cell Signaling Cat# 4060;**RRID:AB_2315049** Western (1:2000 human cells)

Wang D, et al. (2022) E3 ligase RNF167 and deubiquitinase STAMBPL1 modulate mTOR and canc
-- Signaling Technology Cat# 4060; **RRID:AB_2315049** Rabbit monoclonal anti-Akt anti

Wang Q, et al. (2022) PTIP governs NADmetabolism by regulating CD38 expression to drive macro
-- Signaling Technology Cat# 4060, **RRID:AB_2315049** Rabbit monoclonal anti-Stat1 Ce

Miao Y, et al. (2022) Contribution of ferroptosis and GPX4's dual functions to osteoarthritis progress
-- naling Technology Cat# 4060, **RRID:AB_2315049**), PI3K (1:1000, Cell Signaling

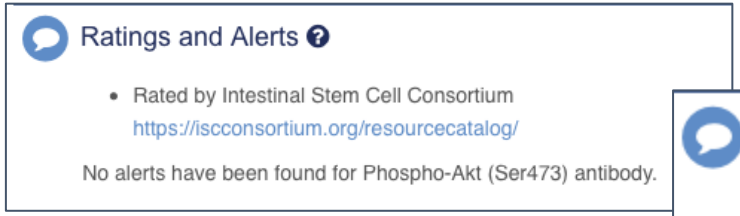
Miyake M, et al. (2022) Identification of an endoplasmic reticulum proteostasis modulator that enha
-- ignaling Technology Cat# 4060S, **RRID:AB_2315049** Anti-Akt Cell Signaling Technol

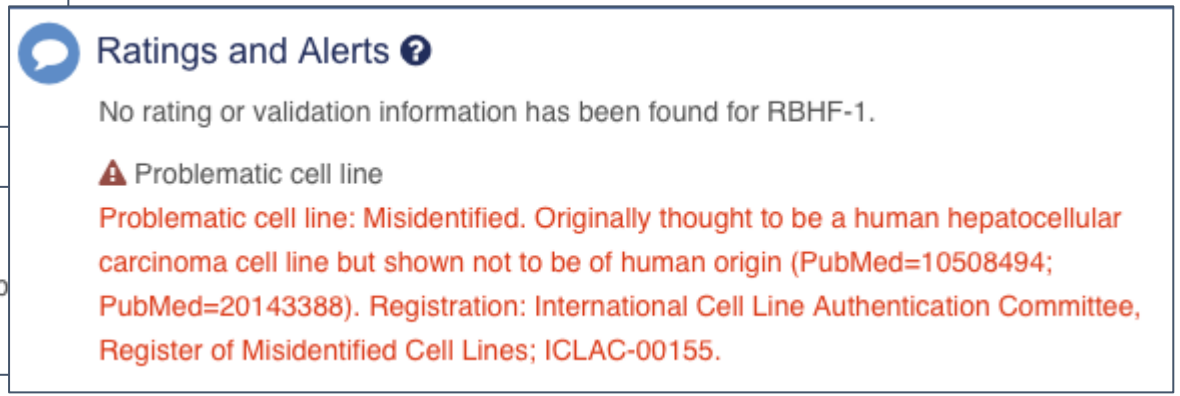
Vaidyanathan S, et al. (2022) YAP regulates an SGK1/mTORC1/SREBP-dependent lipogenic progr
-- Signaling Technology Cat# 4060; **RRID:AB_2315049** Akt (pan) (C67E7) Rabbit mAb Ce

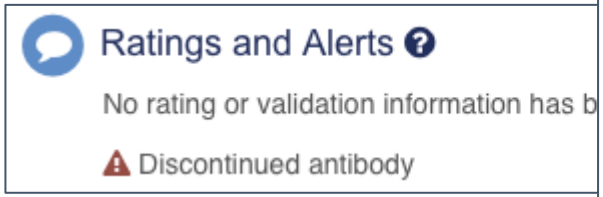
Narla ST, et al. (2022) AKT signaling downstream of KGF is necessary and sufficient for blocking cy

Resources Rating and Alerts

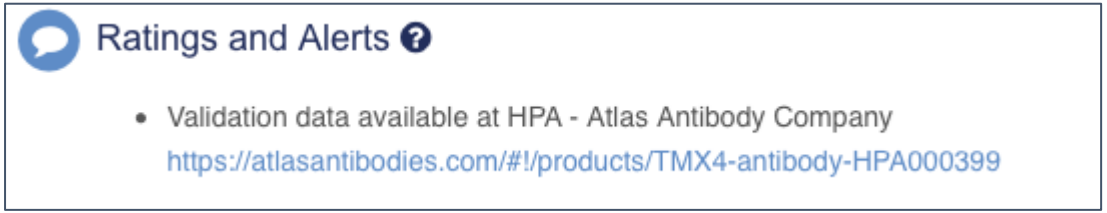
dkNET aggregates information from multiple sources about known issues with these resources





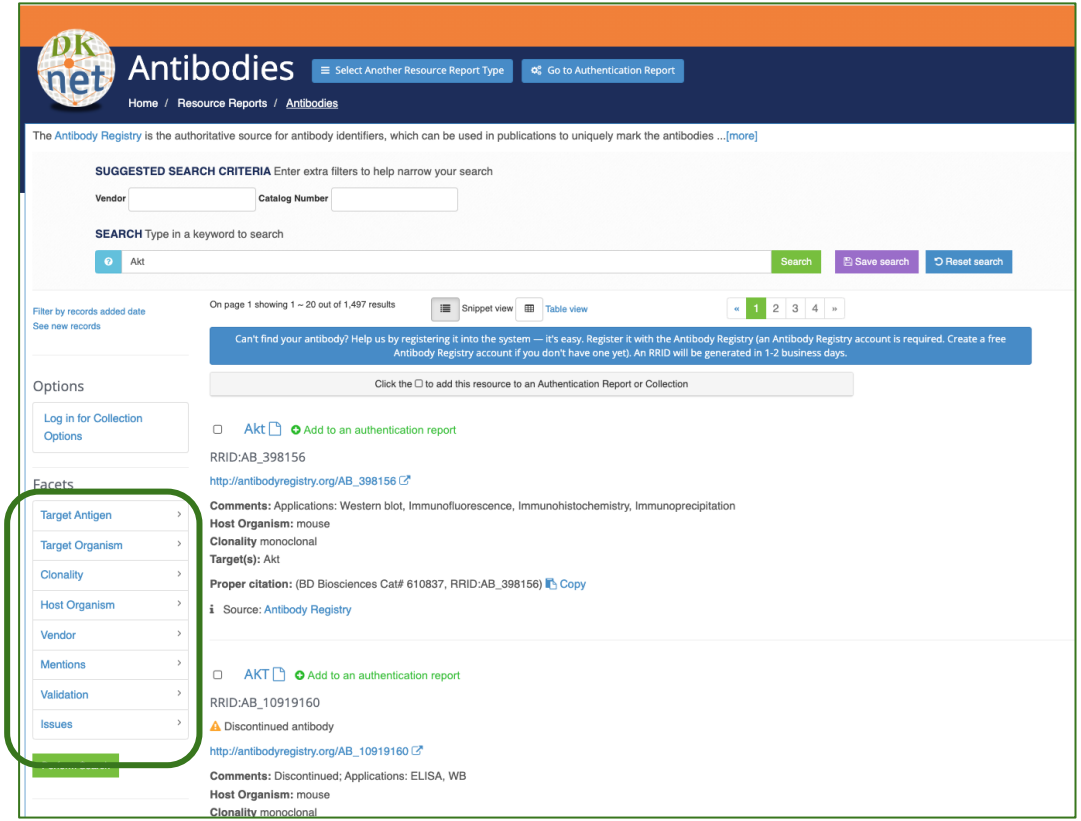


RRIDs provide us with an opportunity to alert researchers to issues with a particular resource at time of publication



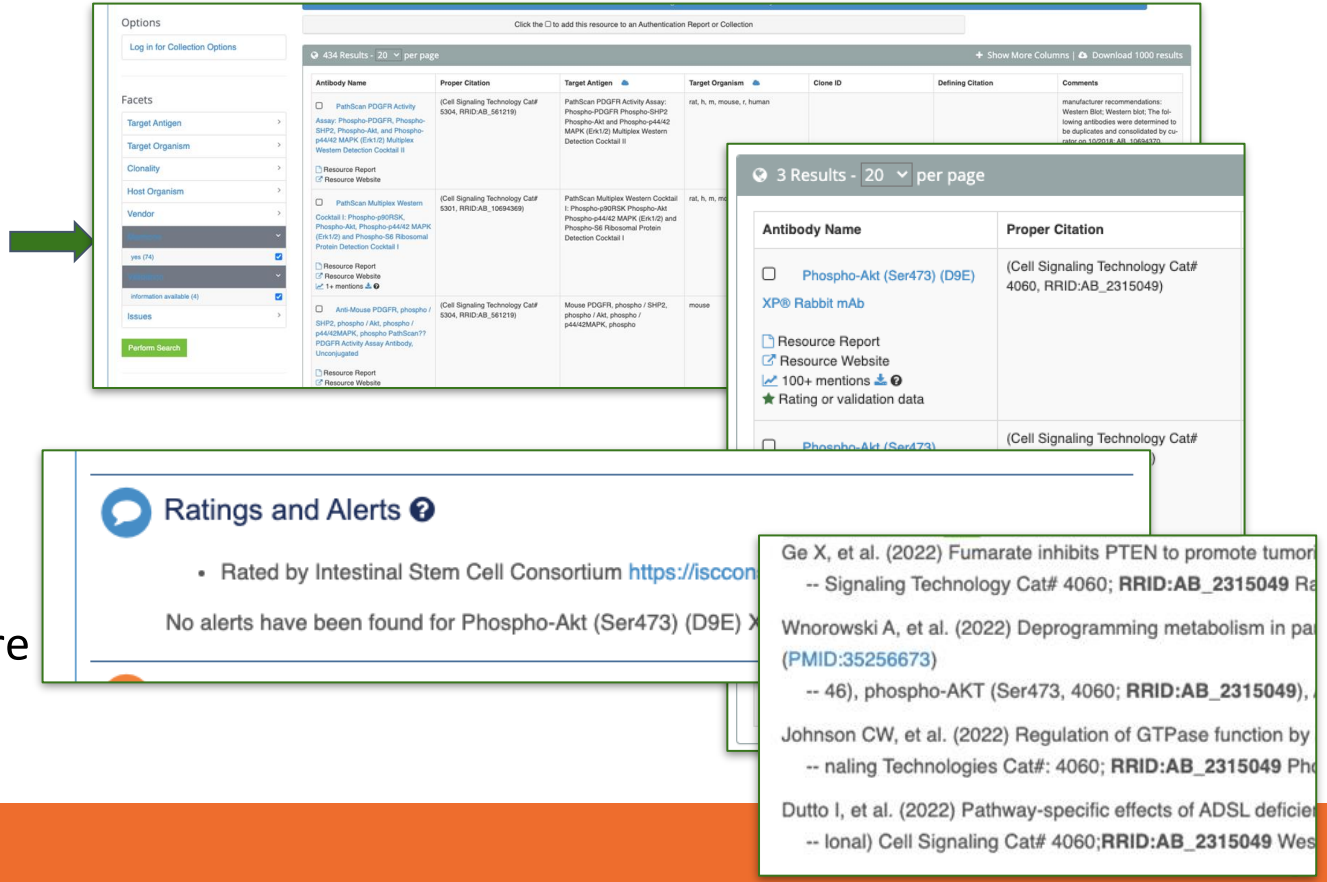
Searching the catalog

- Free text search
- Faceted browse and refinement
- Snippet and table view
- Download or save results
- Save searches
- Create result collections

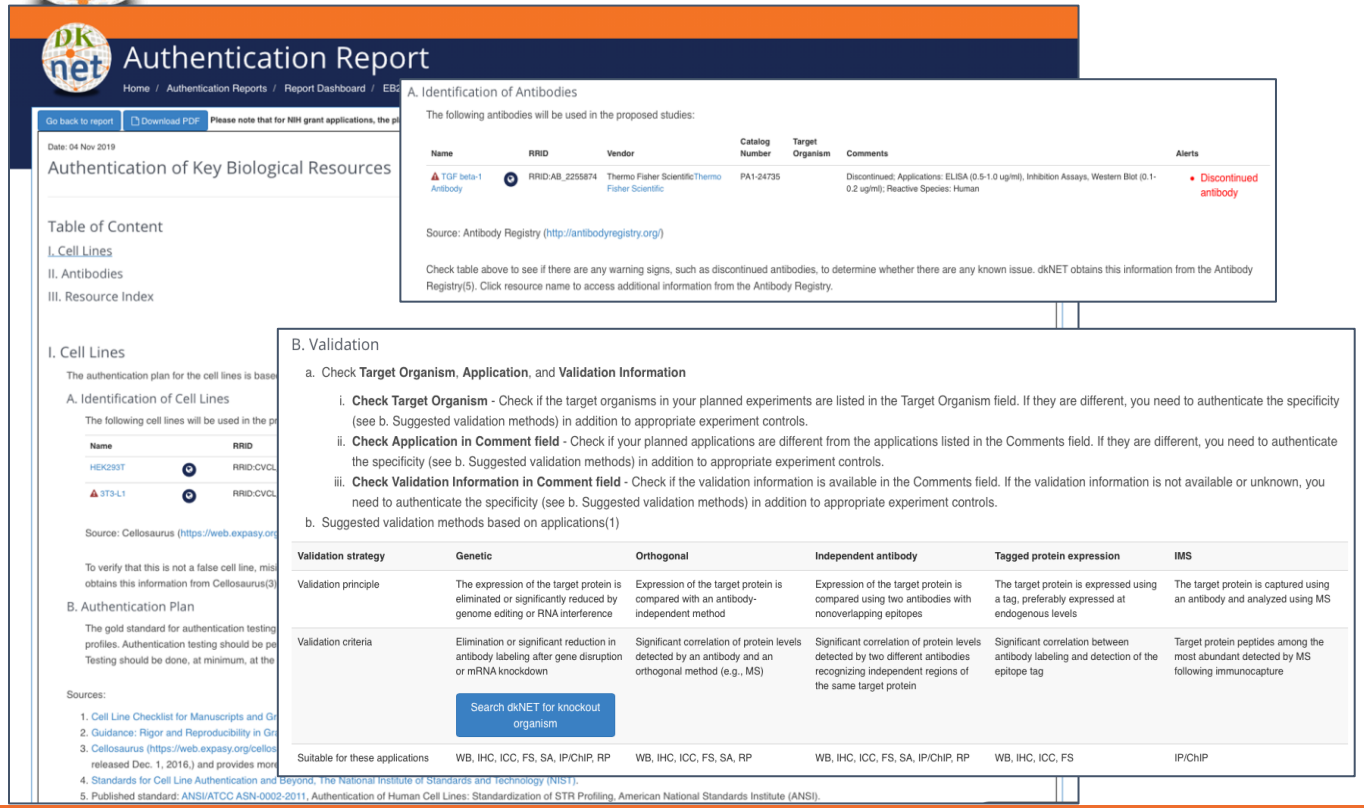


Find validated phospho AKT antibodies in use

- We track resource usage in the open access literature allowing you to find antibodies with the most literature mentions
- We aggregate validation/issue information from Centers, the literature and other trusted sources



Information for Authentication Reports: Cell lines and Antibodies



- NIH requires that you create an authentication plan for key research resources in your grant application
- Tool for evaluating how your resources perform and best practices for designing an authentication plan

I'm writing a proposal, and would like to know how to prepare data management plan.

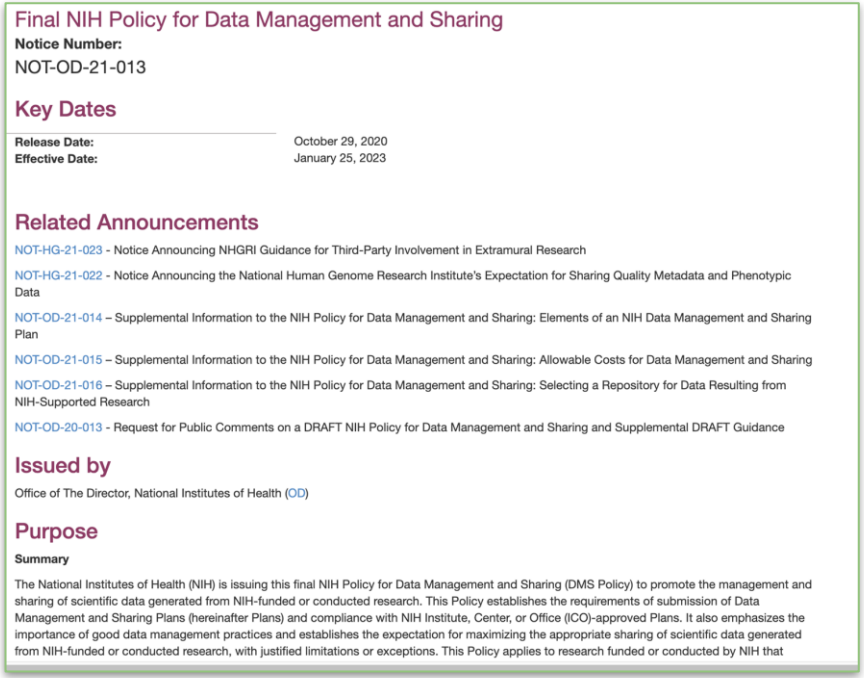
I'm publishing a paper, and would like to find a data repository to share my data.

FAIR data resources for biomedicine

FDI Lab: Co-authors of the FAIR data principles

FAIR Data and You: Are you ready for 2023?

- Effective Date: **January 25, 2023**
- US National Institutes of Health new data sharing policy goes into effect
- **All data** must be managed; most data should be shared
- "As open as possible; as closed as necessary"
- Mandates the ***inclusion, approval and execution*** of a Data Management and Sharing Plan
  - (DMP + S = DMS)



Final NIH Policy for Data Management and Sharing

Notice Number:
NOT-OD-21-013

Key Dates

Release Date:	October 29, 2020
Effective Date:	January 25, 2023

Related Announcements

NOT-HG-21-023 - Notice Announcing NHGRI Guidance for Third-Party Involvement in Extramural Research

NOT-HG-21-022 - Notice Announcing the National Human Genome Research Institute's Expectation for Sharing Quality Metadata and Phenotypic Data

NOT-OD-21-014 – Supplemental Information to the NIH Policy for Data Management and Sharing: Elements of an NIH Data Management and Sharing Plan

NOT-OD-21-015 – Supplemental Information to the NIH Policy for Data Management and Sharing: Allowable Costs for Data Management and Sharing

NOT-OD-21-016 – Supplemental Information to the NIH Policy for Data Management and Sharing: Selecting a Repository for Data Resulting from NIH-Supported Research

NOT-OD-20-013 - Request for Public Comments on a DRAFT NIH Policy for Data Management and Sharing and Supplemental DRAFT Guidance

Issued by

Office of The Director, National Institutes of Health (OD)

Purpose

Summary

The National Institutes of Health (NIH) is issuing this final NIH Policy for Data Management and Sharing (DMS Policy) to promote the management and sharing of scientific data generated from NIH-funded or conducted research. This Policy establishes the requirements of submission of Data Management and Sharing Plans (hereinafter Plans) and compliance with NIH Institute, Center, or Office (ICO)-approved Plans. It also emphasizes the importance of good data management practices and establishes the expectation for maximizing the appropriate sharing of scientific data generated from NIH-funded or conducted research, with justified limitations or exceptions. This Policy applies to research funded or conducted by NIH that

https://grants.nih.gov/grants/guide/notice-files/NOT-OD-21-013.html

More Details...

What

- Defines Scientific Data as: “The recorded factual material commonly accepted in the scientific community as of sufficient quality to validate and replicate research findings, regardless of whether the data are used to support scholarly publications. Scientific data **do not include** laboratory notebooks, preliminary analyses, completed case report forms, drafts of scientific papers, plans for future research, peer reviews, communications with colleagues, or physical objects, such as laboratory specimens.”
- Even those scientific data not used to support a publication are considered scientific data and within the final DMS Policy’s scope

When

- “[s]hared scientific data should be made accessible as soon as possible, and no later than the time of an associated publication, or the end of the award/support period, whichever comes first.”
- Researchers may share data underlying publication during the period of award but may share other data that have not yet led to a publication by the end of the award period.

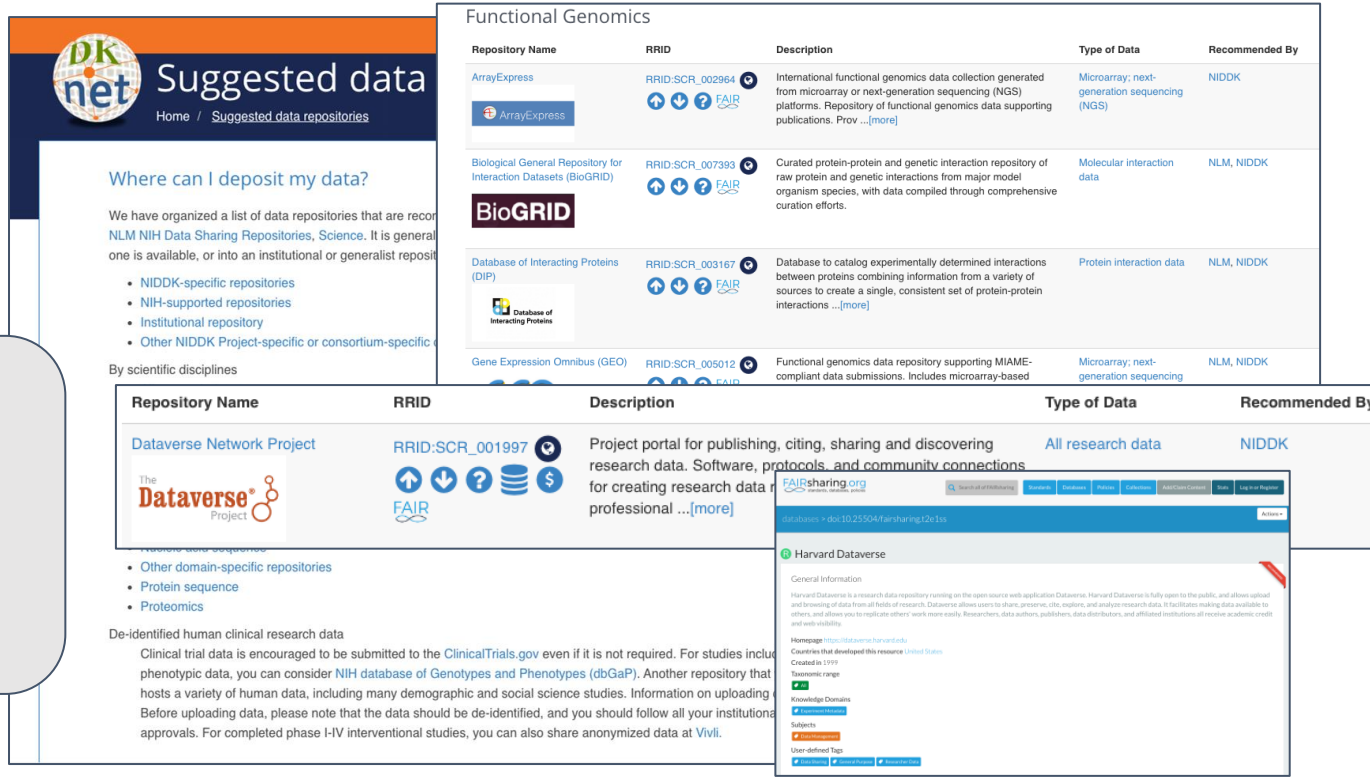
Where

- Encourages the use of established repositories to the extent possible.

Where Can I Deposit My Data?

- List of DK relevant repositories, recommended by NLM and various journals
- Created in conjunction with NIDDK

- FAIR Standards
- Clinical Repositories Information
- Data maintenance
- Data size limit and cost
- Dynamic database



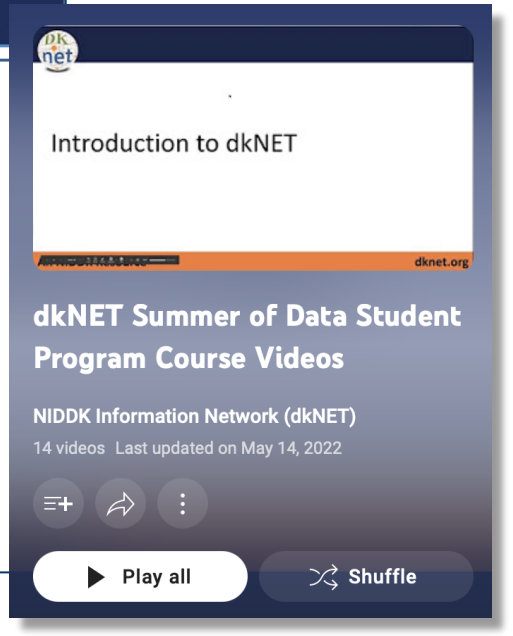
Having trouble? Ask dkNET

FAIR Data Resources

dkNET now offers information on how to manage data in compliance with the FAIR Data Principles.

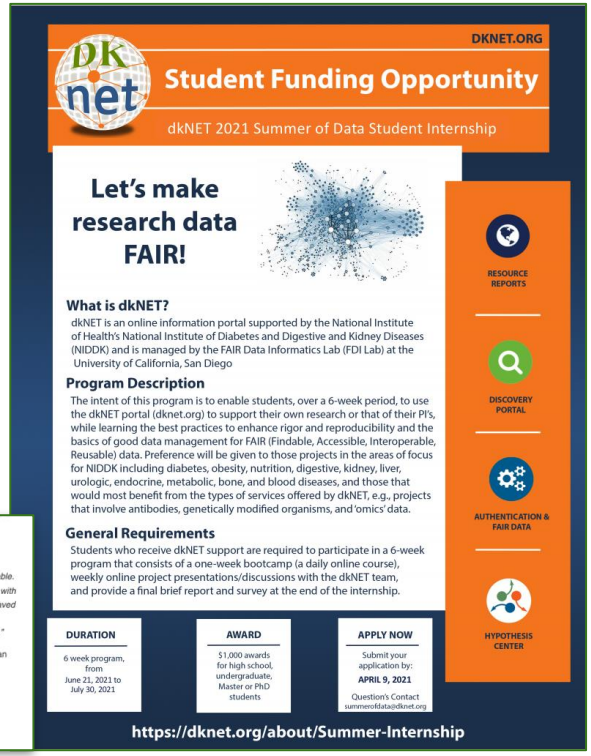
- Find information for best practices in managing research data
- List of community approved repositories
- Request a data repository recommendation
- Tool for creating a FAIR Data Plan (Coming soon)

YouTube

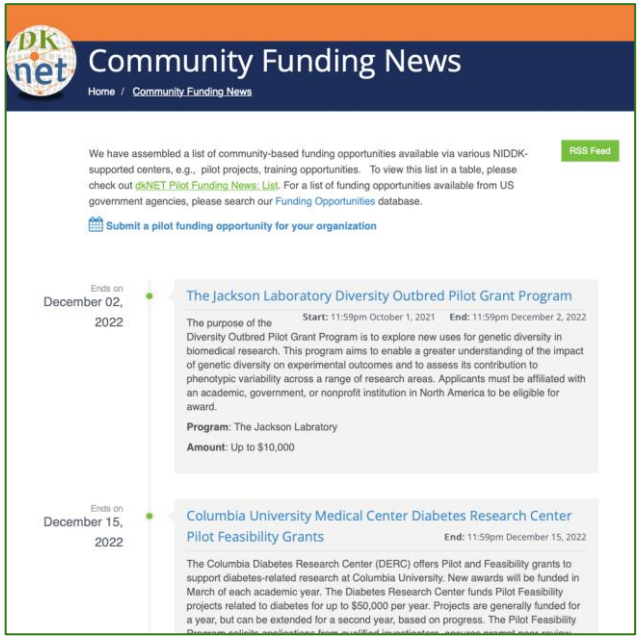


Other dkNET resources (About menu)

- Pilot funding database
- Summer program
- Bioinformatics program



https://dknet.org/about/Summer-Internship



https://dknet.org/about/funding

Introducing: dkNET special collections

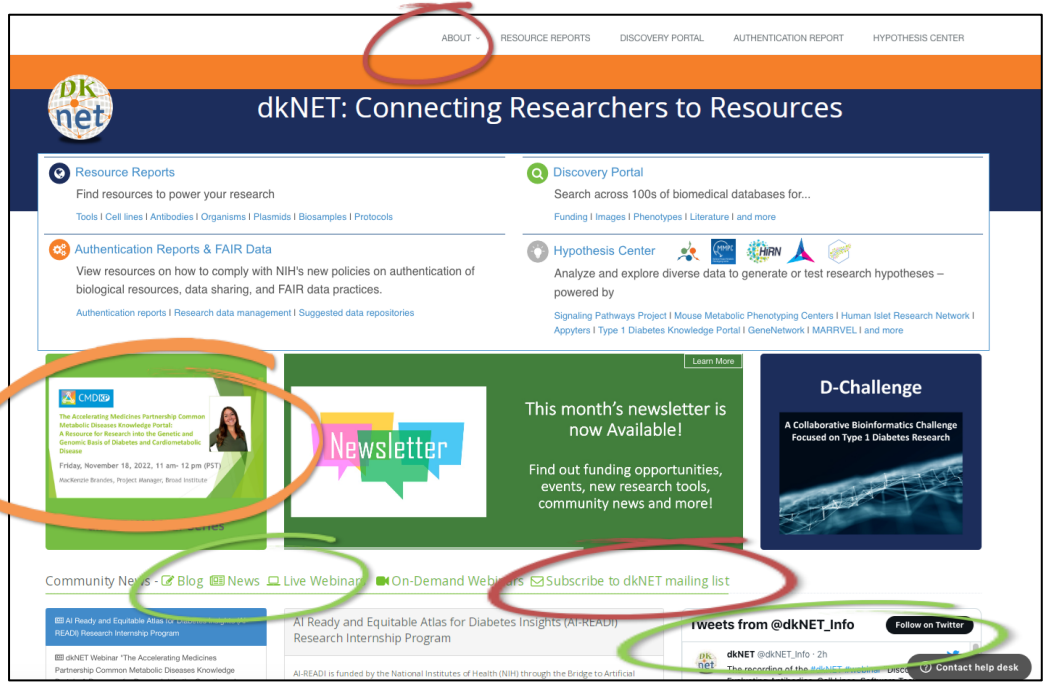
- Curated collection and examples of dkNET resources for specific domain/topic
- Links to tutorials

https://dknet.org/about/resource-collections

Get involved in the dkNET Community

dkNET Homepage: dkNET.org

Blog, Calendar



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