SourceData – bridging scientific publishing and open science

Dr. Thomas Lemberger
EMBO

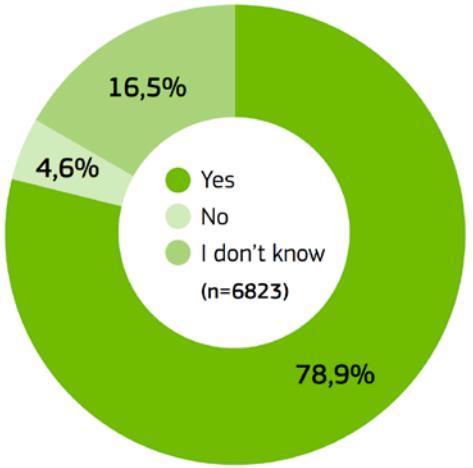
1. Open Science
2. SourceData
3. Outlook

1. Open science

SOURCE DATA
Making data discoverable

EMBO

Open **Science**

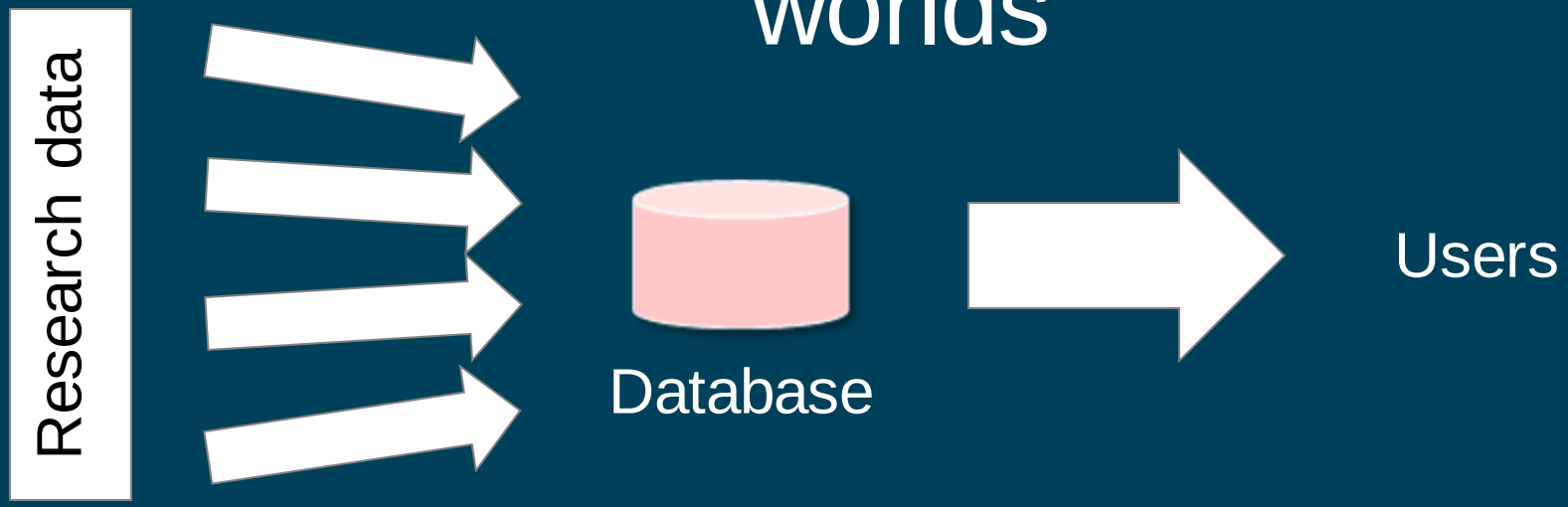


Do you support the goal of Open Science?

i.e. openly creating, sharing and assessing research, wherever viable

Data are from the Survey of scholarly communication tool usage. https://101innovations.wordpress.com/2016/04/04/support-for-open-science-in-eu-member-states/

Data & publishing: separate worlds



Data & publishing: separate worlds

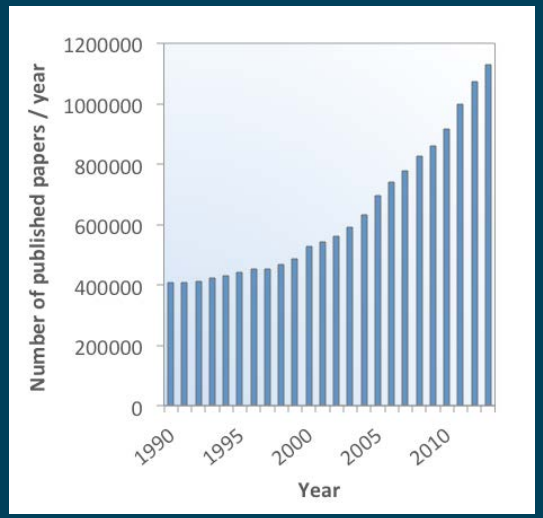
Research data

Database

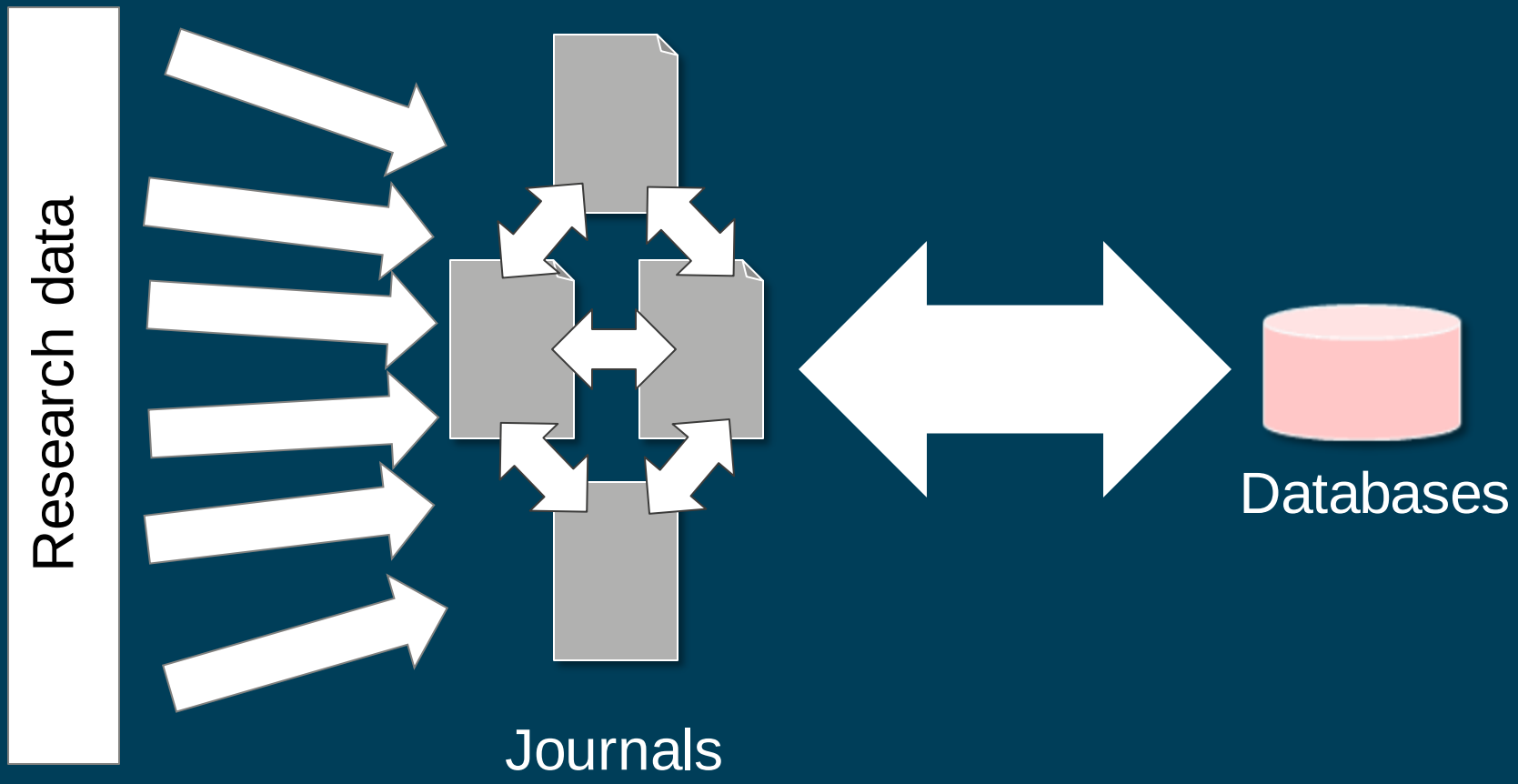
Users

Research data

Journals



Bridging publishing and open data



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ORIGINAL ARTICLE

Improved Overall Survival in Melanoma with Combined Dabrafenib and Trametinib

Caroline Robert, M.D., Ph.D., Boguslawa Karaszewska, M.D., Jacob Schachter, M.D., Piotr Rutkowski, M.D., Ph.D., Andrzej Mackiewicz, M.D., Ph.D., Daniil Stroiakovski, M.D., Michael Lichinitser, M.D., Reinhard Dummer, M.D., Florent Grange, M.D., Ph.D., Laurent Mortier, M.D., Vanna Chiarion-Sileni, M.D., Kamil Drucis, M.D., Ph.D., Ivana Krajsova, M.D., Axel Hauschild, M.D., Ph.D., Paul Lorigan, M.D., Pascal Wolter, M.D., Georgina V. Long, M.D., Ph.D., Keith Flaherty, M.D., Paul Nathan, M.D., Ph.D., Antoni Ribas, M.D., Ph.D., Anne-Marie Martin, Ph.D., Peng Sun, Ph.D., Wendy Crist, B.A., Jeff Legos, Ph.D., Stephen D. Rubin, M.D., Shonda M. Little, M.P.H., and Dirk Schadendorf, M.D.

ABSTRACT

BACKGROUND

The BRAF inhibitors vemurafenib and dabrafenib have shown efficacy as monotherapies in patients with previously untreated metastatic melanoma with *BRAF* V600E or V600K mutations. Combining dabrafenib and the MEK inhibitor trametinib, as compared with dabrafenib alone, enhanced antitumor activity in this population of patients.

METHODS

In this open-label, phase 3 trial, we randomly assigned 704 patients with metastatic melanoma with a *BRAF* V600 mutation to receive either a combination of dabrafenib (150 mg twice daily) and trametinib (2 mg once daily) or vemurafenib (960 mg twice daily) orally as first-line therapy. The primary end point was overall survival.

RESULTS

At the preplanned interim overall survival analysis, which was performed after 77% of the total number of expected events occurred, the overall survival rate at 12 months was 72% (95% confidence interval [CI], 67 to 77) in the combination-therapy group and 65% (95% CI, 59 to 70) in the vemurafenib group (hazard ratio for death in the combination-therapy group, 0.69; 95% CI, 0.53 to 0.89; P=0.005). The prespecified interim stopping boundary was crossed, and the study was stopped for efficacy in July 2014. Median progression-free survival was 11.4 months in the combination-therapy group and 7.3 months in the vemurafenib group (hazard ratio, 0.56; 95% CI, 0.46 to 0.69; P<0.001). The objective response rate was 64% in the combination-therapy group and 51% in the vemurafenib group (P<0.001). Rates of severe adverse events and study-drug discontinuations were similar in the two groups. Cutaneous squamous-cell carcinoma and keratoacanthoma occurred in 1% of patients in the combination-therapy group and 18% of those in the vemurafenib group.

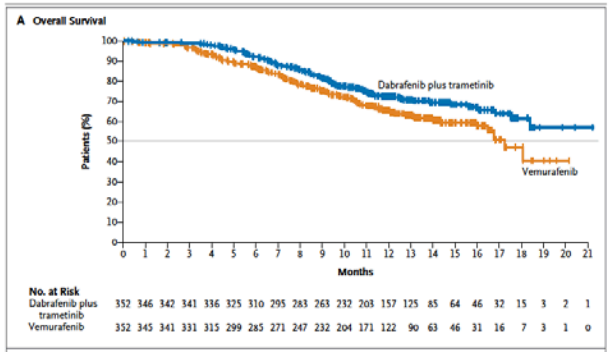
CONCLUSIONS

Dabrafenib plus trametinib, as compared with vemurafenib monotherapy, significantly improved overall survival in previously untreated patients with metastatic melanoma with *BRAF* V600E or V600K mutations, without increased overall toxicity. (Funded by GlaxoSmithKline; ClinicalTrials.gov number, NCT01597908.)

The authors' affiliations are listed in the Appendix. Address reprint requests to Dr. Robert at the Dermatology Service and INSERM Unité 981, Gustave Roussy, 114 rue Edouard Vaillant, 94 805 Villejuif-Paris Sud, France, or at caroline.robert@gustaveroussy.fr.

This article was published on November 16, 2014, at NEJM.org.

N Engl J Med 2015;372:30-9.
DOI: 10.1056/NEJMoa1412690



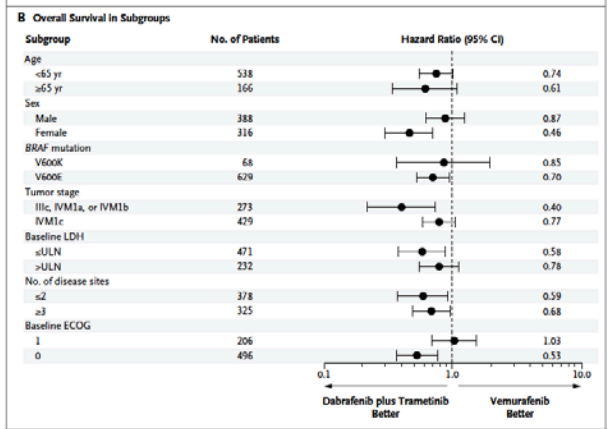


Figure 1. Overall Survival in the Intention-to-Treat Population and Prespecified Subgroups.

Panel A shows Kaplan–Meier estimates of overall survival in the intention-to-treat population among patients receiving combination therapy with dabrafenib plus trametinib versus those receiving vemurafenib monotherapy. The hazard ratio for death in the combination-therapy group was 0.69 (95% confidence interval, 0.53 to 0.89; P=0.005). The tick marks indicate the dates on which data were censored. Panel B shows hazard ratios and 95% confidence intervals for overall survival in prespecified subgroups of patients, according to various baseline characteristics. ECOG denotes Eastern Cooperative Oncology Group, LDH lactate dehydrogenase, and ULN upper limit of the normal range.

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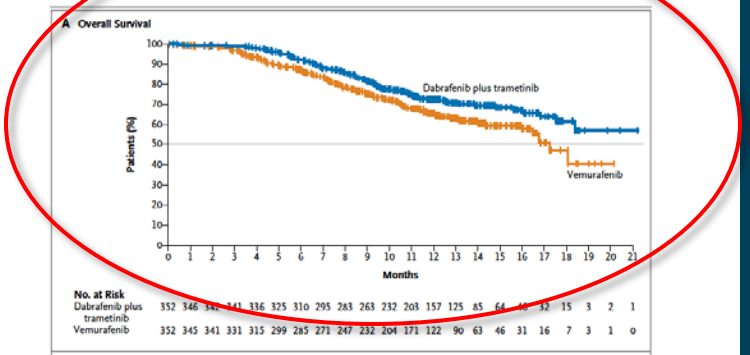

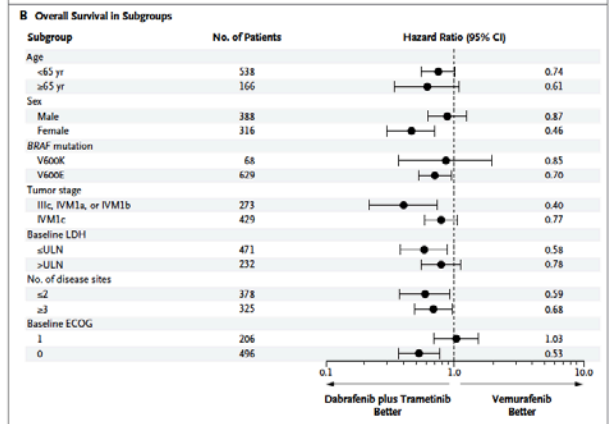

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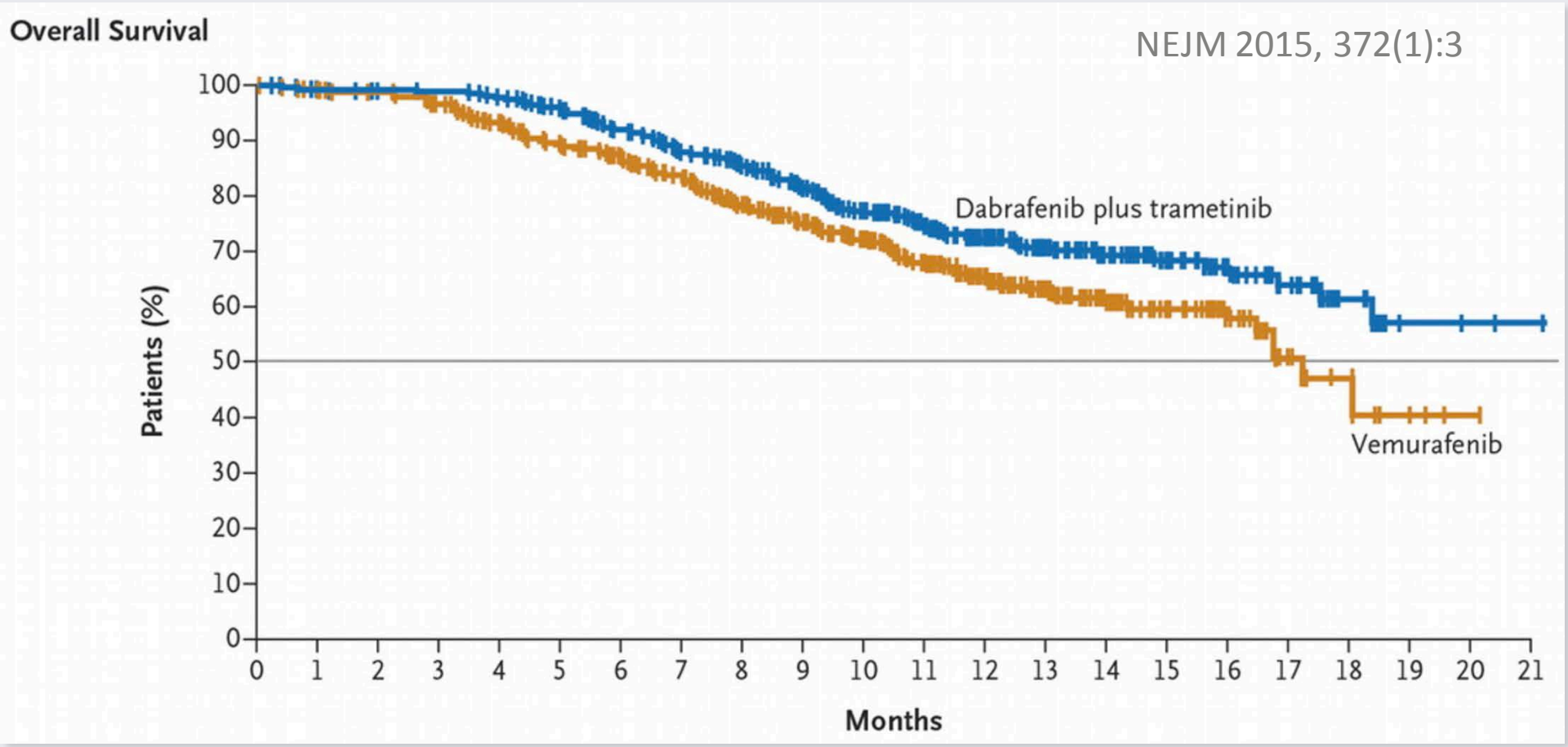
What is a figure?



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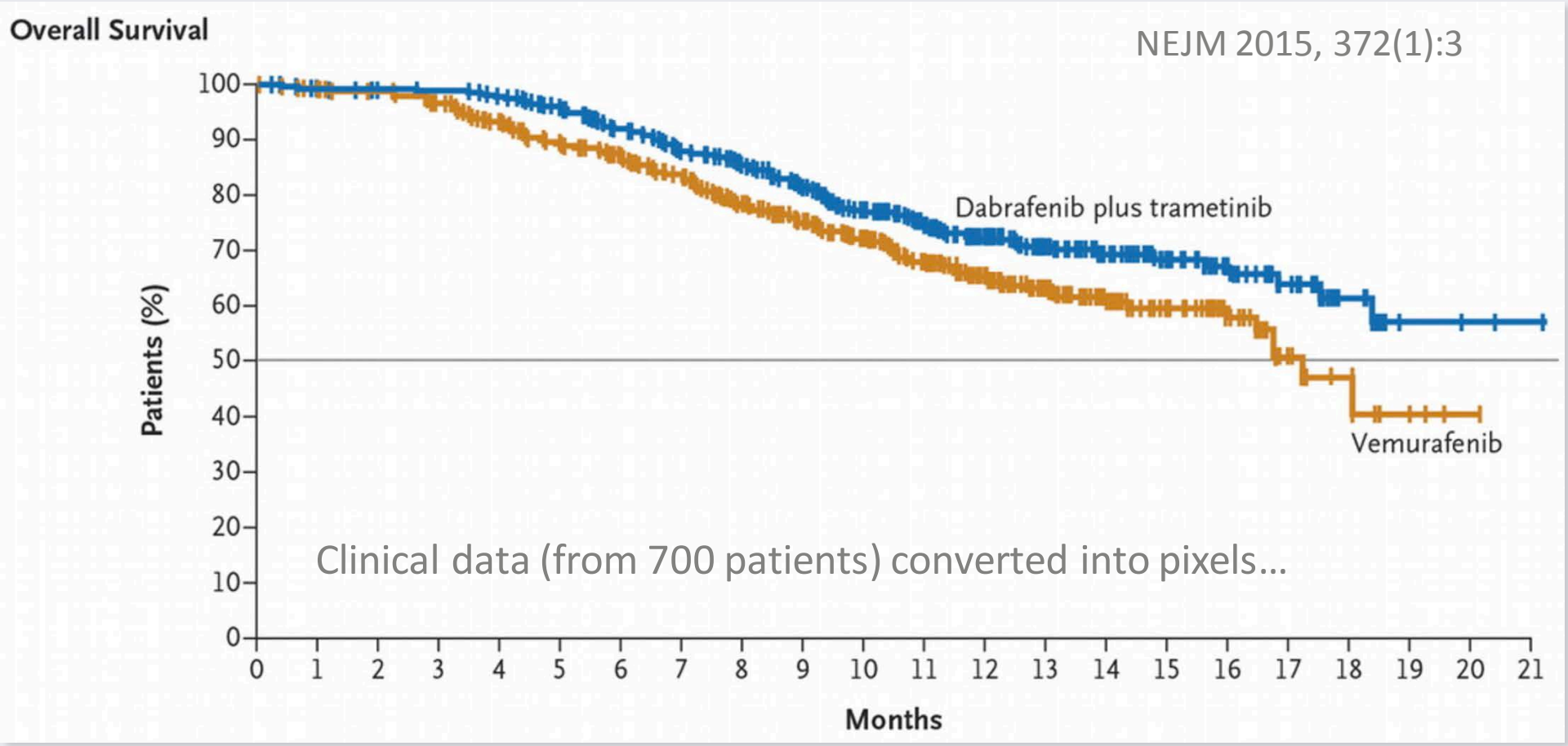
What is a figure?



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2. SourceData

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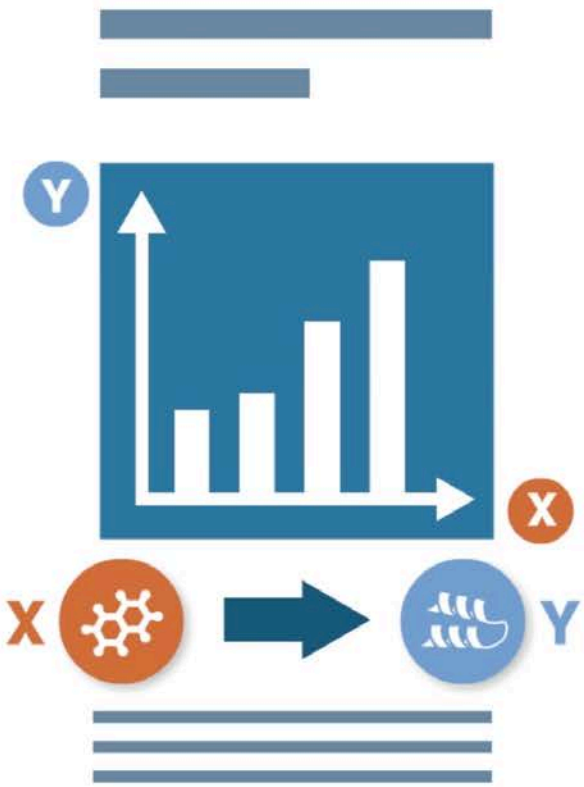
ALPSP Awards for Innovation in Publishing 2017
WINNER
Sponsored by MPS

Liechti et al. 2017
Nature Methods **14**:1021



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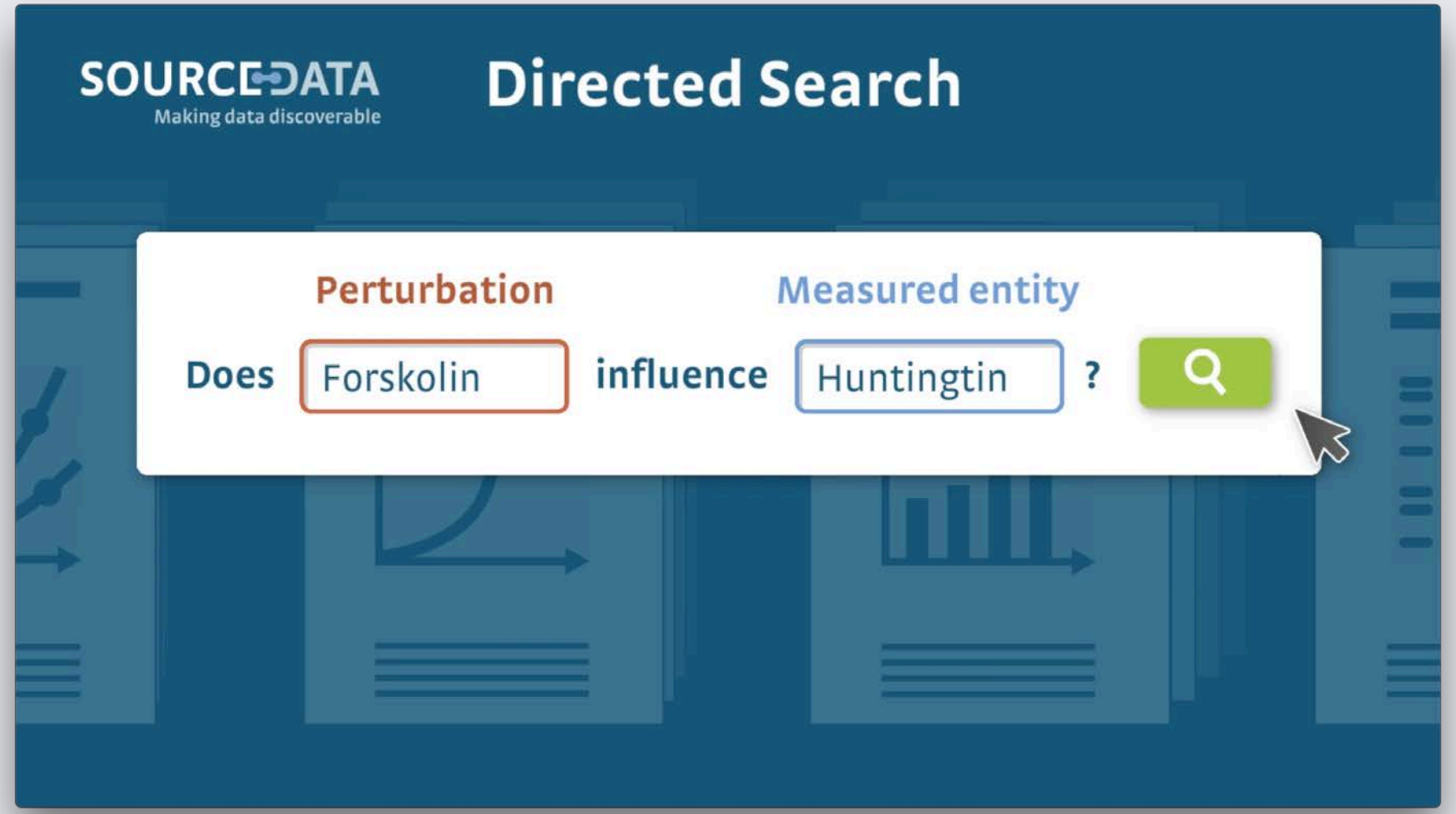

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Directed Search

Perturbation | Measured entity

Does [Forskolin] influence [Huntingtin] ?

Search results

X Forskolin — 5 Experiments → Y Huntingtin

Novel targets for Huntington's disease in an mTOR-independent autophagy pathway

Williams E et al.
Nature Chemical Biology 2008

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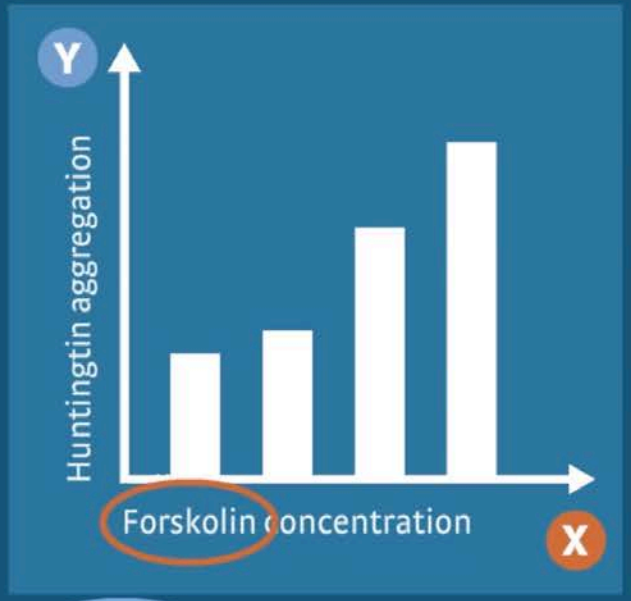
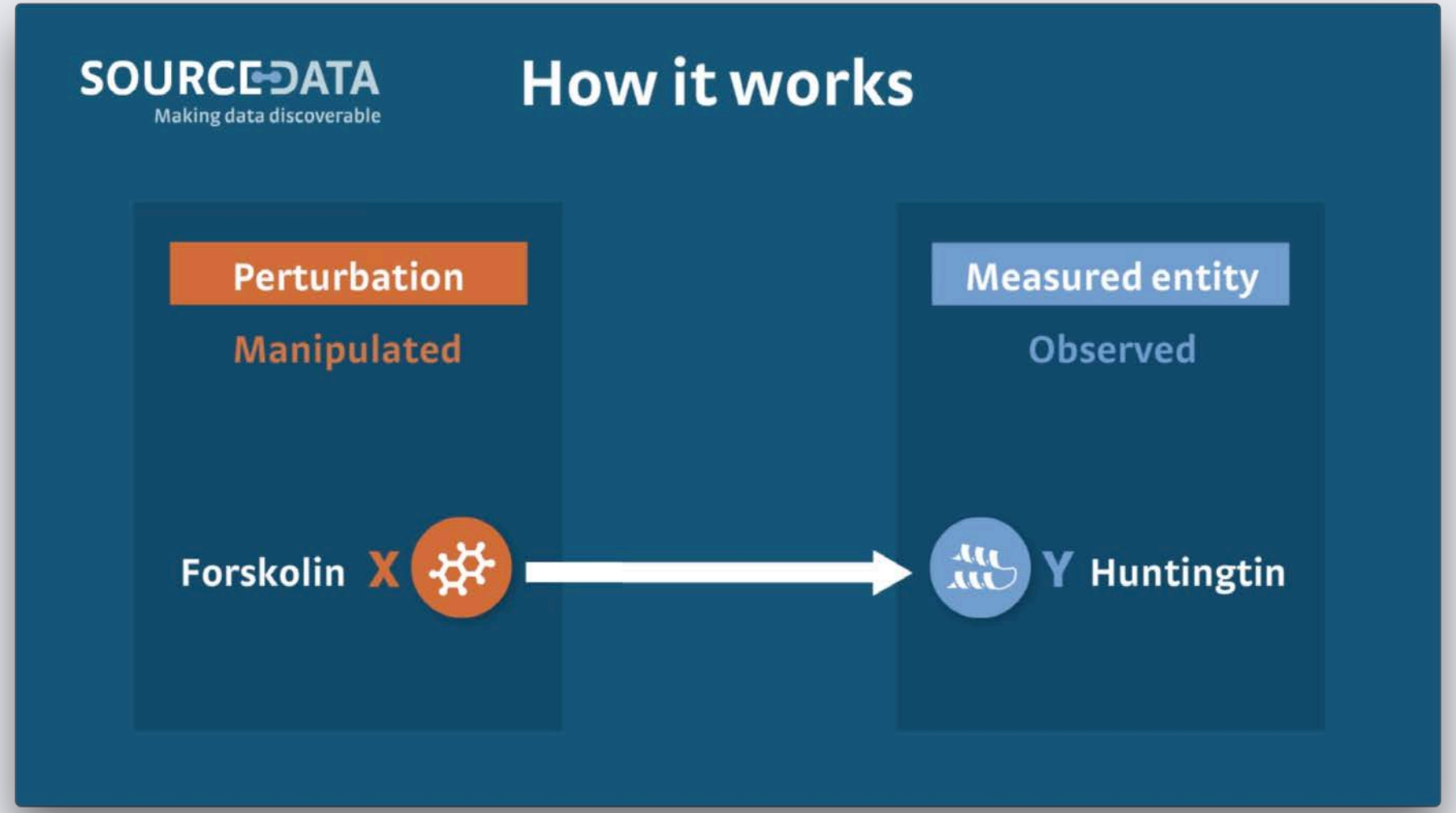
How it works



Huntingtin aggregates after treatment with forskolin.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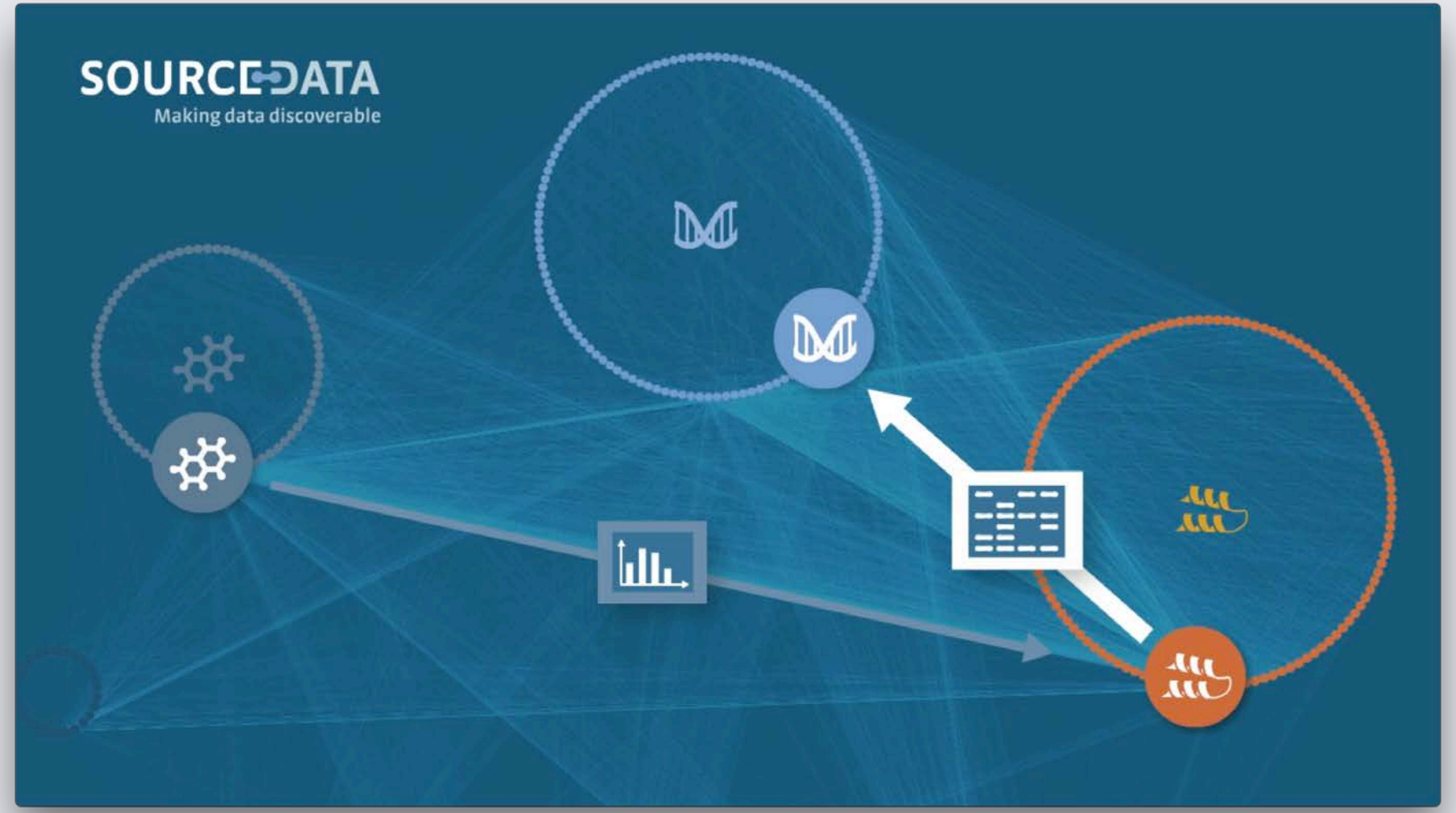
Making data discoverable
How it works
Perturbation
Manipulated
Measured entity
Observed
Forskolin X
Y Huntingtin



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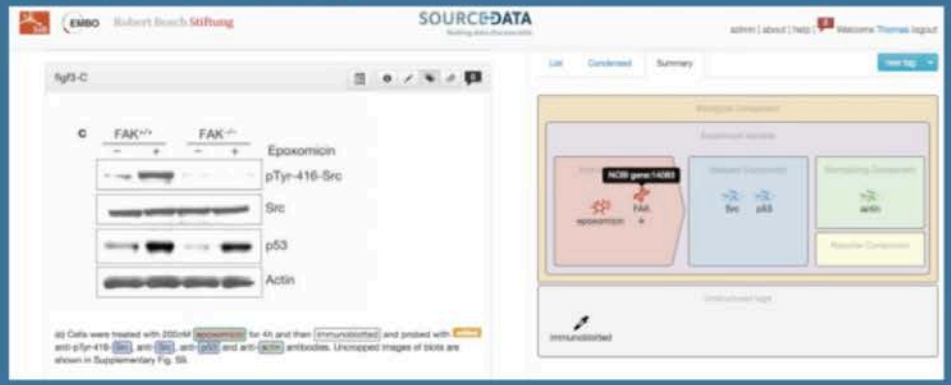
Liechti et al. (2017). *Nature Methods* **14**:1021

SmartFigures smartfigures.net

Data search sourcedata.vital-it.ch/public/#/search

Curation interface sourcedata.vital-it.ch/#/login



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SIB Swiss Institute of Bioinformatics

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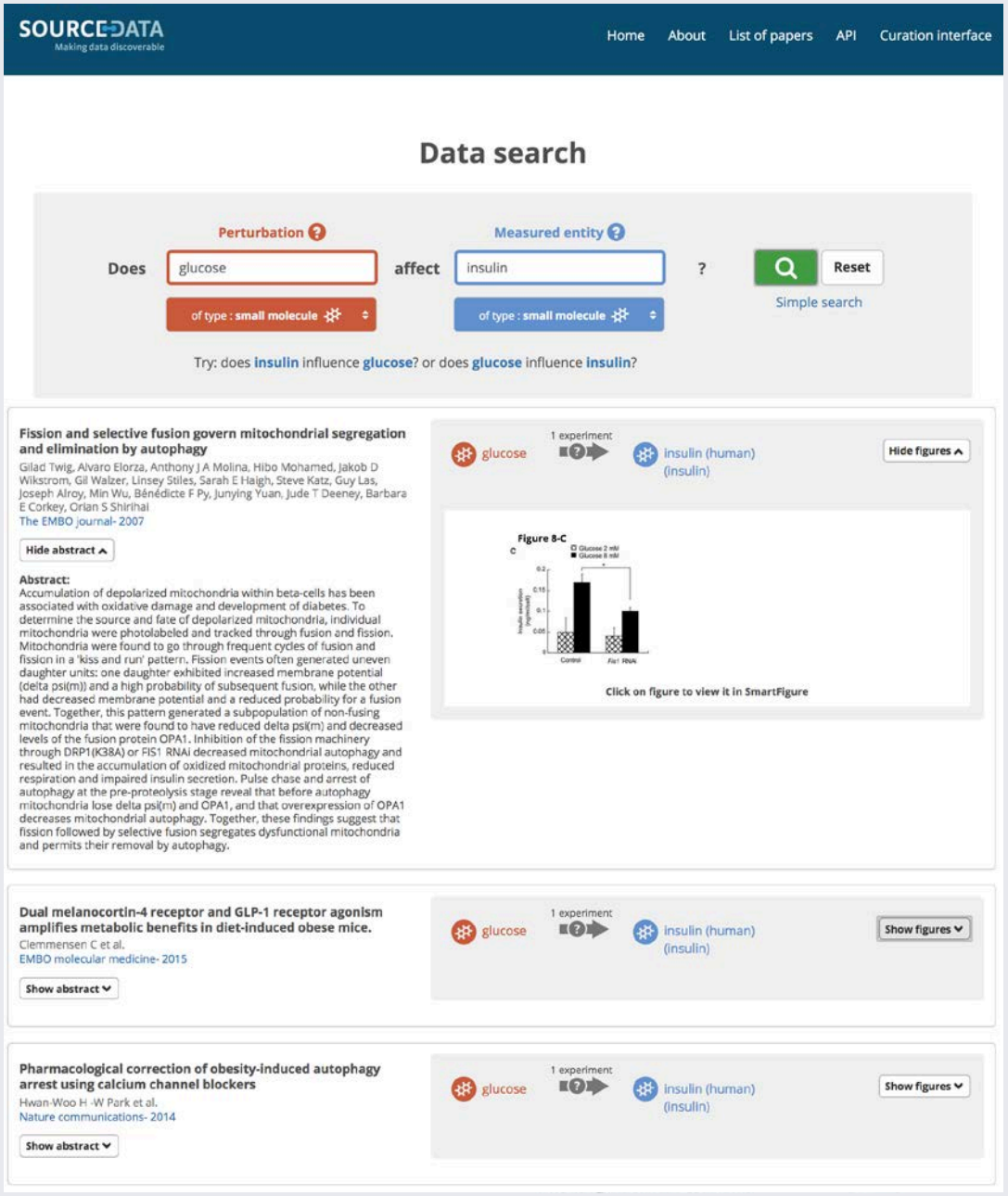
DataSearch



sourcedata.embo.org

DataSearch

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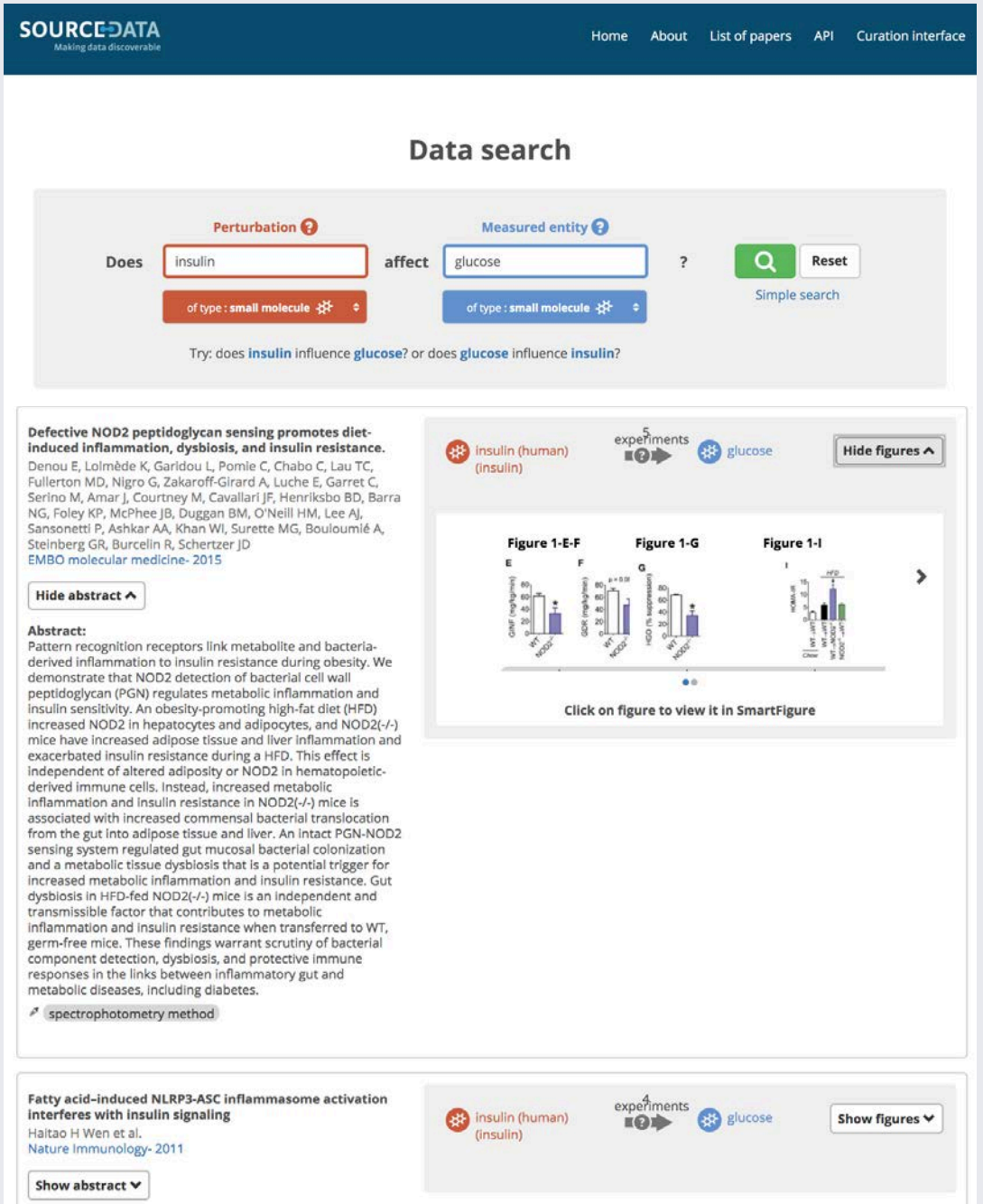
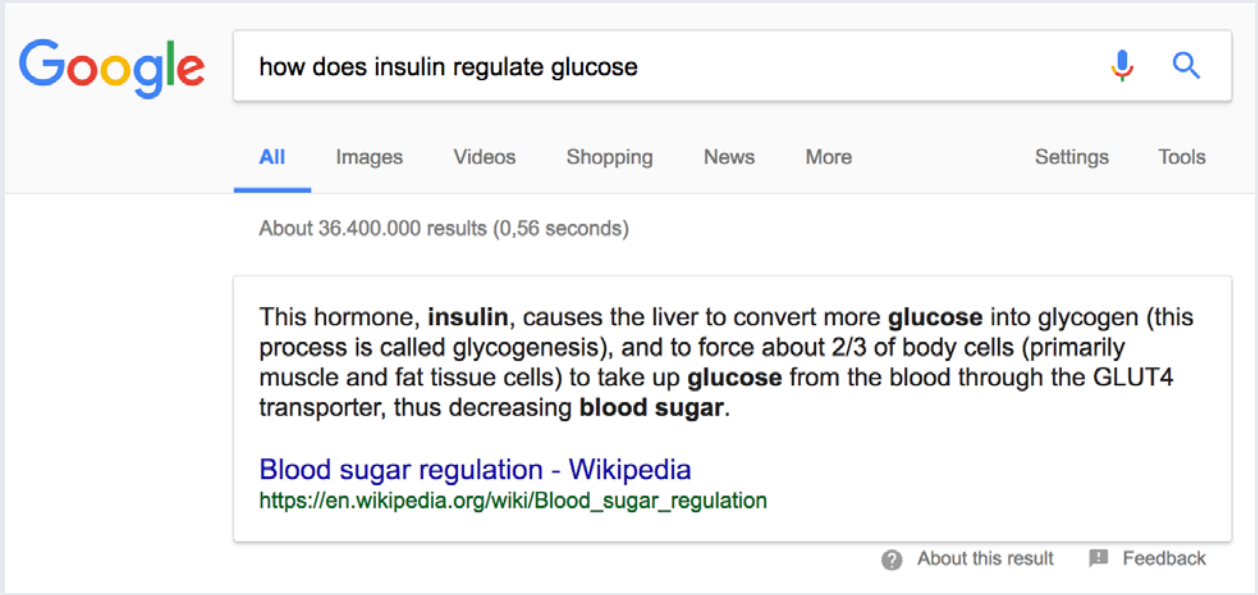
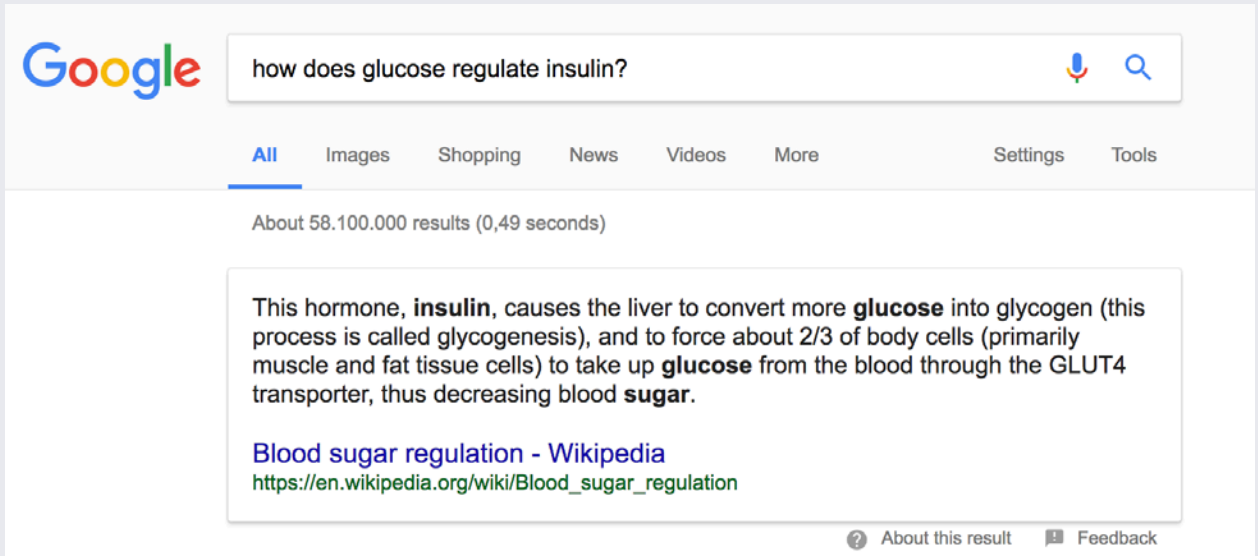



Google
how does insulin regulate glucose
All
Images
Videos
Shopping
News
More
Settings
Tools
About 36.400.000 results (0,56 seconds)
This hormone, insulin, causes the liver to convert more glucose into glycogen (this process is called glycogenesis), and to force about 2/3 of body cells (primarily muscle and fat tissue cells) to take up glucose from the blood through the GLUT4 transporter, thus decreasing blood sugar.
Blood sugar regulation - Wikipedia
https://en.wikipedia.org/wiki/Blood_sugar_regulation
About this result
Feedback


Google
how does glucose regulate insulin?
All
Images
Shopping
News
Videos
More
Settings
Tools
About 58.100.000 results (0,49 seconds)
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Blood sugar regulation - Wikipedia
https://en.wikipedia.org/wiki/Blood_sugar_regulation
About this result
Feedback

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SmartFigure

Overexpression of Atg5 in mice activates autophagy and extends lifespan

Pyo JO et al. Nature communications 2013

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f3 View full figure

Intervention

insulin

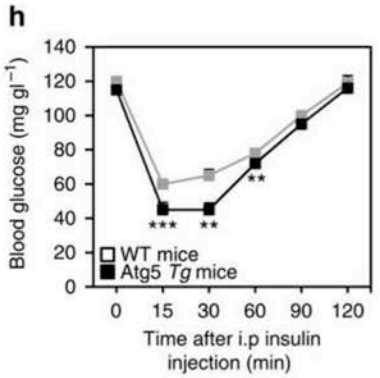
Entity Info

Explore

Atg5

f3-H

highlight entities



(**h**) Enhanced insulin sensitivity of Atg5 *Tg* mice. WT and Atg5 *Tg* mice were starved for 6 h and then i.p injected with 0.75 IU soluble insulin. *P0.01, **P0.001 versus control; Student's *t*-test.

spectrophotometry method

Assayed

glucose

Entity Info

Explore

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Intervention
insulin
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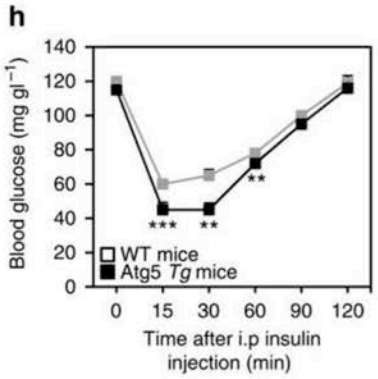
Atg5

f3-H
highlight entities



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spectrophotometry method

Assayed
glucose
Entity Info
Explore

upstream

downstream

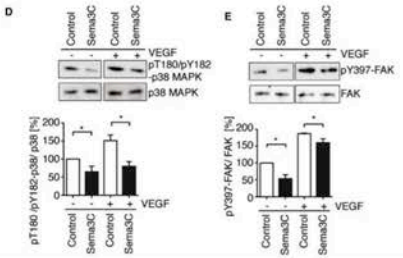
similar

Semaphorin-3C signals through Neuropilin-1 ap[illegible]recept
pathological angiogenesis.
Yang WJ et al. *EMBO molecular medicine* 2015

Figure 5 | Panel | Su

Intervention
Sema...
VEGF

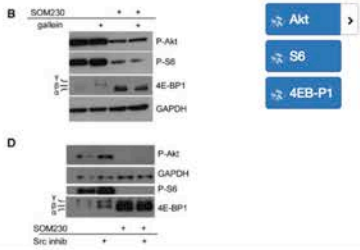
Figure 5-D-E



[illegible]otein sy[illegible]QR/4E-BP1 pathway in
[illegible]gates panc[illegible]u[illegible]chemoresistance.

Panel | Summary | History

Assayed
Akt
S6
4EB-P1



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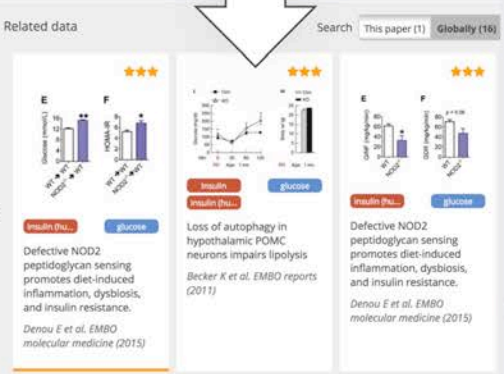

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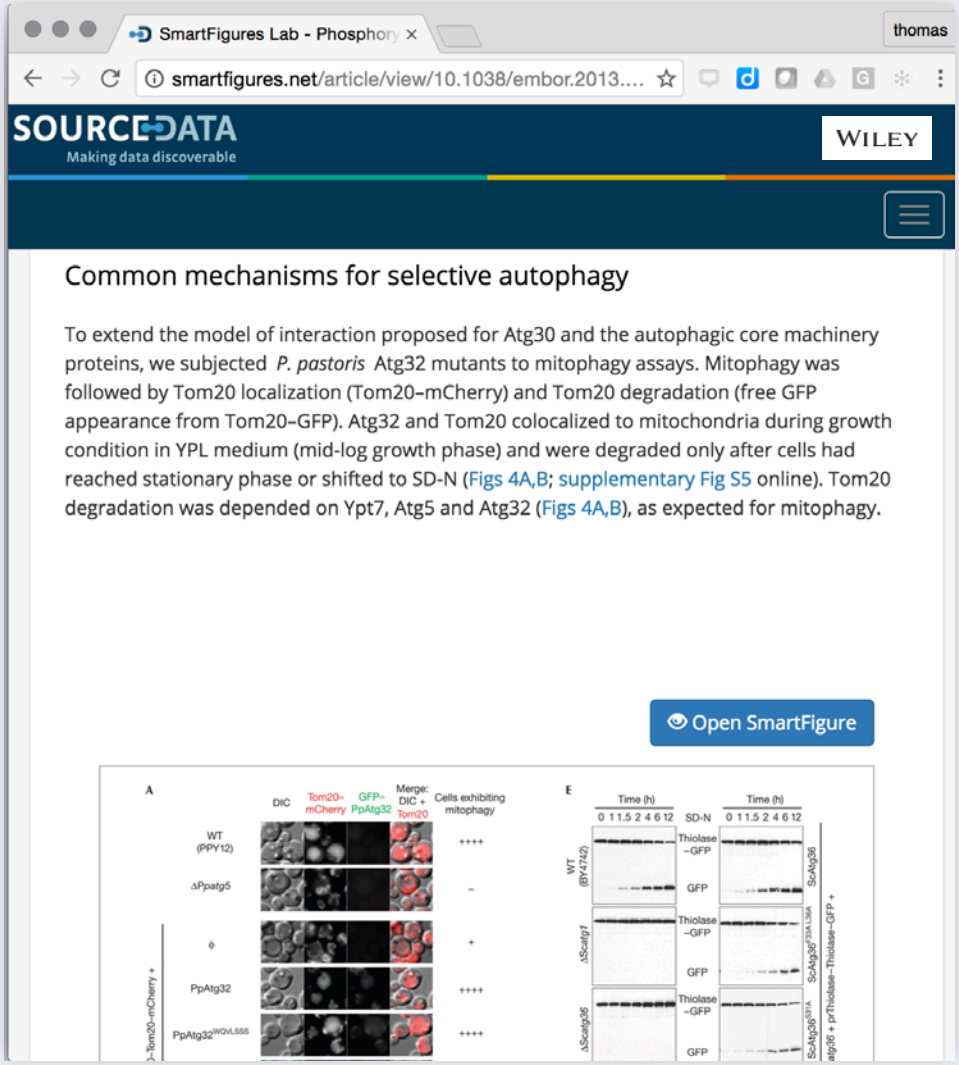
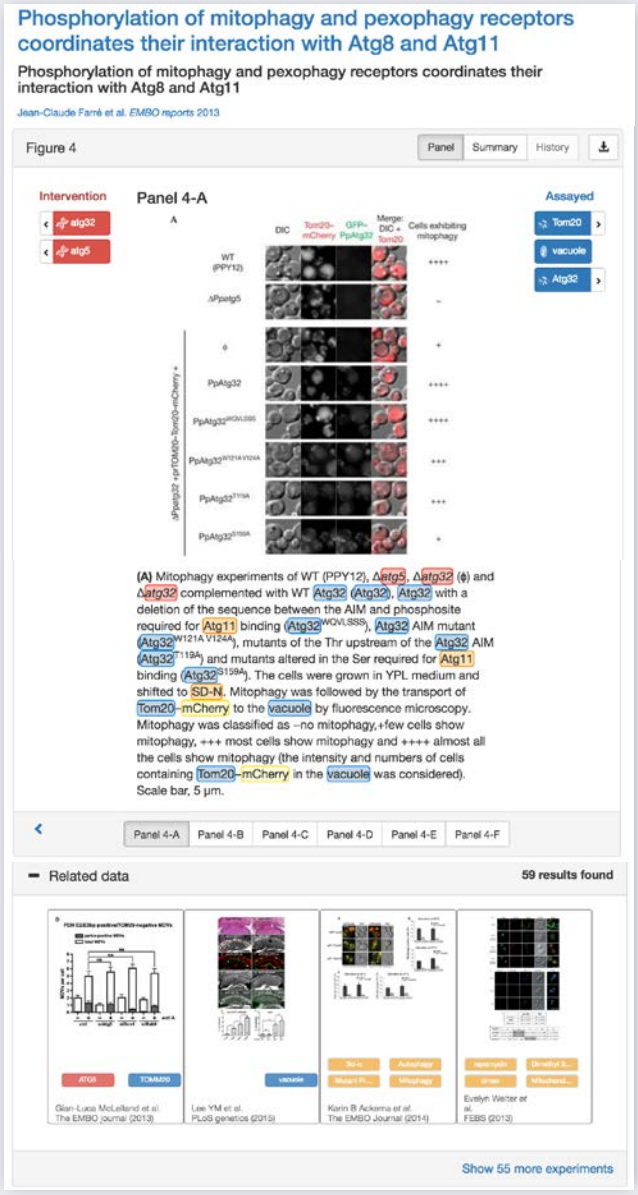
A pilot implementation: smartfigures.net

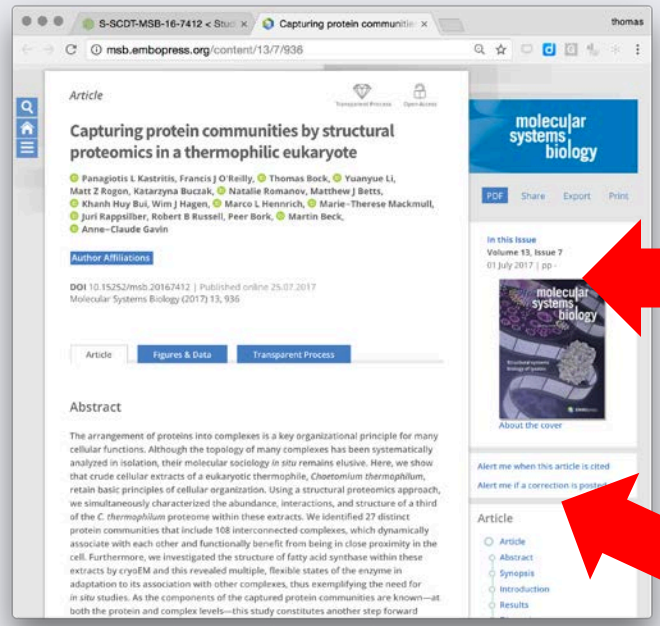


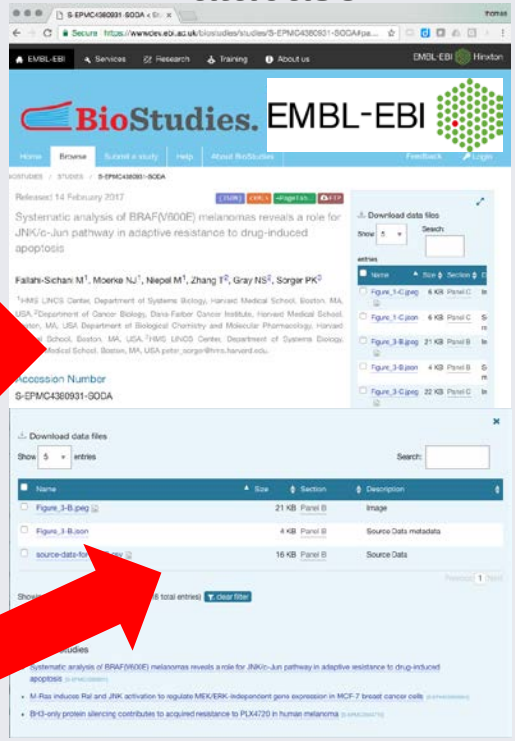


Integration with data repositories

Paper

Database





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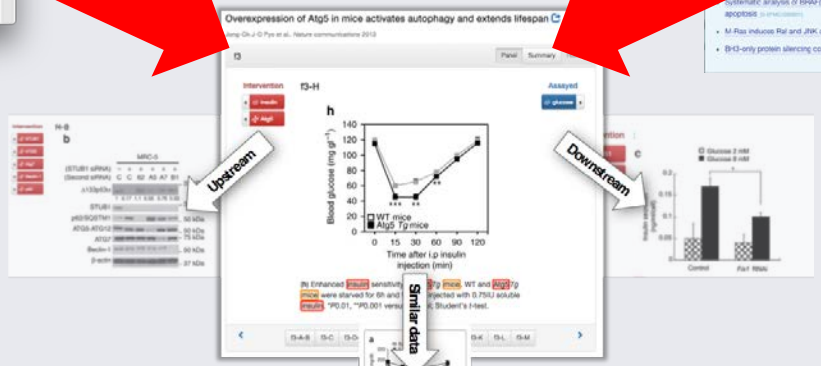

https://wwwdev.ebi.ac.uk/biostudies/studies/S-SCDT-MSB-16-7412

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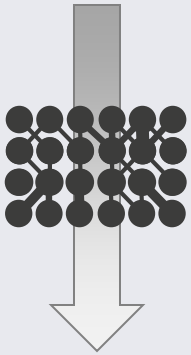
An AI approach to semantic analysis

Training set
(20'000 examples)

Artificial neural
network



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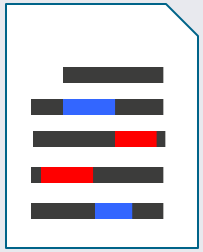

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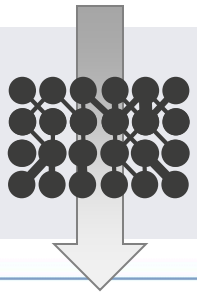
An AI approach to semantic analysis

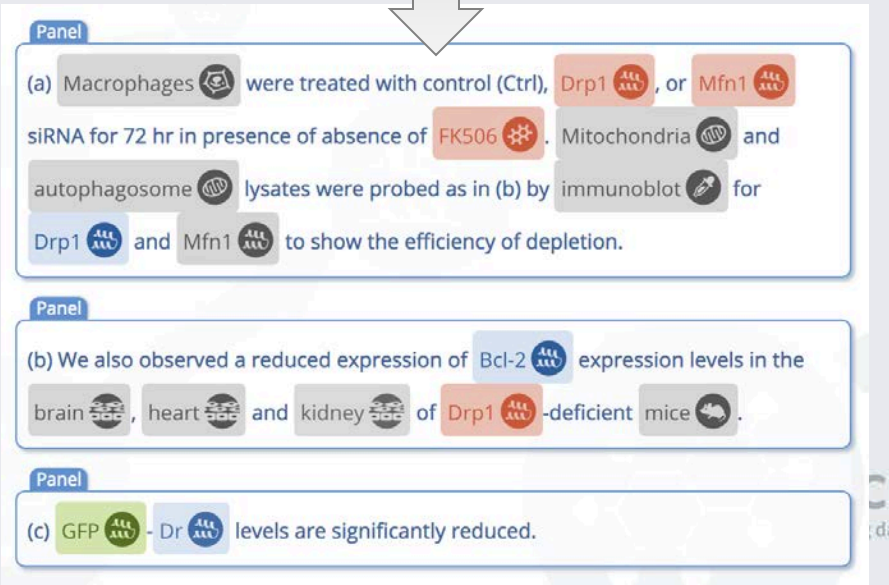
Plain text (figure legend)

(a) Macrophages were treated with control (Ctrl), Drp1, or Mfn1 siRNA for 72 hr in presence of absence of FK506. Mitochondria and autophagosome lysates were probed as in (b) by immunoblot for Drp1 and Mfn1 to show the efficiency of depletion. (b) We also observed a reduced expression of Bcl-2 expression levels in the brain, heart and kidney of Drp1-deficient mice. (c) GFP-Dr levels are significantly reduced.

Artificial neural network



SmartTag: deep semantic interpretation



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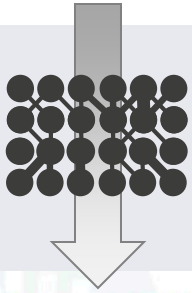
An AI approach to semantic analysis

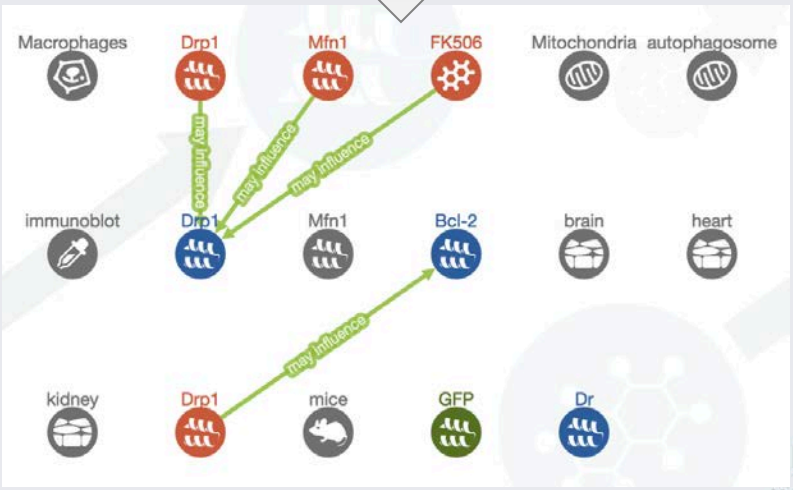
Plain text
(figure legend)

(a) Macrophages were treated with control (Ctrl), Drp1, or Mfn1 siRNA for 72 hr in presence of absence of FK506. Mitochondria and autophagosome lysates were probed as in (b) by immunoblot for Drp1 and Mfn1 to show the efficiency of depletion. (b) We also observed a reduced expression of Bcl-2 expression levels in the brain, heart and kidney of Drp1-deficient mice. (c) GFP-Dr levels are significantly reduced.

Artificial neural network



SmartTag:
deep semantic
interpretation



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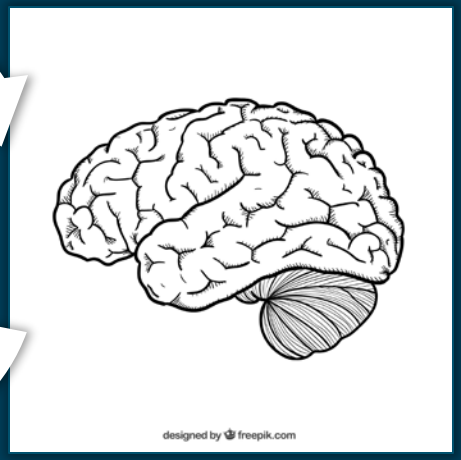

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3. Outlook

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Abstract

Main paper

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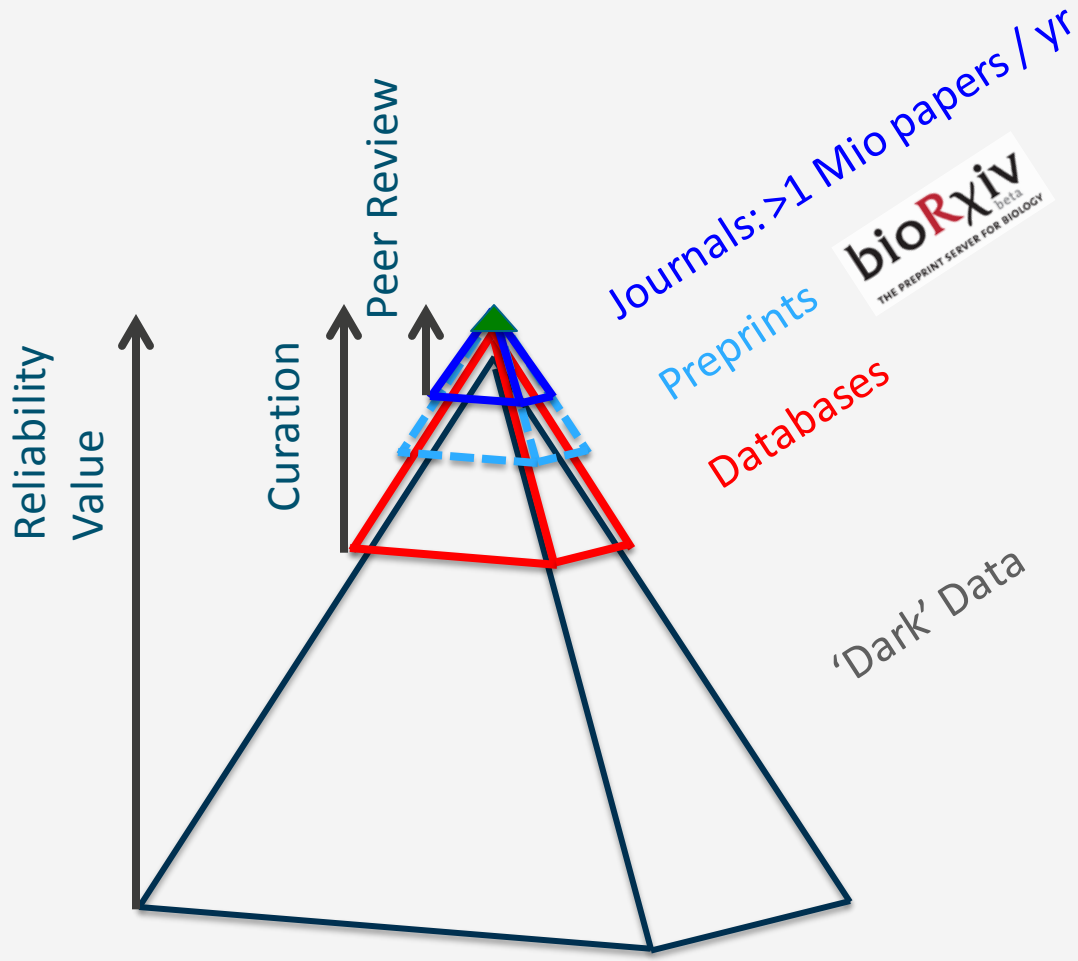
Accelerating science with Open Science



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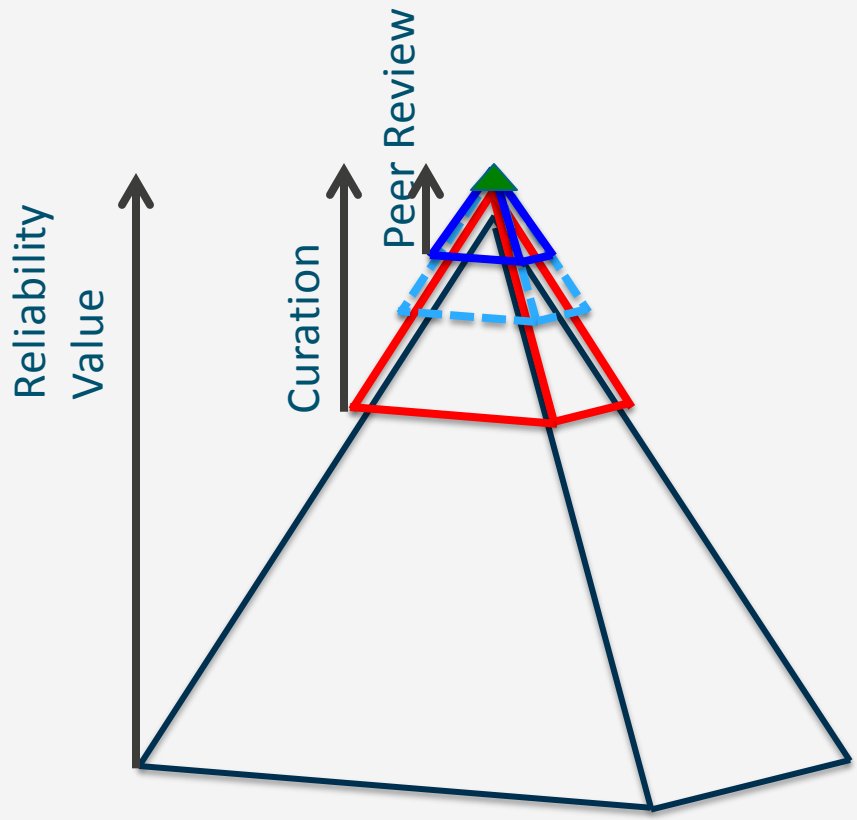

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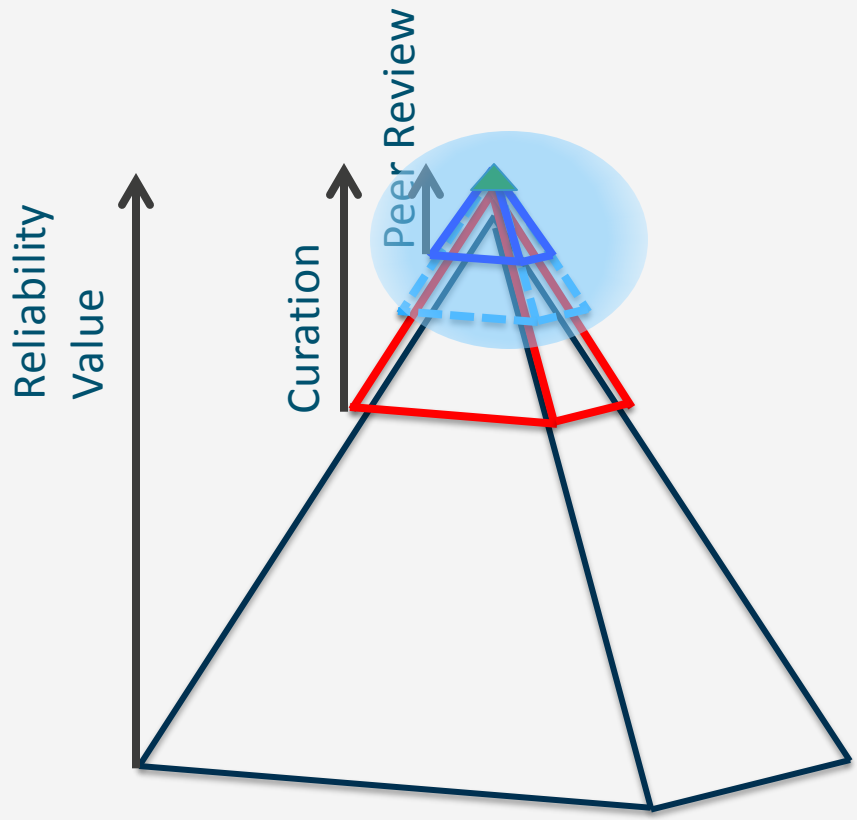
Quality Open Science: how to make it work?



Distributed responsibilities:

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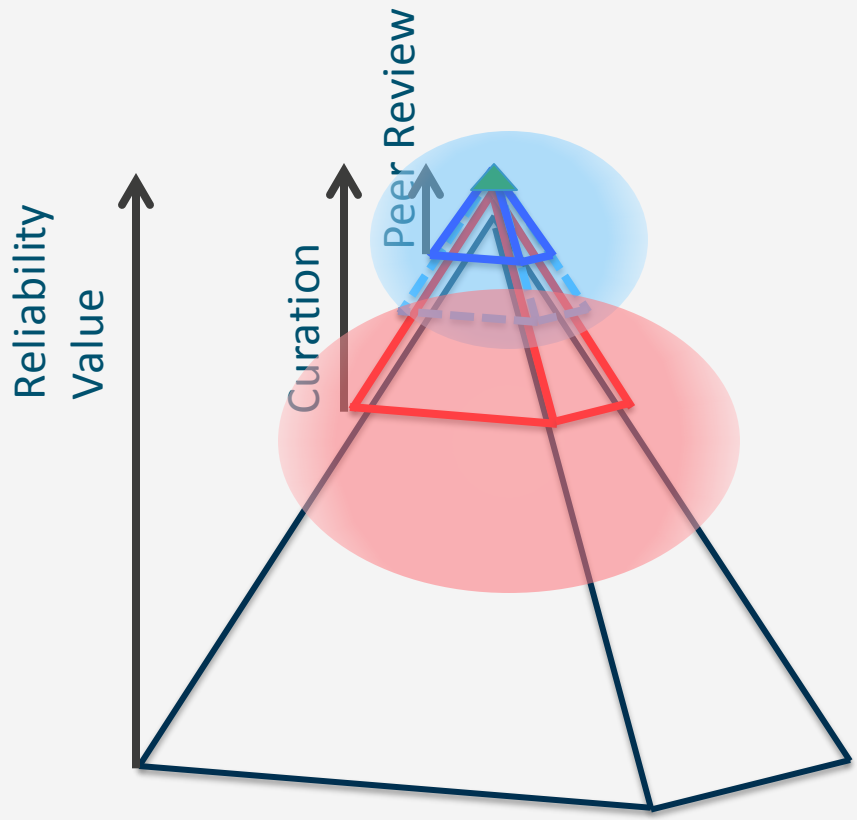

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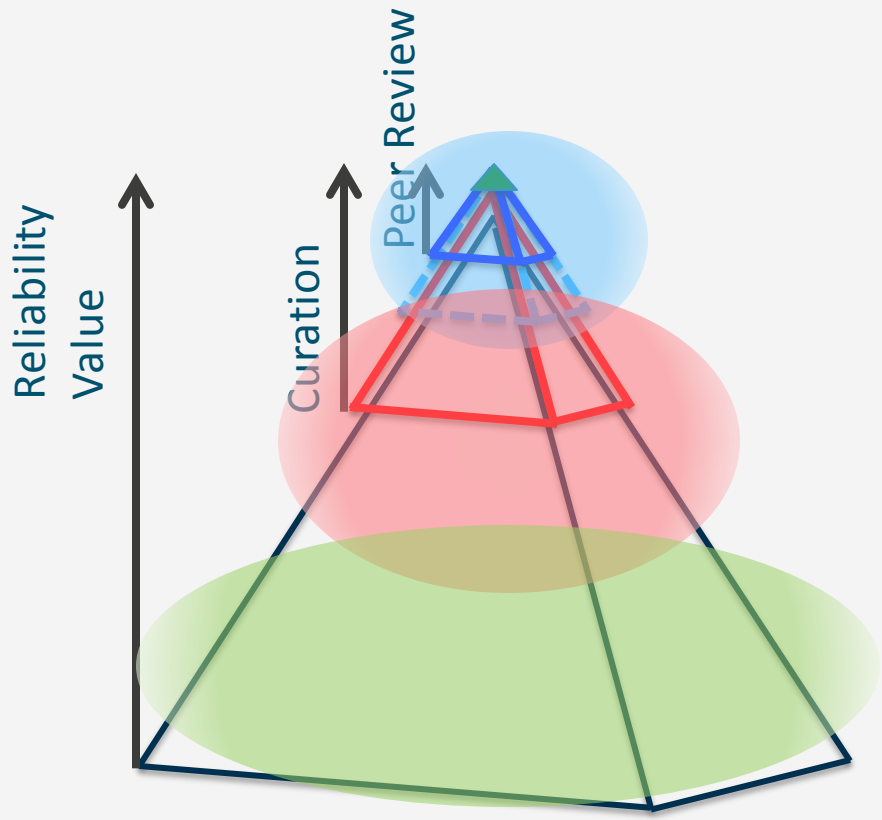

Distributed responsibilities:

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Council of the European Union

Brussels, 27 May 2016
(OR. en)

9526/16

RECH 208
TELECOM 100

OUTCOME OF PROCEEDINGS

From:	General Secretariat of the Council
To:	Delegations
No. prev. doc.:	8791/16 RECH 133 TELECOM 74
Subject:	The transition towards an Open Science system - Council conclusions (adopted on 27/05/2016)

CALLS on the Commission, the Member States and the stakeholders to take the necessary actions needed for making open science a reality and to advocate the need for concerted actions in relevant national, EU, multilateral and international fora; CALLS on the

THANK YOU!

thomas.lemberger@embo.org