RRIDs are Research Object Identifiers; a practical use case, *mainly for biology

Anita Bandrowski,
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orcid.org/0000-0002-5497-0243
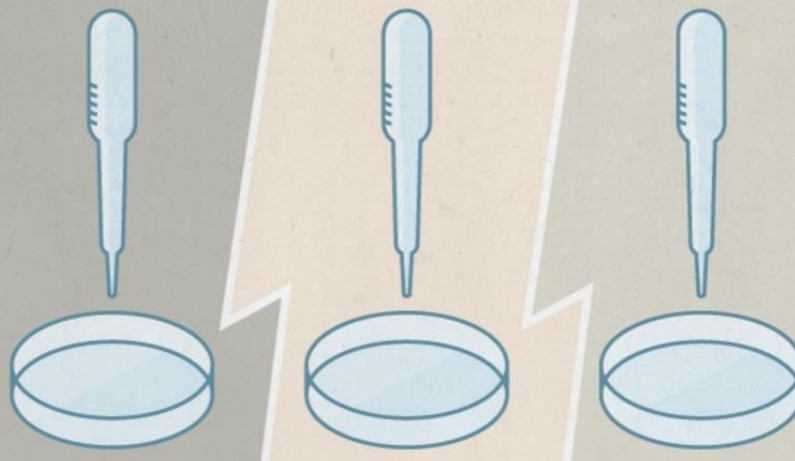
Quality of published research is in question

Solving quality: mandates and solutions

NIH NOT-OD-16-011
Journals RRIDs
Societies FASEB Guidelines
Non-Profits TOP Guidelines

Reproducibility of science is critical
Transparency is achievable

What is reproducible science?

What is reproducible science?

Step 1: Materials

Step 2: Methods

You'll need:

- 1 bunch of parsley
- 1 bulb of garlic
- 2/3 cup neutral oil (such as canola oil, light olive oil, or grapeseed oil)
- 1 1/2 teaspoons crushed red pepper flakes
- 1 teaspoon salt
- 1/8 teaspoon freshly ground black pepper
- juice of half a lime
- Skirt steak (Make however much you want! You'll have plenty of chimichurri to go with it.)

N2, a peptide corresponding to a conserved C-terminal section of mouse and human NMHC-IIA, binds CM22 in vitro.[7] N2 blocks IgM antibody deposition and inhibits injury in rodent models of intestinal, skeletal muscle, and myocardial I/R injury as well as burn injury and hemorrhagic shock.[8, 9, 10, 11, 12 and 13] Thus, NMHC-IIA appears to be a conserved injury/ischemia antigen in multiple rodent tissues. A critical, unanswered question is whether human antibodies that target NMHC-IIA exist and if so, whether NMHC-IIA is a conserved injury antigen in humans.

To address these questions, we engrafted NOD.SCID.IL2rg knockout mice, which lack endogenous murine NK cells and T and B cells, with human peripheral blood lymphocytes to generate humanized mice.[14 and 15] Prior studies [...] mice stably engraft with human T cells and generate at least so[...] isotypes.[16 and 17] In this model, we characterize B cell and antib[...] the phenotype of intestinal I/R injury. We then test the efficacy o[...] using this novel humanized mouse model.

Methods

Generation of humanized PBL-SCID mice

NOD.PkSCID.IL2 receptor gamma chain null mice were purcha[...] Laboratories (Bar Harbor, ME). Human lymphocytes were [...] density centrifugation from peripheral blood obtained from [...] Three- to 4-week-old male mice were injected with 20–25 millio[...]

Step 1: In Practice
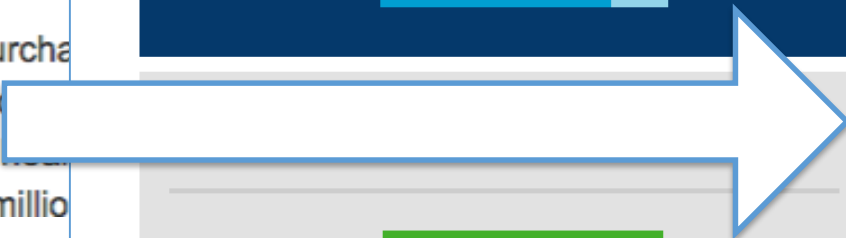
JAX® MICE SEARCH

The Jackson Laboratory

Search by Stock #   Keyword Search

Enter Search Term
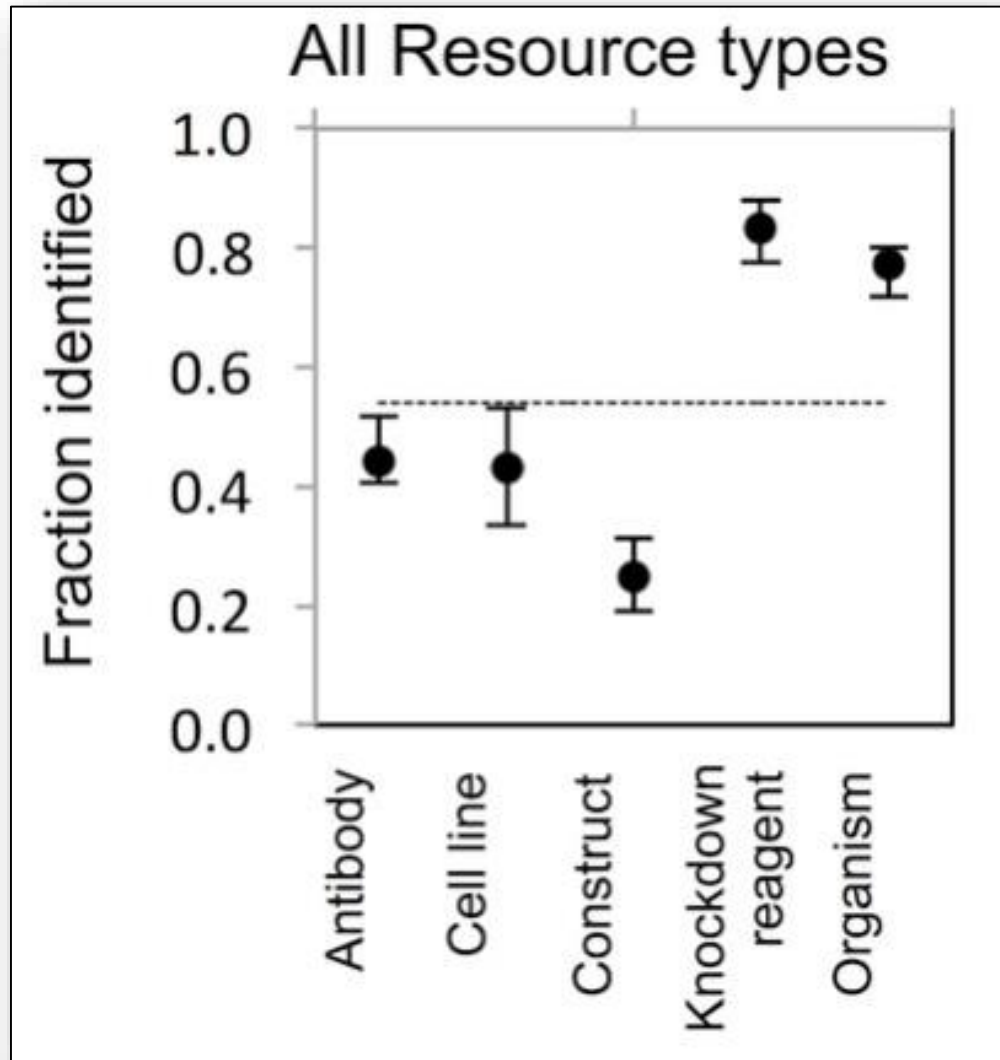
RESULTS FOR: NOD.PkSCID.IL2 ✕

Sorry, your search yielded no results

CLEAR ALL

1. **Text Search**
   A text search looks for the entire text st[...]
   (albumin cre),
   search for the first (albumin), then sear[...]
   set.

How common is this?

Papers are currently poor at identifying the simplest part of the paper, the materials used

Vasilevsky 2013

But the author knows what was used!
This author got back to me within 2 hours with the stock number of this mouse

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N2, a peptide corresponding to a conserved C-terminal section of mouse and human NMHC-IIA, binds CM22 in vitro.[7] N2 blocks IgM antibody deposition and inhibits injury in rodent models of intestinal, skeletal muscle, and myocardial I/R injury as well as burn injury and hemorrhagic shock.[8, 9, 10, 11, 12 and 13] Thus, NMHC-IIA appears to be a conserved injury/ischemia antigen in multiple rodent tissues. A critical, unanswered question is whether human antibodies that target NMHC-IIA exist and if so, whether NMHC-IIA is a conserved injury antigen in humans.

To address these questions, we engrafted NOD.SCID.IL2rg knockout mice, which lack endogenous murine NK cells and T and B cells, with human peripheral blood lymphocytes to generate humanized mice.[14 and 15] Prior studies have shown that these mice stably engraft with human T cells and generate at least some human antibody isotypes.[16 and 17] In this model, we characterize B cell and antibody expression as well as the phenotype of intestinal I/R injury. We then test the efficacy of N2 against intestinal I/R using this novel humanized mouse model.

Methods

Generation of humanized PBL-SCID mice

NOD.PkSCID.IL2 receptor gamma chain null mice were purchased from Jackson Laboratories (Bar Harbor, ME). Human lymphocytes were obtained by Ficoll-Paque density centrifugation from peripheral blood obtained from healthy adult, male donors. Three- to 4-week-old male mice were injected with 20–25 million human lymphocytes

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Public

bandrow — 17 days ago

> NOD.PkSCID.IL2 receptor gamma chain null mice

I can't find this mouse at JAX: https://www.jax.org/search?q=NOD.PkSCID.IL2 any help would be appreciated

1 reply | Edit | Delete | Reply | Share

bandrow — 17 days ago

dear anita,

here's a link to jackson labs page for the mice used --

https://www.jax.org/strain/005557

best, eric

Edit | Delete | Reply | Share

Perhaps this paper should have read...

Methods

Generation of humanized PBL-SCID mice

NOD.PkSCID.IL2 receptor gamma chain null mi... n Jackson
Lab **RRID:IMSR_JAX:005557** an lymphoc... Ficoll-Paque
density centrifugation from peripheral blood obta... , male donors.
Three- to 4-week-old male mice were injected with 20–25 million human lymphocytes

Resolvers: scicrunch, n2t or identifiers.org

The Jackson Laboratory

MOUSE STRAIN DATASHEET - 005557

Email   Download PDF   Print   JAX® Mice Search   Help

NOD.Cg-*Prkdc*^{scid} *Il2rg*^{tm1Wjl}/SzJ   POPULAR

Stock No: 005557 | NSG

Congenic,Spontaneous Mutation,Targeted Mutation

READILY AVAILABLE

PLACE ORDER

Readily available in any quantity needed.

OVERVIEW   DETAILS   GENETICS   DISEASE/PHENOTYPE   TECHNICAL SUPPORT   PRICING & AVAILABILITY   TERMS OF USE   RELATED STRAINS

Also Known As: NOD-*scid* IL2Rgamma^{null}, NOD-*scid*
IL2Rg^{null}, NSG, NOD *scid* gamma

These mice are most often referred to using their branded name
"NSG™" and are extremely immunodeficient. The mice carry two
mutations on the NOD/ShiLtJ genetic background; severe combined
immune deficiency (*scid*) and a complete null allele of the IL2 receptor
common gamma chain (*IL2rg*^{null}). The *scid* mutation is in the DNA repair
complex protein *Prkdc* and renders the mice B and T cell deficient. The
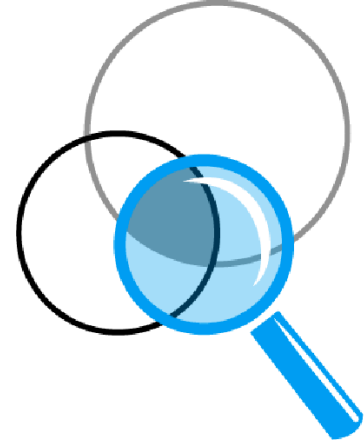*IL2rg*^{null} mutation prevents cytokine signaling through multiple

Anatomy of the RRID syntax

DSHB Cat# GAD-6, Lot #12, RRID:AB_528264

| Company or Provider | Local Identifier | Version or Lot used | Global Unique Persistent Identifier |

How can we get better data into papers?

2009: LAMHDI meeting – project hatched

2011: Meeting with Society for Neuroscience, Journal of Neuroscience full editorial board presenting the
problem and results of text mining study

2012: Society for Neuroscience – defined the problem for Editors of top Neuroscience journals; sponsored
by INCF

2013: NIH Meeting - brought the editors back to define the solution; 2 day workshop sponsored by NIDA
and INCF, several IC directors in attendance

2013: Society for Neuroscience – mainly publishers, defined the timeline of starting the project

2014: Neuroscience Information Framework – built scicrunch.org/resources based on NIF technologies and
members of the OHSU team populated web pages / instructions etc.

2014: Project starts with Journal of Neuroscience, Neuroinformatics, F1000, Brain and Behavior and
Journal of Comparative Neurology taking a strong lead

2015: Paper describing how RRIDs are used by authors of the first 100 papers is co-published in 4 journals

2016: integration with Hypothes.is tool gives curators an easy way to verify RRIDs, sci-score gives
authors an easier way to detect what is a resource

2018: SciScore, an automated tool for publishers

Journals key solution

Journals will not change

Journals in aggregate

Funders role

ID based tracking

Project Management Key

Technology innovation

RRID Author's Workflow

http://scicrunch.org/resources

SEARCH FOR RESOURCES

GFAP

Anti-Tyrosine Hydroxylase antibody, Millipore

Cite this **Millipore Cat# AB1542 RRID:AB_90755**
Vendor Catalog #: AB1542
AB Registry ID: AB_90755
References: PMID:16736471, PMID:16802333, PMID:18175352, PMID:18425804, PMID:18634004, PMID:20148440, PMID:22821606, PMID:23322532, PMID:23623814, PMID:23696474, PMID:24715A, PMID:25728799, PMID:25855184, PMID:26599696, PMID:27997986
Host Organism:
Clonality: polyclonal antibody
Target(s): Tyrosine Hydroxylase
Comments: manufacturer recommendations: Western Blot; Immunohistochemistry: IH, WB
[less]

Millipore Cat# AB1542 Lot# RRID:AB_90755

From Current Category

⊞ AntibodyRegistry: Antibodies (3) | 💬 Cite This | ℹ View Source Information

RRID portal includes:
Antibodies 2.4M
Organisms 600K (25 stock center/MODs)
Cell lines 100K
Software projects 15K

Journal directs author to RRID portal

Author searches for an antibody

Author copies "Cite This" text into manuscript

Paper is published

Paper becomes data

Google RRID:AB_90755

Scholar — 12 results (0.06 sec)

Articles

Case law

My library

α-Synuclein-independent h...   moto...
endolysosomal Parkinsonis...
LR Kett, B Stiller, MM Bernath, I Tasset... - Journal of ..., 2015 - Soc N...
Cited by 16   Related articles   All 8 versions   Cite   Save

[HTML] The Resource Identification Initiative: A cultural ...
A Bandrowski, M Brush, JS Grethe... - Journal of ..., 2016 - Wiley On...
... AB1542, **RRID:AB_90755**). image ... Google Scholar result for the ...
RRID (9/2014; http://scholar.google.com/scholar?q=**RRID:AB_90755**)...
reported RRIDs in the first 100 articles, by number of articles using the...
Cited by 27   Related articles   All 32 versions   Cite   Saved

The orexinergic neurons receive synaptic input from ...
G Bochorishvili, T Nguyen, MB Coates... - Journal of ..., 2014 - Wiley...
... TH mouse anti-sheep antibody (AB1542; Millipore; **RRID:AB_9075...**
TH from rat pheochromocytoma. As reported by Millipore, this antibod...
of approximately 60 kDa by western blot of mouse brain lysate. ...
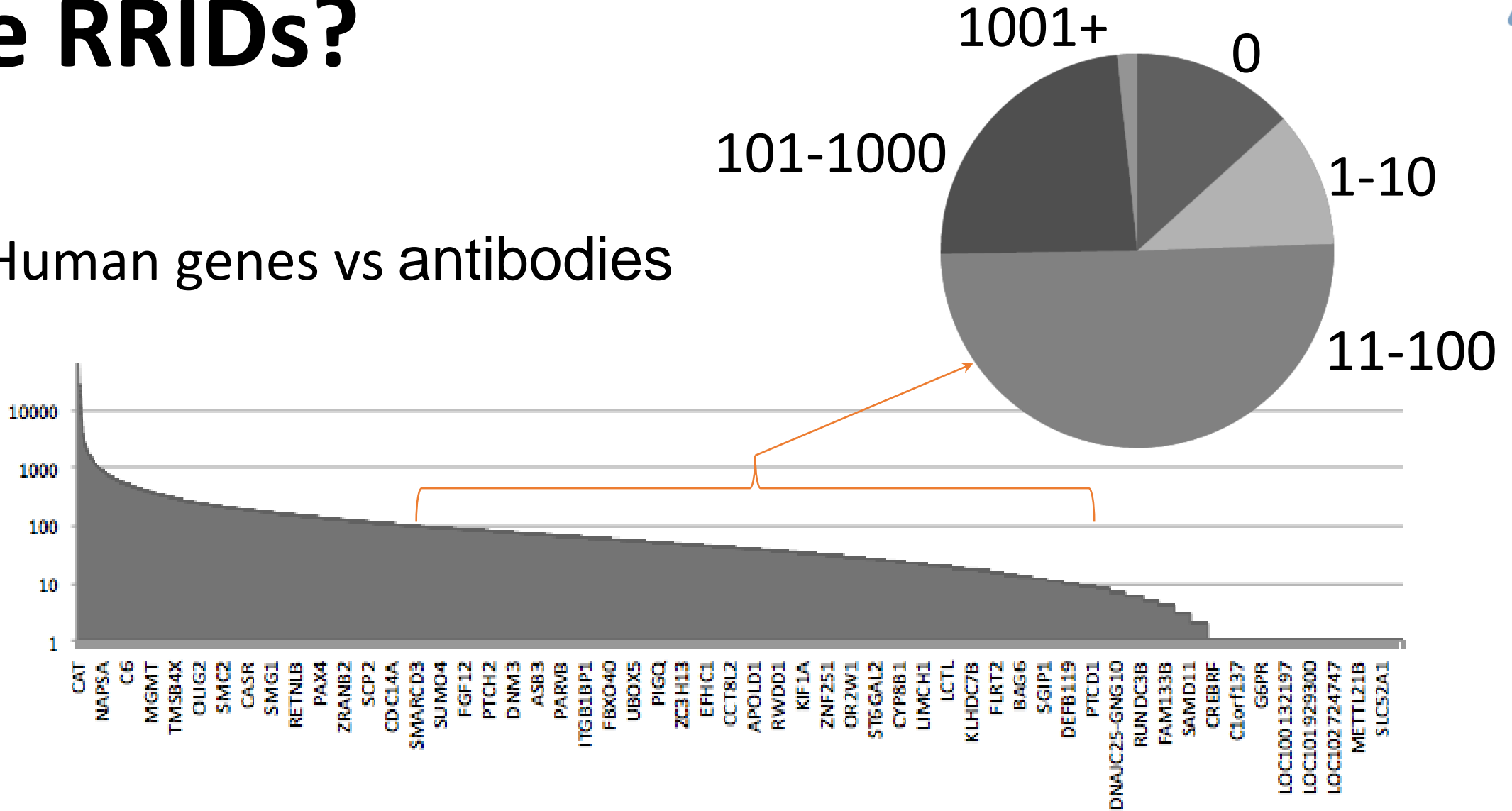Cited by 16   Related articles   All 7 versions   Cite   Saved

Any time
Since 2017
Since 2016
Since 2013
Custom range...

Sort by relevance
Sort by date

How Comprehensive are RRIDs?

Human genes vs antibodies

Trish Whetzel and Anita Bandrowski

Antibodyregistry.org

eLIFE

PMCID: PMC49354

ELKS controls the pool of readily releasable vesicles at excitatory synapses through its N-terminal coiled-coil domains

The Jackson Laboratory

MOUSE STRAIN DATASHEET - 015830

STOCK *Erc1* [tm2.1Sud] /J

Stock No: 015830

Targeted Mutation

OVERVIEW   DETAILS ˅   GENETICS   DISEASE/PHENOTYPE ˅   TECHNICAL SUPPORT ˅

ELKS2, which are both present at inhibitory active zones.

In the long-term, it will be important to understand how the synapse-specific control of RRP and P contribute to circuit function. Human genetic experiment mutations in *ERC1*/ELKS1 may contribute to autism spectrum disorders (Silva et al 2014), and it is possible that the pathophysiology arises from synapse-specific misregulation of neurotransmitter release.

Materials and methods

Mouse lines

All experiments using mice were performed according to institutional guidelines at Harvard University. Conditional double knockout (cDKO) mice that remove the ELKS1α/2α proteins were generated by crossing conditional knockout mice for the ([Liu et al., 2014] RRID:IMSR_JAX:015830) and *Erc2* ([Kaeser et al., 2009] RRID:IMSR_JAX:015831) genes. ELKS1α/2α cDKO mice were maintained as do homozygote line.

Generation of antibodies

ELKS2α specific antibodies were raised in rabbits using an ELKS2 peptide (^{109}LSHTDVLSYTDQ^{120}). Peptides were synthesized and conjugated to keyhole hemocyanin (KLH) via an N-terminal cysteine residue. Rabbits were inoculated a Cocalico Biologicals with KLH-conjugated ELKS2 peptides and given booster inje every two weeks, and bleeds were collected every three weeks. Sera were screened protein samples harvested from cultured neurons, brain homogenate, and transfecte

SciBotCurationGroup

scibot   Jul 13
SciBotCurationGroup

IMSR_JAX:015830

Proper Citation: RRID:IMSR_JAX:015830

Name: STOCK Erc1 $^{tm2.1Sud}$/J

Affected Gene: Erc1

Availability: mouse cells

Catalog ID: JAX:015830

Database: IMSR

Genomic Alteration: tm2.1Sud

Name: STOCK Erc1 $^{tm2.1Sud}$/J

Notes: gene symbol note: ELKS/RAB6-interacting/CAST family member 1; mutant stock: targeted mutation 2.1, Thomas C Sudhof

Proper Citation: RRID:IMSR_JAX:015830

Reference:

Species: Mus musculus

resolver lookup

RRID:IMSR_JAX:015830

How to take the data out of papers? Hypothes.is

https://blog.box.com/blog/introducing-developer-tokens/

Data available!
Tool access available!

Mined data is used in several applications

Paper data in Hypothes.is

RRID data is used in SciCrunch.org/resolver

also in xml
SciCrunch.org/resolver/
AB_2535792.xml

Who does this?

About   Careers   Labs

July 2016

eLife joins the Resource Identification Initiative

Thursday, July 7, 2016 - 09:0

To promote reproducibility

Research Resource Identifi

description of the research

Resources used in experime
barrier to replicating the resu
Initiative (#RII), a community-
aims to improve reproducibili
and unique Research Resou
resources.

RRIDs must be machine-rea

ENDOCRINE SOCIETY

Aug 2016

Journals   Books   Meeting Abstracts   Endocrine News   Advertise

Home > Instructions to Authors > Endocrinology Instructions to Authors

Antibody Table

It is the policy of *Endocrinology* to require authors using antibodies for immunohistochem
immunocytochemistry, western blots, immunoblots, immunoneutralization, or related
methodology, to submit an Antibody table. This table should be numbered to indicate its
position in the sequence of tables in the article (e.g. Table 1). In the Methods section

CellPress

Explore

Sept/Oct 2016

Cell Press STAR Methods

Cell Press is pleased to introduce a new format for reporting methods that replaces t
Methods format (Structured, Transparent, Accessible Reporting) will be introduced th
journals. The format reflects the changing needs of the scientific community for incre
improved rigor and reproducibility in research.

Text Format

The Methods and Resour
There is no length limit. Alt
Methods and Resources te

- CONTACT FOR REAG
- EXPERIMENTAL MOD
- METHOD DETAILS
- QUANTIFICATION AN
- DATA AND SOFTWAR
  - Software
  - Data Resources
- ADDITIONAL RESOUR

Table Format

JNeurosci
THE JOURNAL OF NEUROSCIENC

Jan 2016

RRIDS

JNeurosci encourages use of Research Resource Identifiers (RRIDs) through the
used in the course of scientific research. The project helps address concerns of re
RRIDs can be used to link readers to external resources and enable search engin

To find an RRID: visit https://scicrunch.org/resources and enter your search term(s

- Antibodies: searching for the catalog number usually narrows the search to on
- Cell Lines: searching for the catalog number of an established cell line is usual
  of results.
- Organisms: you can include PubMed IDs (PMIDs) in your search or filter your s
- Software tools: usually the name of the tool (MATLAB or ImageJ) or the institu

Search help is available at: rii-help@scicrunch.org.

Once you have located an RRID, insert "RRID:" plus the identifier in the appropria

- Antibodies: "Sections were stained with a rabbit polyclonal antibody against EF

nature

authors & referees

Oct 2018

authors & referees > Policies > Availability of data, materials,

Site content

Homepage

Policies

⊢ Publication ethics & scholarly communication

⊢ Bioethics & Biosecurity

⊢ Availability of data,

Availability of data, materials, code and protocols

An inherent principle of publication is that others should be able to rep
authors' published claims. A condition of publication in a Nature Resea
**are required to make materials, data, code, and associated pro
to readers without undue qualifications**. Any restrictions on the a
information must be disclosed to the editors at the time of submission
be disclosed in the submitted manuscript.

After publication, readers who encounter refusal by the authors to co
should contact the chief editor of the journal. In cases where editors a

METHODS AND RESOURCES

KEY RESOURCES TABLE

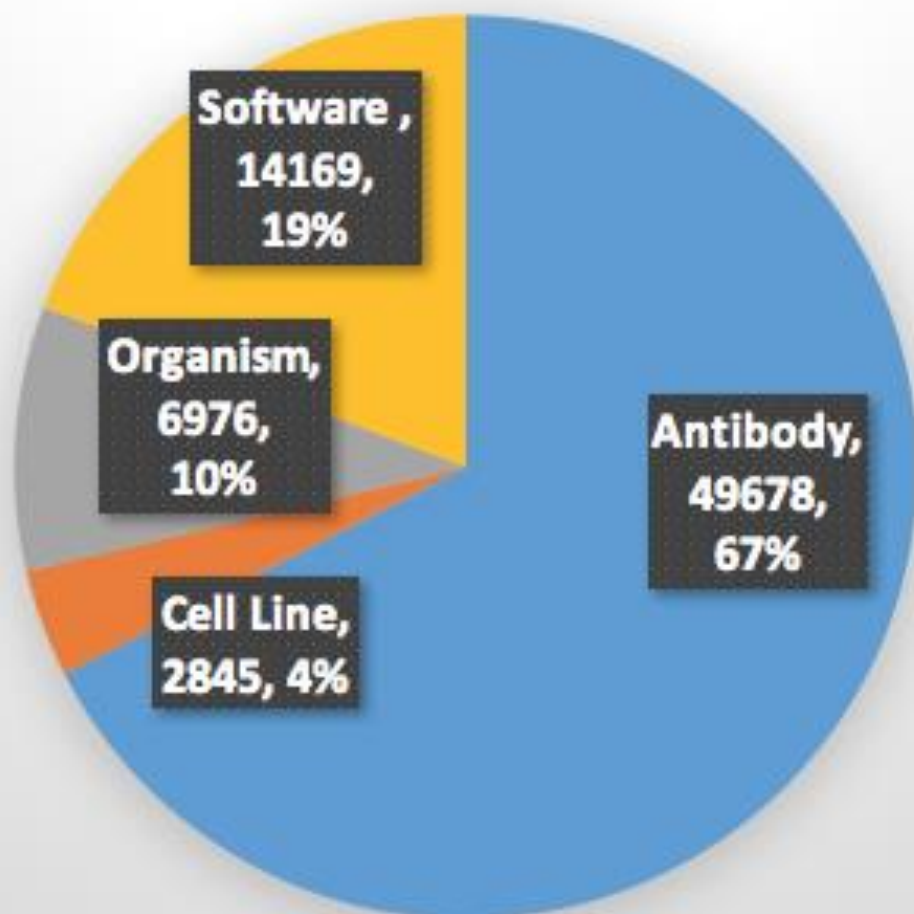Number of journals and papers published with RRIDs per year
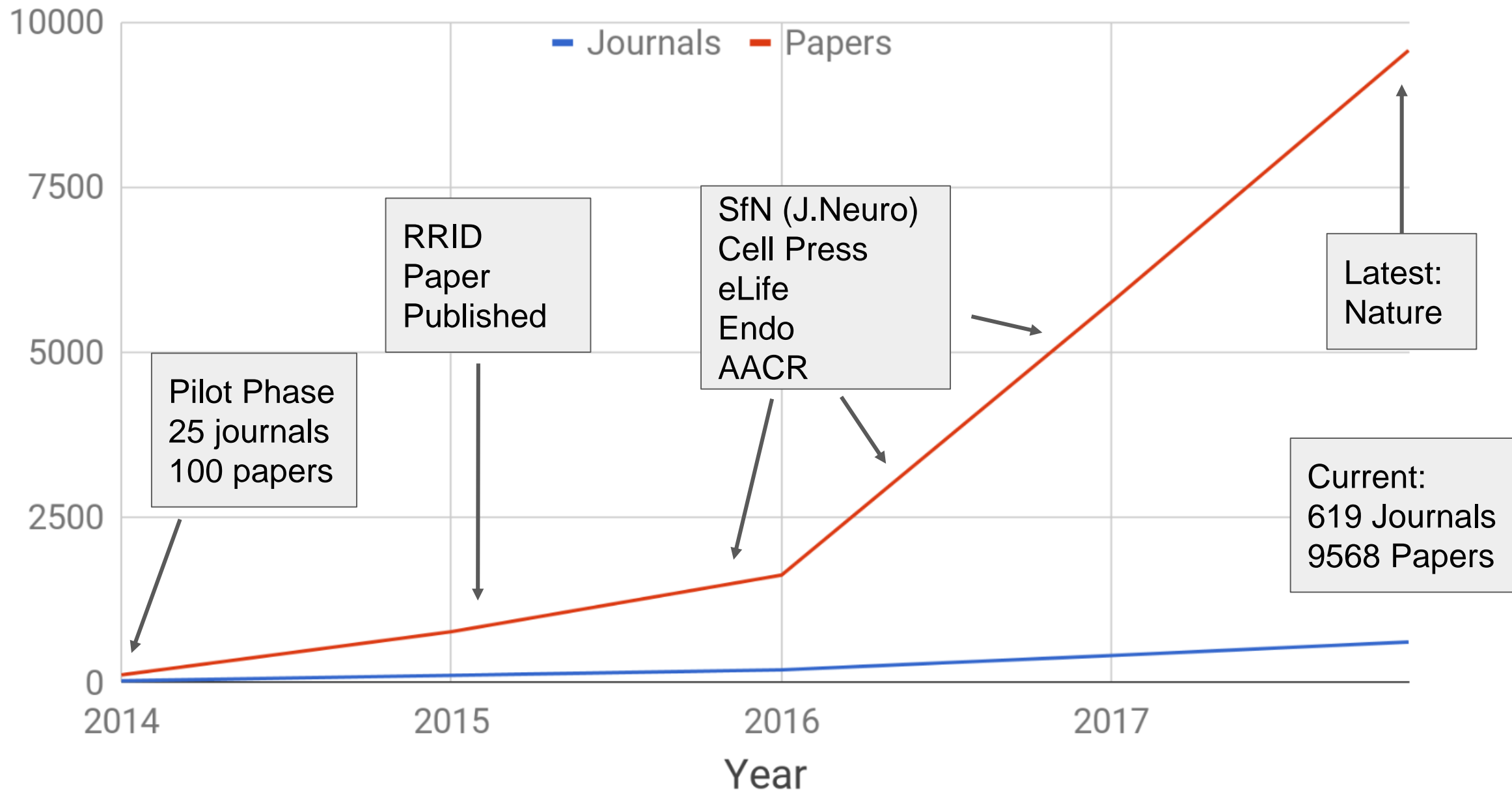
Percent of RRID papers citing JAX, MMRRC and BDSC in PubMed Central
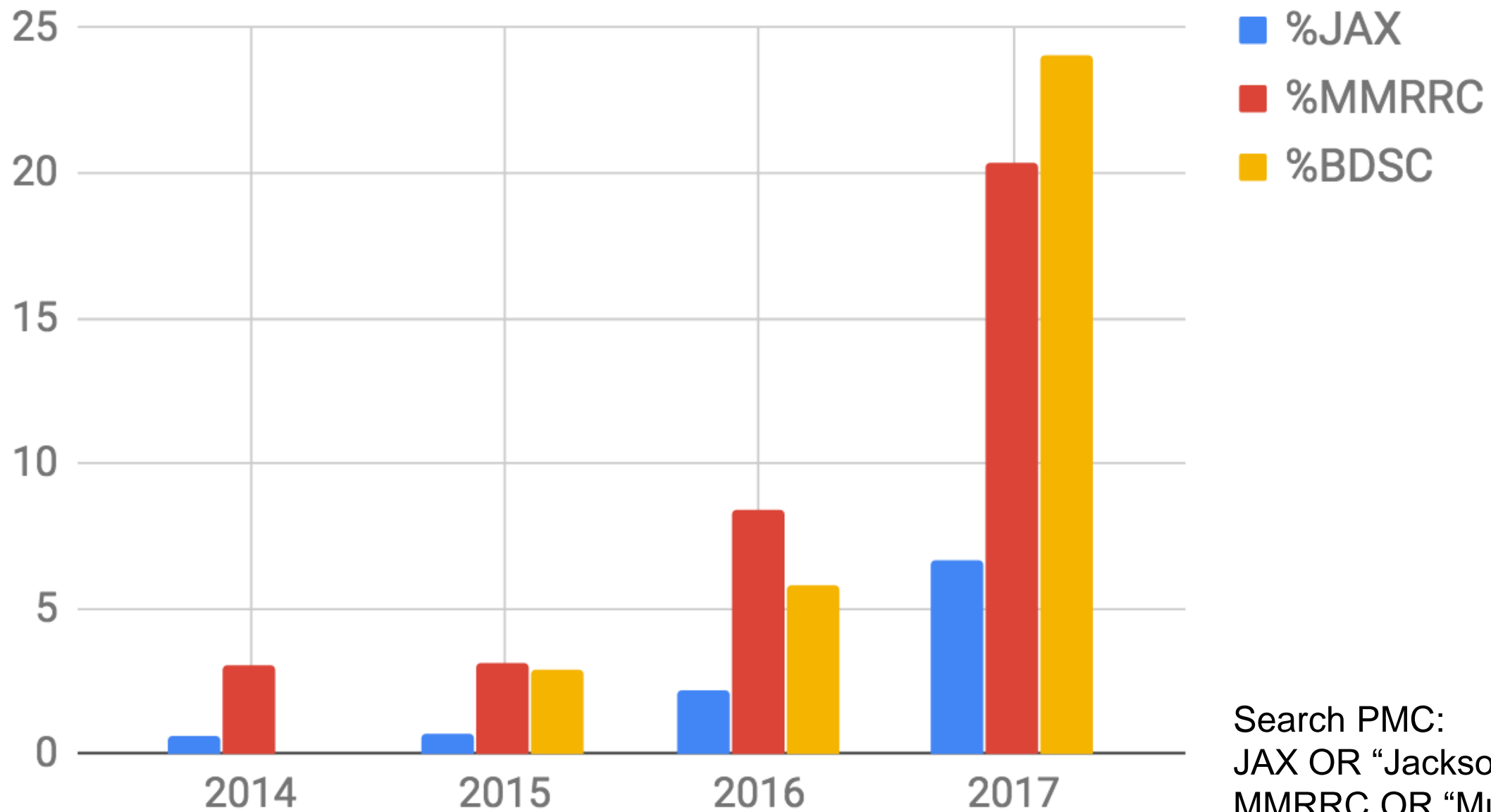
Search PMC:
JAX OR "Jackson Laborat
MMRRC OR "Mutant Mou
BDSC OR "Bloomington D

Use of RRIDs in the literature

Pie chart:
- Antibody, 49678, 67%
- Software, 14169, 19%
- Organism, 6976, 10%
- Cell Line, 2845, 4%

RRID	Tool Name	Papers
SCR_002798	GraphPad Prism	1026
SCR_003070	ImageJ	858
SCR_001622	MATLAB	604
SCR_001905	R Project	356
SCR_002285	Fiji	321
SCR_014199	Adobe Photoshop	283
SCR_002865	SPSS	221
SCR_008520	FlowJo	216
SCR_002427	ANOVA	165
SCR_005476	Bowtie	155
SCR_007370	Imaris	148
SCR_011323	pClamp	142
SCR_013035	TopHat	129
SCR_002105	SAMTOOLS	121
SCR_013672	ZEN Digital Imaging	104

RRIDs have been used in 9,568 papers (data from 7,681)
Data from Total RRIDs: 73,620

https://scholar.google.nl/scholar?hl=en&as_sdt=0%2C5&q=RRID%3A+SCR_001622&btnG=

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✎ AE Bandrowski

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🖨 Public record print view ❓

▦ Get a QR Code for your iD ❓

✎ **Also known as**

Anita E Bandrowski, Anita

NIFSTD and neurolex: A comprehensive neuroscience ontology development based on multiple biomedical ontologies and community involvement

CEUR Workshop Proceedings

2011 | journal-article

URL: http://www.scopus.com/inward/record.url?eid=2-s2.0-84891935325&partnerID=MN...

Source: Scopus to ORCID   ☑ Preferred source

The AntibodyRegistry Database

SciCrunch

2009 | other

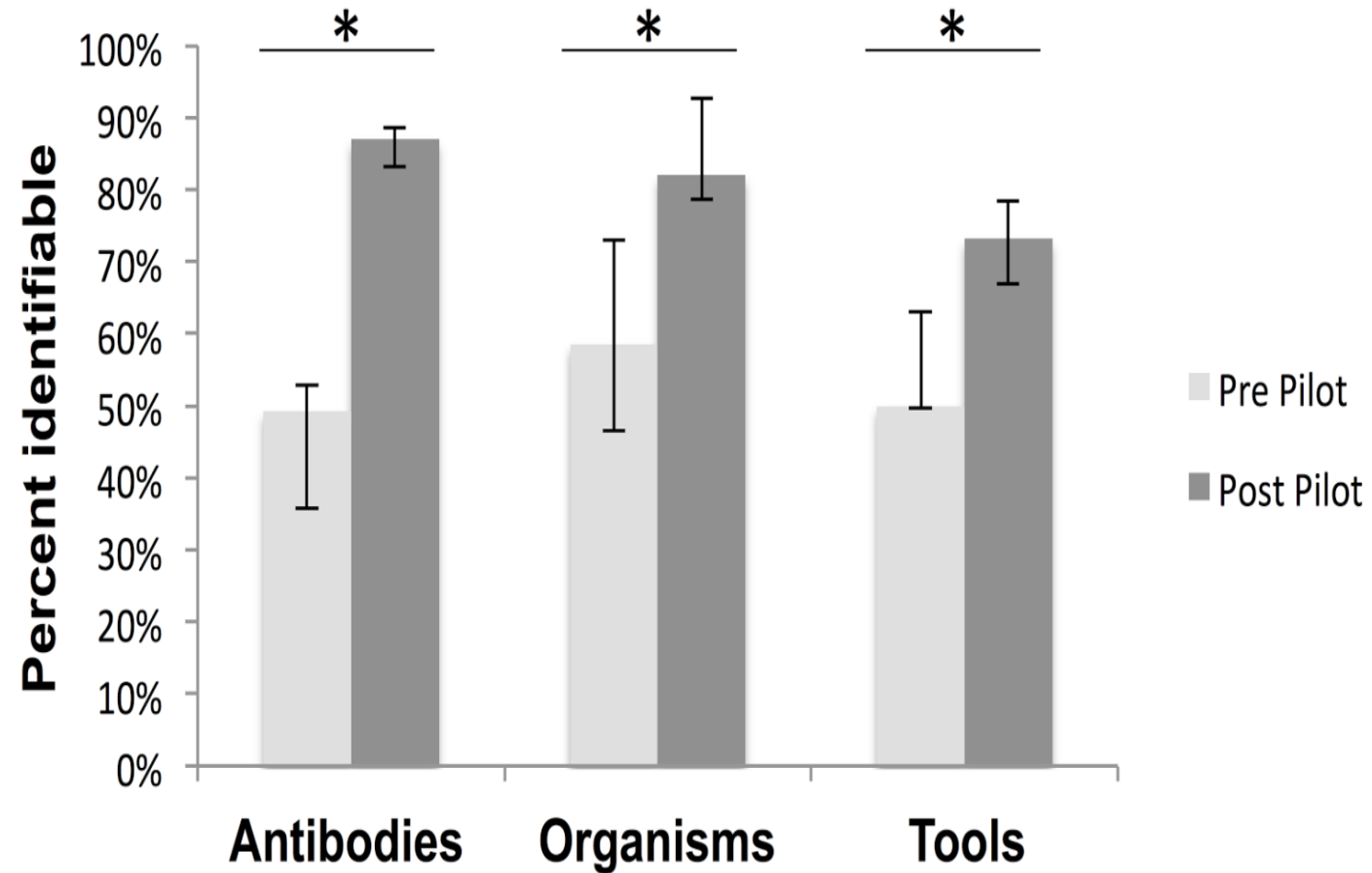RRID: RRID:SCR_006397

URL: http://antibodyregistry.org

Source: AE Bandrowski

RRIDs now are allowed as "other" works in ORCID (full integration 2018)

Neuroscience Information Framework

Resources are identifiable!

To use RRIDs in your research objects

To add / ask for RRIDs (authors / reviewers)
To bring your journal (editors)

Comments:
abandrowski@ncmir.ucsd.edu