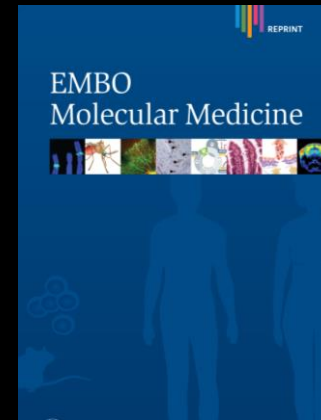
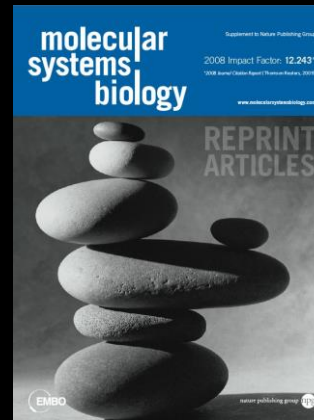
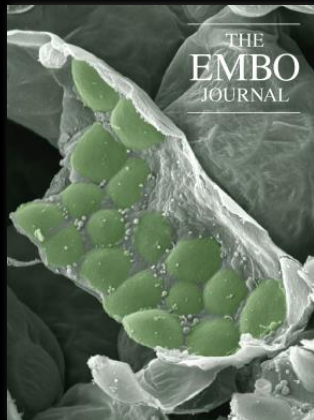
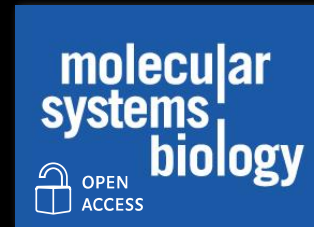


SOURCE
DATA

Thomas Lemberger, EMBO

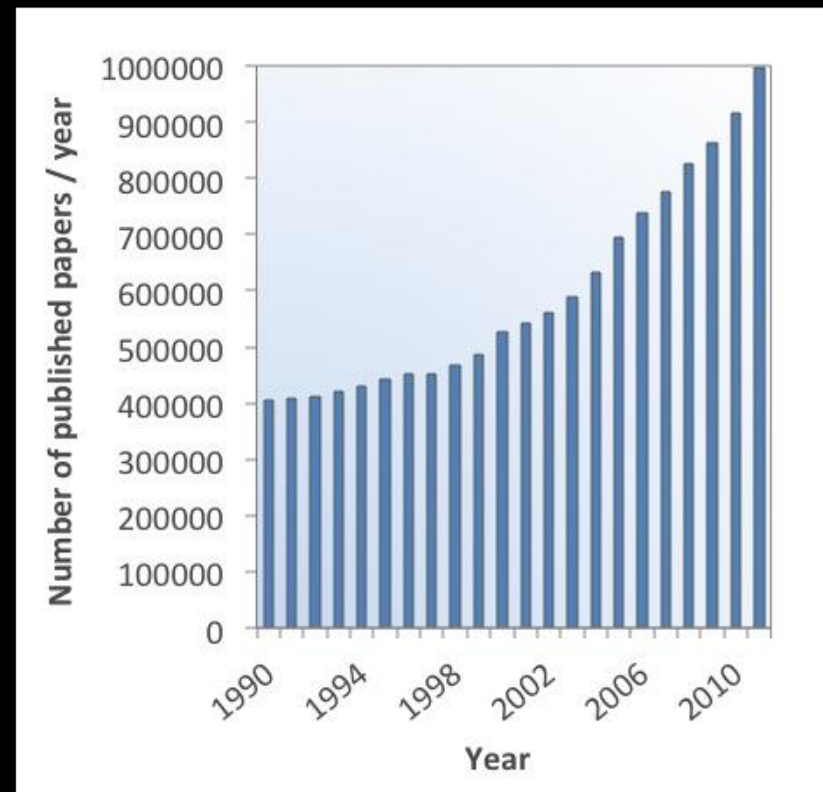


EMBOpress



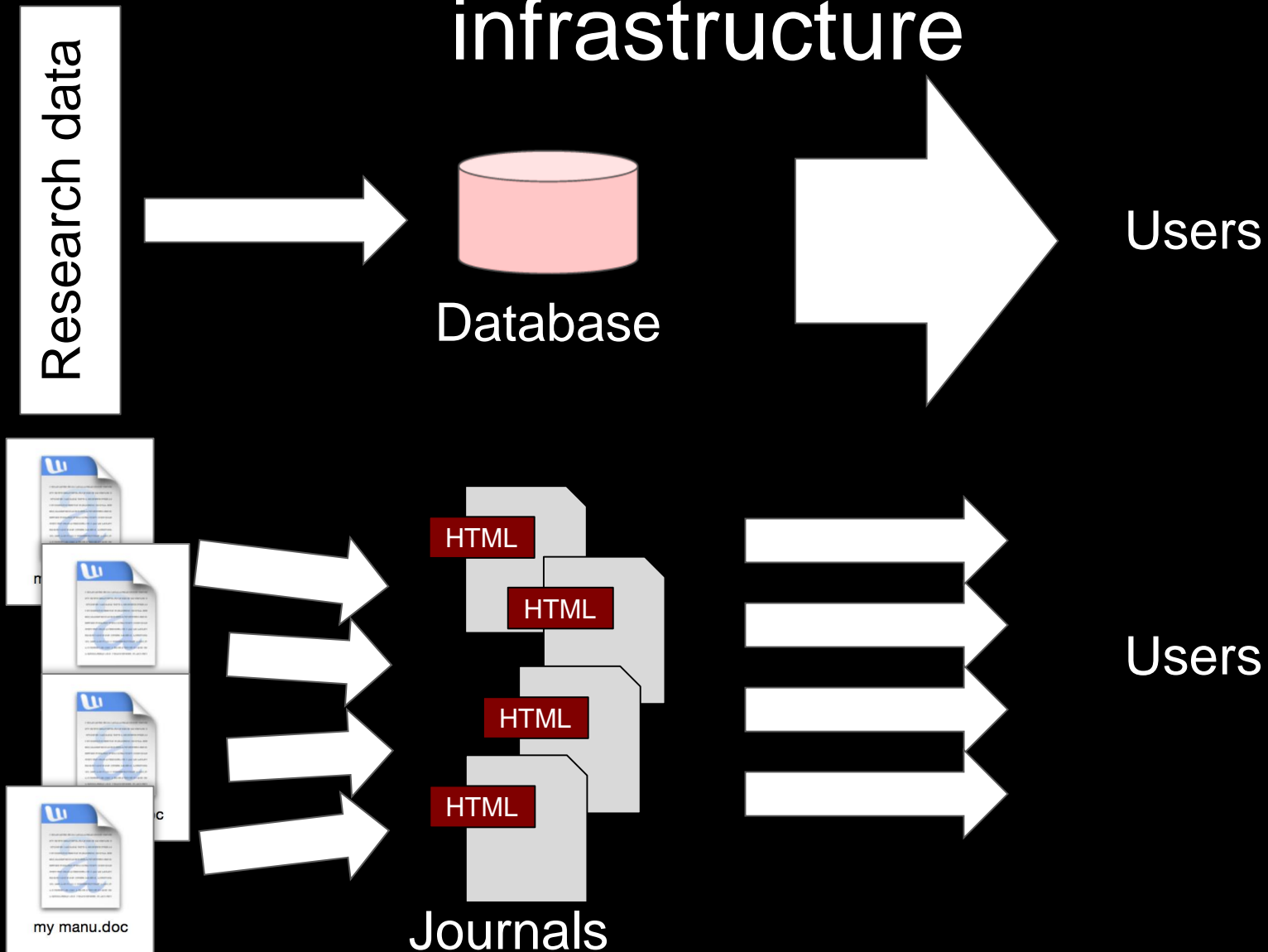
Scientific publishing

- Dominant channel for the dissemination of peer-reviewed data.
- Journals function as a proxy for quality in research assessment
- The rate of publishing keeps increasing.
- Papers are human-readable but poorly machine-readable.

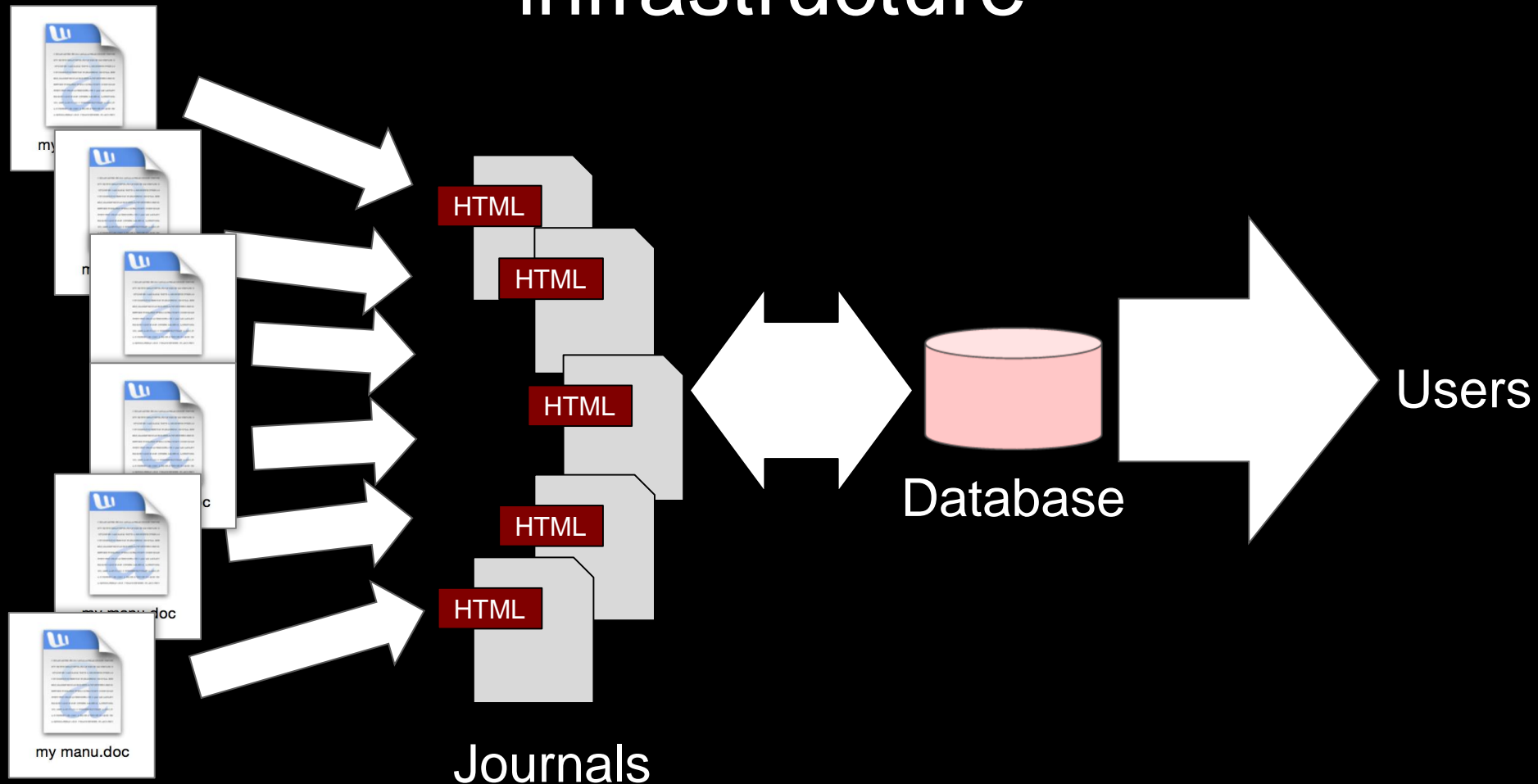


search

Publishing as a distributed infrastructure

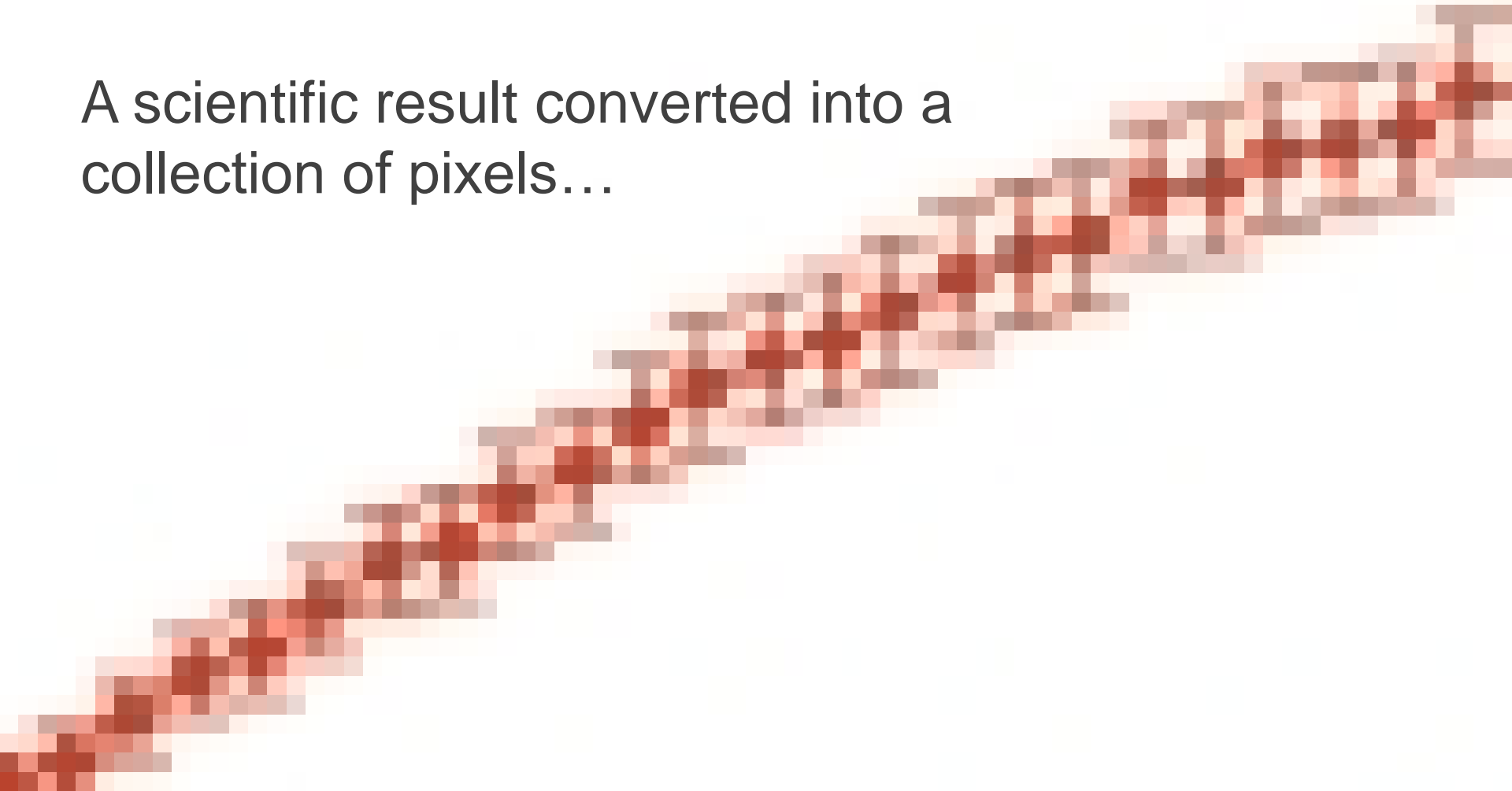


Publishing as a distributed infrastructure

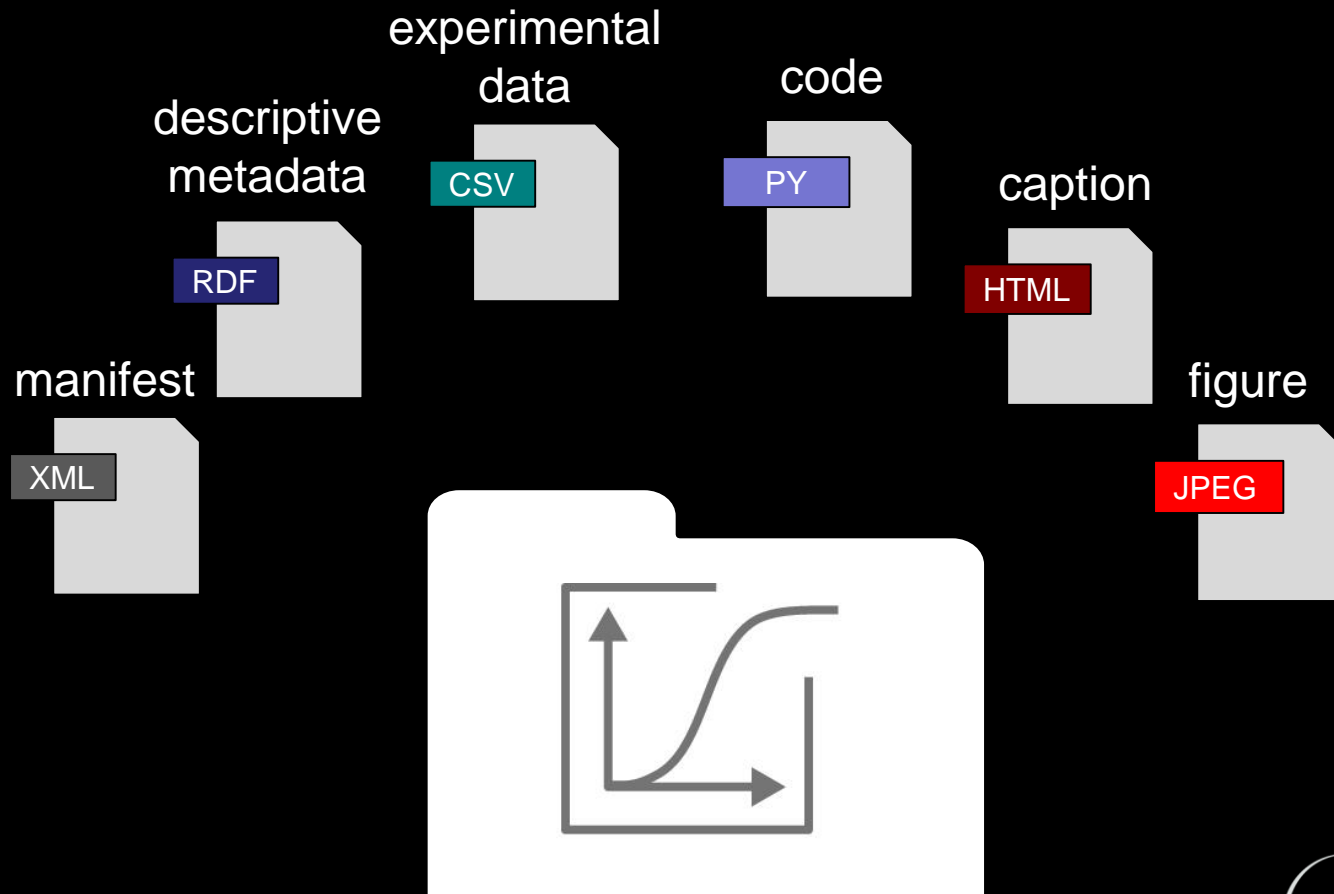


What is a figure?

A scientific result converted into a collection of pixels...

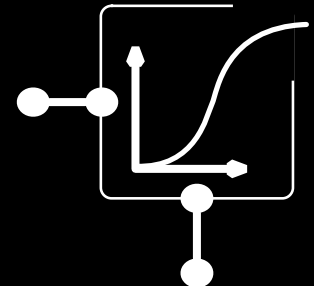
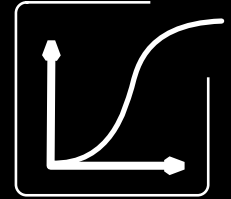


Figures as data packages



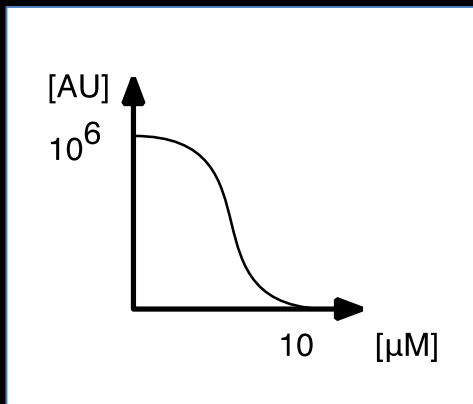
SourceData

- Issue 1: data availability for re-analysis
⇒ Source data behind the figures
- Issue 2: structure
⇒ Structured descriptive metadata
- Issue 3: discoverability
⇒ Data-oriented search



Data / Metadata

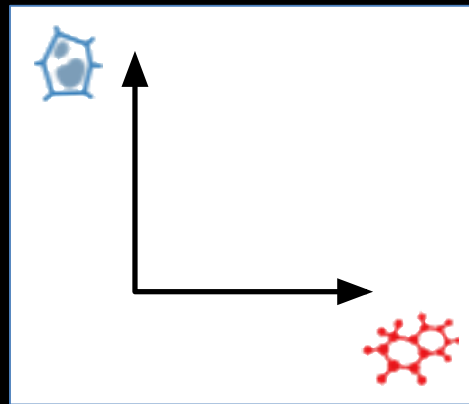
Measurement



Data

+

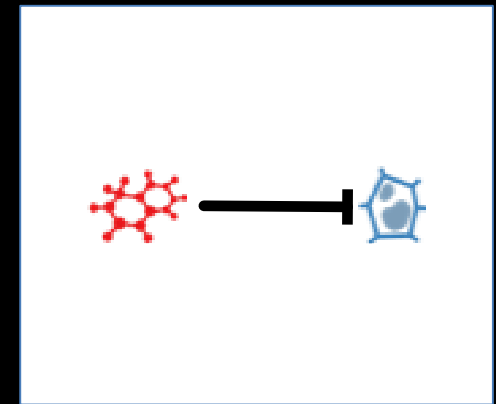
Design



Descriptive metadata

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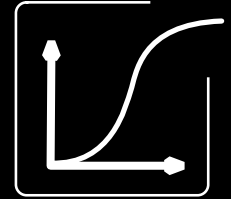
Interpretation



Statement

SourceData

- Issue 1: data availability for re-analysis
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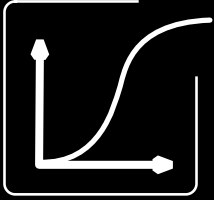


Figure source data

molecular
systems
biology

Figure 1

Systematic analysis of PDGF-stimulated Erk phosphorylation kinetics. (A) Immunoblots, representative of five or six independent experiments, used to quantify relative amounts of phosphorylated Erk (p-Erk1/2) and total Erk (t-Erk1). NIH 3T3 fibroblasts were modulated by retroviral induction of dominant-negative (S17N) or constitutively active (G12V) H-Ras expression or incubation with inhibitors of PI3K (100 μ M LY294002) or MEK (50 μ M PD098059). The respective controls are empty pBM-puro vector or 0.2% DMSO. Lysates were prepared from cells that were unstimulated or stimulated with PDGF-BB for 5, 15, 30, 60, or 120 min. (B-E) Quantification of Erk phosphorylation, normalized as described under Materials and methods, comparing either S17N Ras expression (B; $n=6$), PI3K inhibition (C; $n=5$), G12V Ras expression (D; $n=6$), or MEK inhibition (E; $n=5$) with their respective controls. Values are reported as mean \pm s.e.m., and comparisons to control in (B, C) are by Student's *t*-test: * $P<0.05$; ** $P<0.01$. Source data is available for this figure at www.nature.com/msb.



[Full figure and legend \(660K\)](#)

[Source data for figure 1BD \(6K\)](#)

[Source data for figure 1CE \(5K\)](#)

[Figures & Tables Index](#)

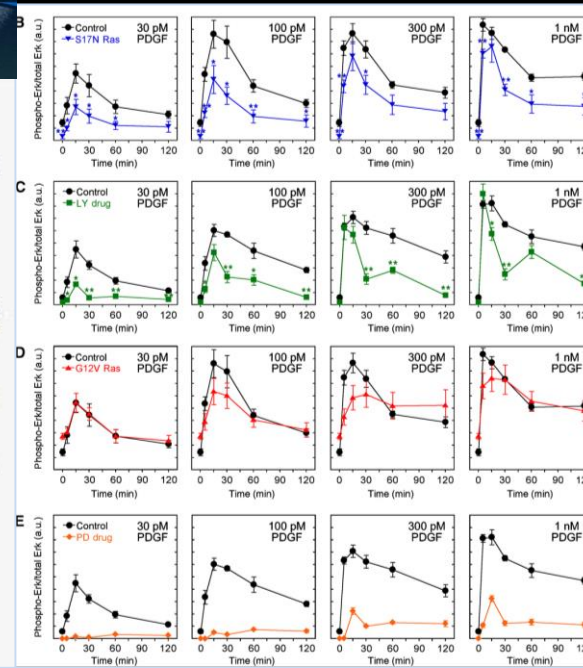


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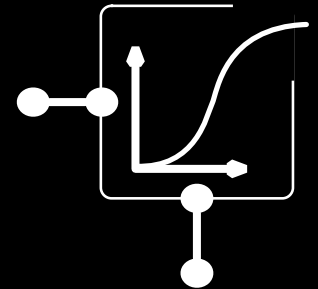
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		p-Erk/t-Erk, 30 pM PDGF, control vector, Expt. 1	p-Erk/t-Erk, 30 pM PDGF, control vector, Expt. 2	p-Erk/t-Erk, 30 pM PDGF, control vector, Expt. 3	p
2	Time (min)				v
3	0	0.194672394	0.201524091	0.339116171	
4	5	0.395173883	0.389974466	0.555355249	
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10					

Fig1b&d_raw.txt

Ready

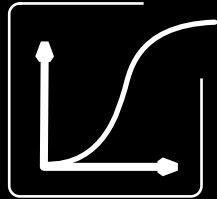
SourceData

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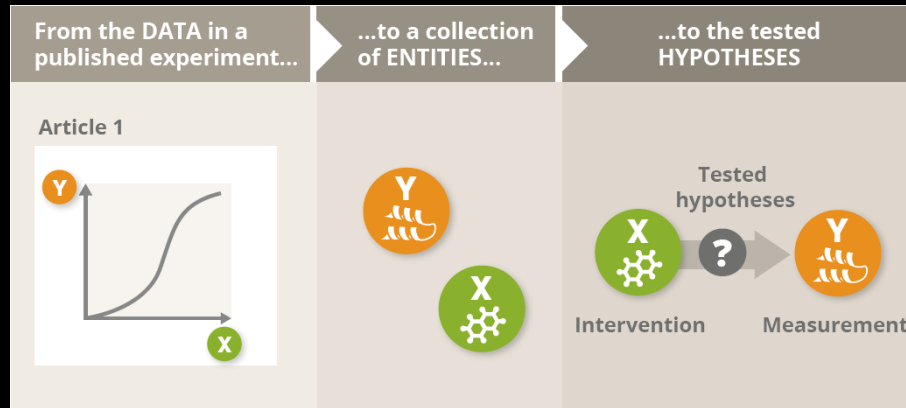


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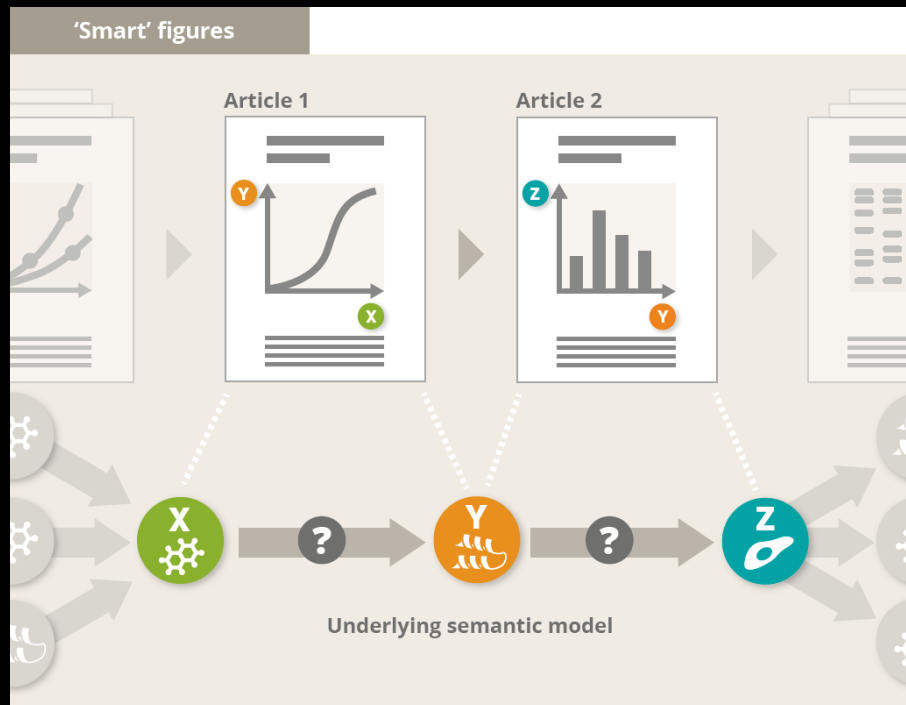
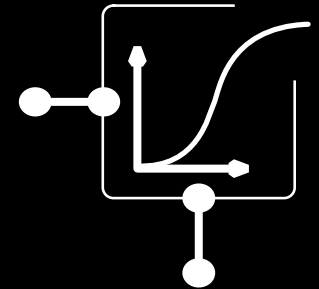
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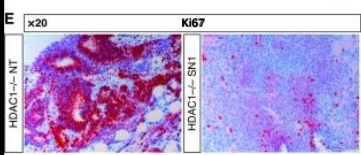
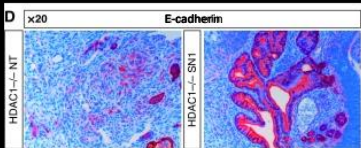
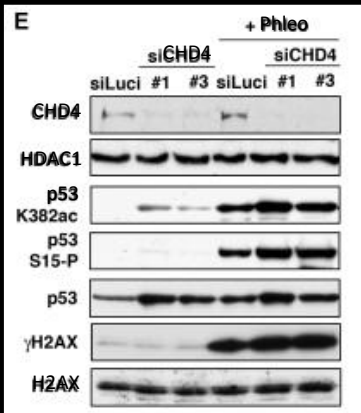
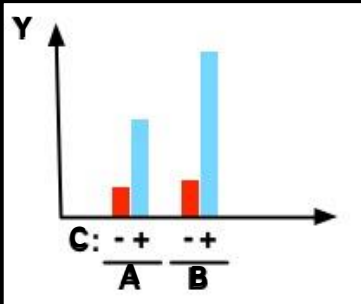
search



metadata

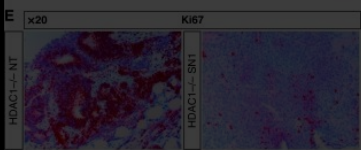
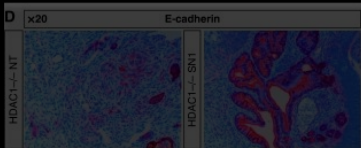
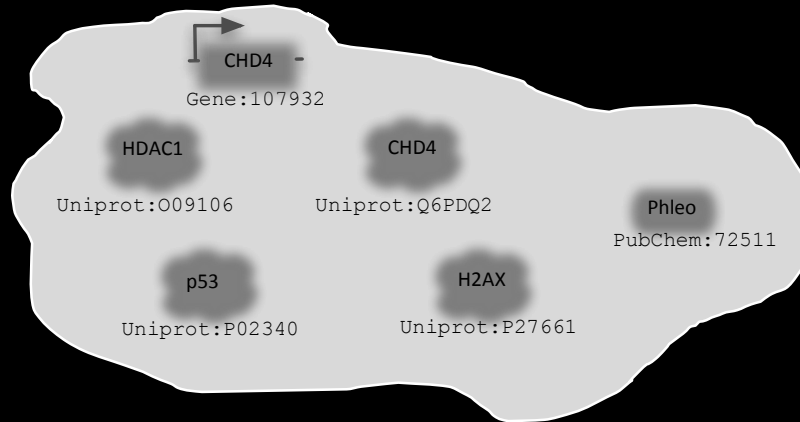
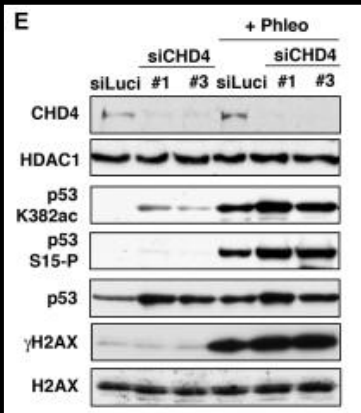
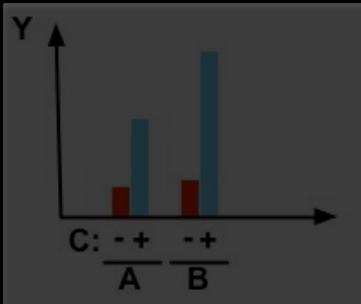
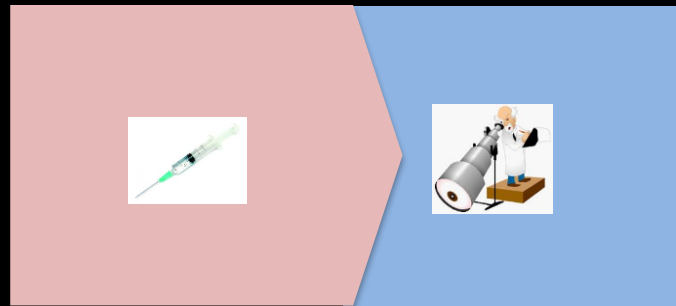


Descriptive metadata I



Descriptive metadata II

'intervention' 'observation'

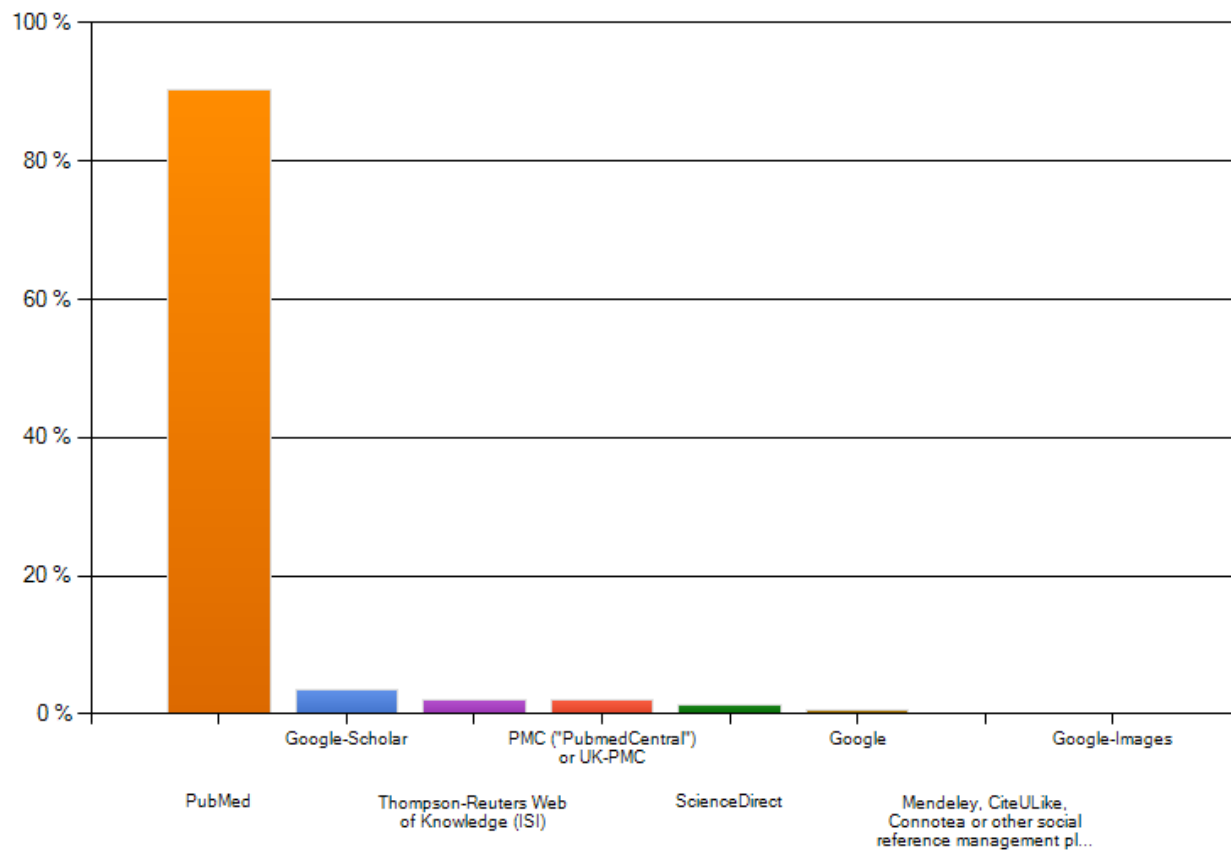


SourceData

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To which one of the following search platforms do you go first when looking for a specific paper?



How frequently did the following issues negatively affect your ability to find relevant scientific literature?

	Ambiguous biological terms	Lack of specificity	Lack of sensitivity	Suboptimal presentation	Ambiguous author names	No full text search	Complex queries difficult
Frequent	58	101	47	45	50	65	90
Rare	82	40	91	93	90	66	51

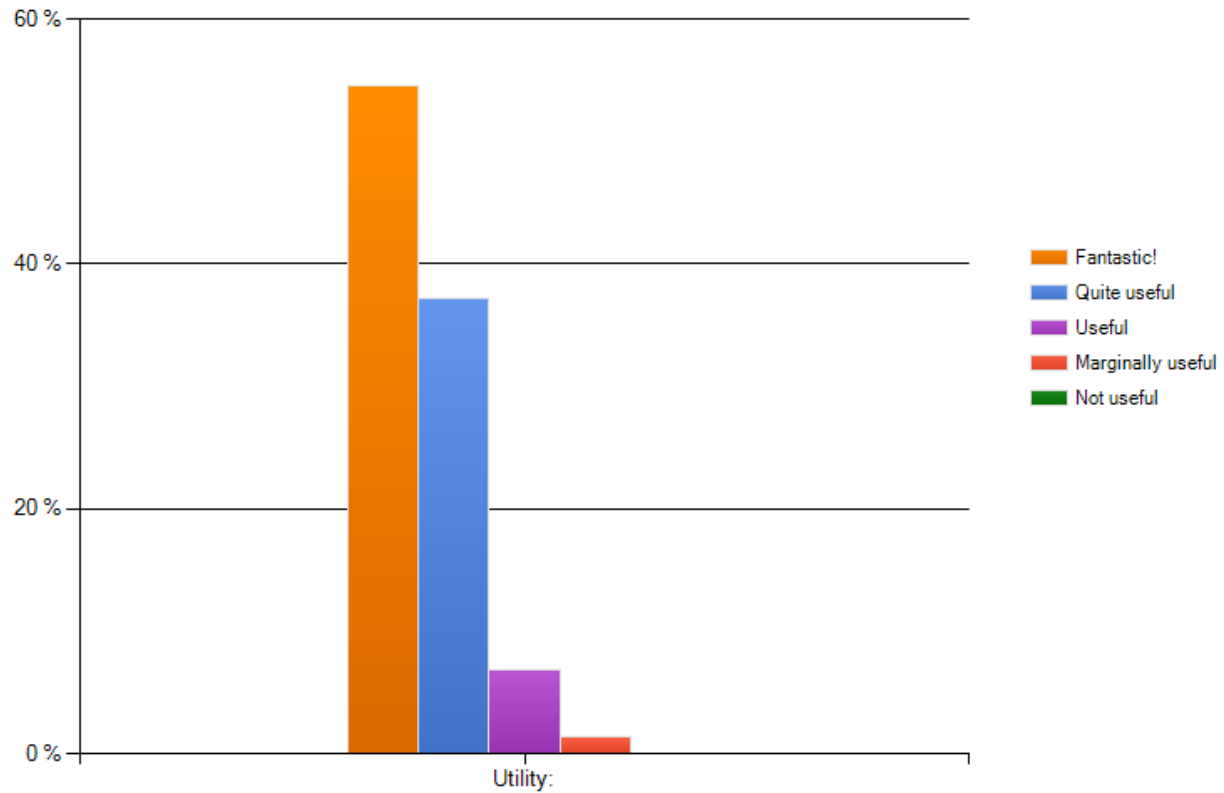
Using PubMed only, how much time (in minutes, real time or estimated) would you need to solve the following search 'exercises':

“Did anybody publish an experiment involving the siRNA-mediated knock down of gene X [X=some gene you do NOT know well]?” 25 min

“Find five substrates of the cyclin-dependent kinase CDK1 in mammalian cells?” 30 min

“Find more than three papers that include a time-course of p53 activation upon DNA damage” 45 min

Suppose you are planning an experiment (for example: measuring the expression of a given gene in a cell line treated with some drug). How useful would it be to have a search engine that finds similar published experiments?






Data-oriented search


A screenshot of a search interface. At the top is a search bar with a magnifying glass icon on the right. Below it is a dropdown menu with a close button (X) in the top right corner. The dropdown contains three items: 'Intervention' (highlighted with a red border), 'Assayed' (highlighted with a blue border), 'Other components', and 'Assay'. A search button with a magnifying glass icon is located at the bottom right of the dropdown menu.

search




search ▼ 

×

Intervention  Assayed

Other components

Assay 

search ▼ 🔍

✕

[small molecule] 🧪➡ parkin

Other components

Assay

🔍

A screenshot of a search interface. At the top, there is a search bar with the text "search" and a dropdown arrow. To the right of the search bar is a blue button with a white magnifying glass icon. Below the search bar is a form with a close button (✕) in the top right corner. The form contains three input fields: the first is "[small molecule]" with a red border, the second is "parkin" with a blue border, and the third is "Assay". Between the first and second fields is a grey arrow with a flask icon. At the bottom right of the form is a blue button with a white magnifying glass icon, which is circled in red.

intervention:[small molecule] assayed:parkin



Mitochondrial processing peptidase regulates PINK1 processing, import and Parkin recruitment

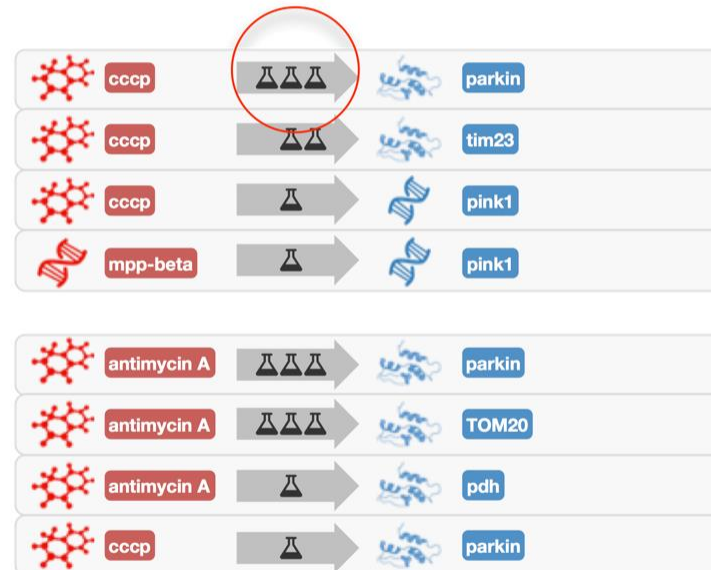
Greene AW1, Grenier K, Aguilera MA, Muise S, Farazifard R, Haque ME, McBride HM, Park DS, Fon EA

EMBO Rep. 2012 Apr;13(4):378-85. doi: 10.1038/embor.2012.14

Parkin and PINK1 function in a vesicular trafficking pathway regulating mitochondrial quality control

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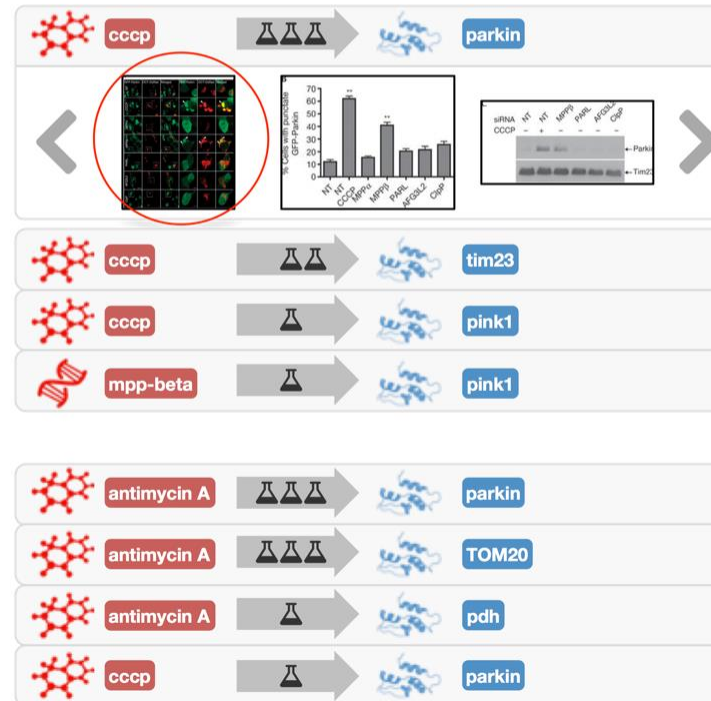
intervention:[small molecule] assayed:parkin



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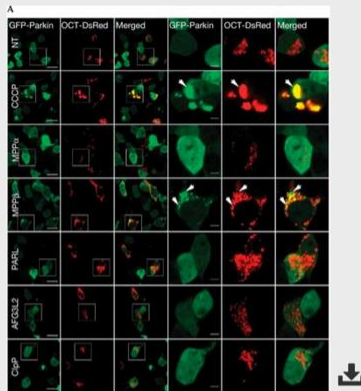
From: Figure 5. MPPβ knockdown induces Parkin recruitment and mitophagy

Interventions

- CCCP
- AFG3L2
- ClpP
- MPP alpha
- MPP beta
- PARL

Assayed

- OCT
- Parkin



« A B C D E »

Live confocal micrographs of siRNA-, GFP-Parkin- and OCT-DsRed-transfected HEK293T cells ±CCCP; Scale bars, 20 μm (low magnification) and 5 μm (high magnification).

Related data

- This paper only
- Global search

[See all \(12\)...](#)

FIP200 complex. (A) Immunoblot analysis of Atg proteins in the indicated MEFs. (B) m5-7 cells were cultured in regular medium containing 10 ng/ml Dox for 8 days, and then cultured in the absence of Dox for a further 2 days. (C,D) m5-7 cells were cultured in regular medium with or without 10 ng/ml Dox for 4 days, and then cultured in the presence of 50 μg/ml CHX for the indicated time periods (C). mRNA levels of the indicated genes were measured by quantitative PCR following the 4-day Dox treatment. Data represent mean±s.e. (**P*<0.05) (D). CHX, cycloheximide; Dox, doxycycline; MEFs, mouse embryonic fibroblasts; mRNA, messenger RNA; WT, wild-type.



From: **Figure 5. MPPβ knockdown induces Parkin recruitment and mitophagy**

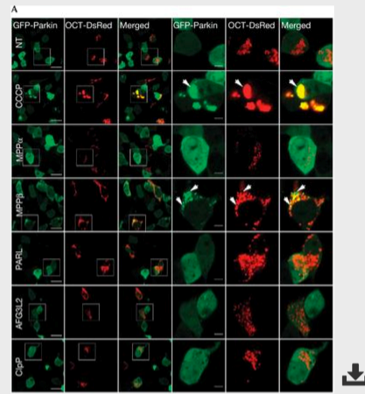
EMBO
reports

Interventions

- CCCp
- AFG3L2
- ClpP
- MPP alpha
- MPP beta
- PARL**

Assayed

- OCT
- Parkin



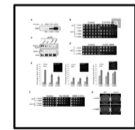
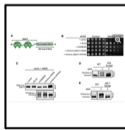
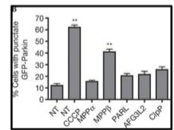
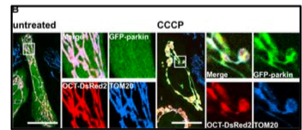
« **A** B C D E »

Live confocal micrographs of siRNA-, GFP-Parkin- and OCT-DsRed-transfected HEK293T cells ±CCCp; Scale bars, 20 μm (low magnification) and 5 μm (high magnification).

Related data

This paper only Global search

[See all \(12\)...](#)



CCCp
Parkin
OCT
TOM20

CCCp
AFG3L2
ClpP
Parkin
mitochondria

Parkin
PARL
Baf A

CCCp
OCT
Drp1



From: **Figure 5. MPPβ knockdown induces Parkin recruitment and mitophagy**

> PARL

Interventions

CCCp

AFG3L2

ClpP

MPP alpha

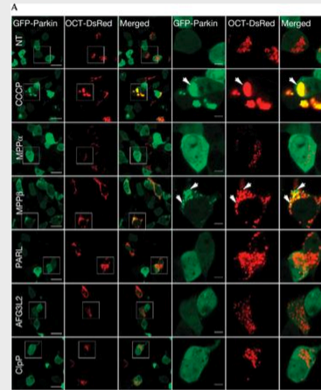
MPP beta

PARL

Assayed

OCT

Parkin



« A B C D E »

Live confocal micrographs of siRNA-, GFP-Parkin- and OCT-DsRed-transfected HEK293T cells ±CCCp; Scale bars, 20 μm (low magnification) and 5 μm (high magnification).

Upstream of
PARL [[Uniprot:XS002](#)]

PINK1 **PARL**

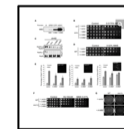
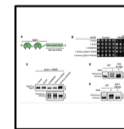
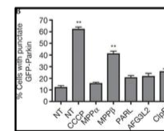
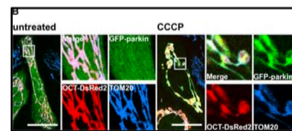
Mitochondrial processing peptidase regulates PINK1 processing, import and Parkin recruitment. Greene et al, *EMBO rep.* 2012



Related data

This paper only Global search

[See all \(12\)...](#)



CCCp
Parkin
OCT
TOM20

CCCp
AFG3L2
ClpP
Parkin
mitochondria

Parkin
PARL
Baf A

CCCp
OCT
Drp1

From: **Figure 5. MPPβ knockdown induces Parkin recruitment and mitophagy**

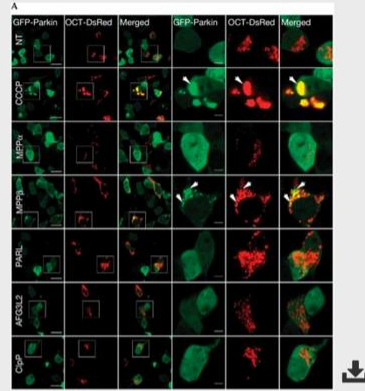
> parkin

Interventions

- CCCP
- AFG3L2
- ClpP
- MPP alpha
- MPP beta
- PARL

Assayed

- OCT
- Parkin



« **A** B C D E »

Live confocal micrographs of siRNA-, GFP-Parkin- and OCT-DsRed-transfected HEK293T cells ±CCCP; Scale bars, 20 μm (low magnification) and 5 μm (high magnification).



Downstream of Parkin [[Uniprot:O60260](#)]

Parkin **Alpha-synuclein**

Ubiquitination of a new form of alpha-synuclein by parkin from human brain: implications for Parkinson's disease. Shimmer et al, *Science* 2001

Parkin **Pael-R**

An unfolded putative transmembrane polypeptide, which can lead to endoplasmic reticulum stress, is a substrate of Parkin. Imani et al, *Cell* 2001

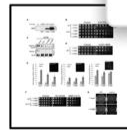
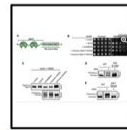
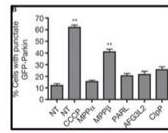
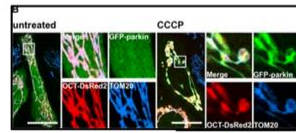
Parkin **Human**

Mutations in the parkin gene cause autosomal recessive juvenile parkinsonism. Kitada et al, *Nature J.* 1998

Related data

This paper only Global search

See all (12)...



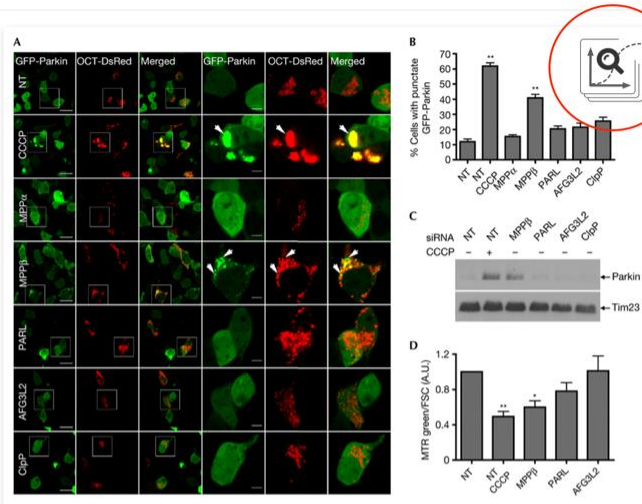
CCCP **Parkin** **OCT** **TOM20**

CCCP **AFG3L2** **ClpP** **Parkin** **mitochondria**

Parkin **PARL** **Baf A**

CCCP **OCT** **Drp1**

See all...



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Figure 5.

MPPβ knockdown induces Parkin recruitment and mitophagy. **(A)** Live confocal micrographs of siRNA-, GFP-Parkin- and OCT-DsRed-transfected HEK293T cells ±CCCP; Scale bars, 20 μm (low magnification) and 5 μm (high magnification). **(B)** Percentage of transfected cells displaying a punctate mitochondrial pattern of GFP-Parkin distribution, $n=3$; * $P<0.05$, ** $P<0.01$ compared with NT siRNA. **(C)** Immunoblots of endogenous Parkin in mitochondrial fractions from siRNA-transfected cells ±CCCP. **(D)** Mitochondrial mass measured by flow cytometry of MTR Green fluorescence in siRNA-transfected cells treated ±CCCP for 24 h, $n=3$. A.U., arbitrary unit; CCCP, carbonyl cyanide m-chlorophenyl hydrazone; GFP, green fluorescent protein; MPP, mitochondrial processing peptidase; MTR, MitoTracker; NT, non-targeting; PARL, presenilin-associated rhomboid-like protease; PINK1, phosphatase and tensin homologue-induced kinase 1; siRNA, short interfering RNA.

Finally, we examined whether Parkin recruitment induced by MPPβ knockdown could

View as SmartFigure

Article

EMBO
reports

- Article
- Abstract
- Introduction
- Results And Discussion
- Conclusions
- Methods
- Conflict of Interest
- Supplementary Information
- Acknowledgements
- References
- Figures & Data
- Transparent Process



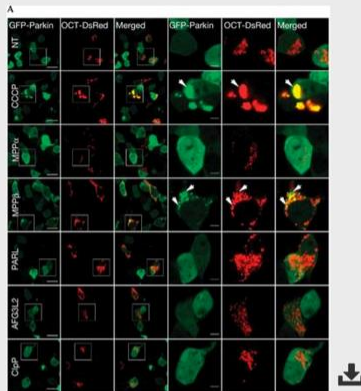
From: Figure 5. MPPβ knockdown induces Parkin recruitment and mitophagy

Interventions

- CCCP
- AFG3L2
- ClpP
- MPP alpha
- MPP beta
- PARL

Assayed

- OCT
- Parkin



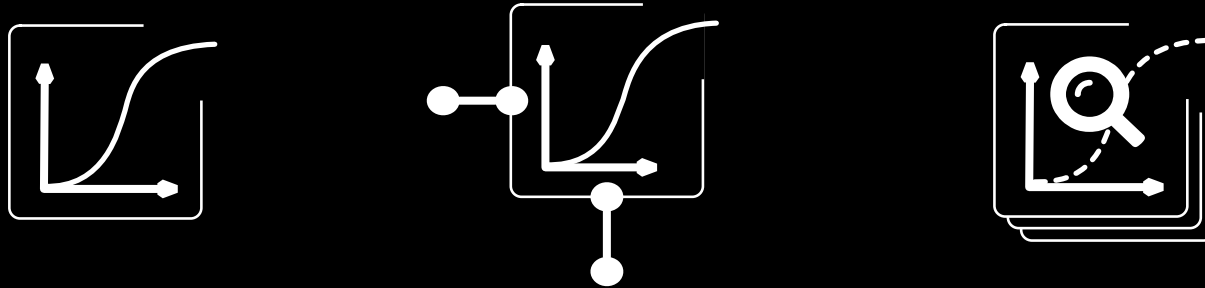
« A B C D E »

Live confocal micrographs of siRNA-, GFP-Parkin- and OCT-DsRed-transfected HEK293T cells ±CCCP; Scale bars, 20 μm (low magnification) and 5 μm (high magnification).

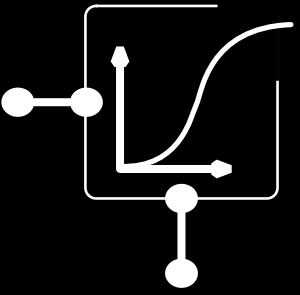
Related data This paper only Global search [See all \(12\)...](#)

FIP200 complex. (A) Immunoblot analysis of Atg proteins in the indicated MEFs. (B) m5-7 cells were cultured in regular medium containing 10 ng/ml Dox for 8 days, and then cultured in the absence of Dox for a further 2 days. (C,D) m5-7 cells were cultured in regular medium with or without 10 ng/ml Dox for 4 days, and then cultured in the presence of 50 μg/ml CHX for the indicated time periods (C). mRNA levels of the indicated genes were measured by quantitative PCR following the 4-day Dox treatment. Data represent mean±s.e. (**P*<0.05) (D). CHX, cycloheximide; Dox, doxycycline; MEFs, mouse embryonic fibroblasts; mRNA, messenger RNA; WT, wild-type.

SourceData

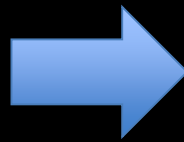


- Provide tools adapted to the workflow of researchers and of publishers
- Couple data availability to increased visibility of the papers
- Current scope: hypothesis-driven research in cell & molecular biology

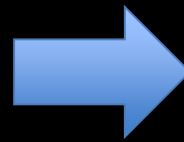


Towards integrating biocuration into the publishing workflow

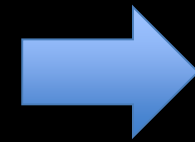
Pre-
acceptance
stage



Tools for
Data editor



Authors'
approval



Publish



EMBOpress

Team



Sara El-Gebali



Nancy George



Thomas Lemberger

Robert Bosch **Stiftung**

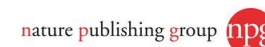
OUR PARTNERS



WILEY



Swiss Institute of
Bioinformatics



Robin Liechti



Lou Götz



Isaac Crespo

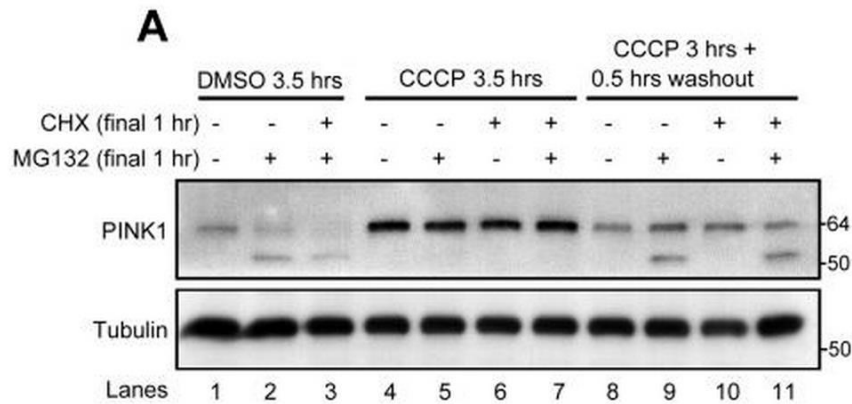


Ioannis Xenarios



Tagging & 2D annotation

Figure 2-A



A) HeLa cells stably expressing YFP-Parkin were treated with DMSO for 3.5 h, 2 μ M CCCP for 3.5 h, or CCCP for followed by washout of CCCP for 0.5 h in the absence of serum. 50 μ M MG132 and/or 100 μ M cyclohexamide were added for the last 1 h of treatment. Whole-cell lysates (WCL) run on SDS gels and immunoblotted for endogenous PINK1 and tubulin.

Click on a tag and hold the ALT key to confirm / delete all tags or suggestions of the same text and type.

perform on all tag suggestions of this panel:

confirm delete

confirm delete

delete p

undo redo

Type/Role Tag

CCCP

Intervention Target [I]

Assayed Component [A]

Normalizing Component [N]

Reporter Component [R]

Experimental Variable [E]

Biological Component [B]

small molecule [m]

small molecule. intervention target.

gene [g]

protein [p]

subcellular location [s]

cell type [c]

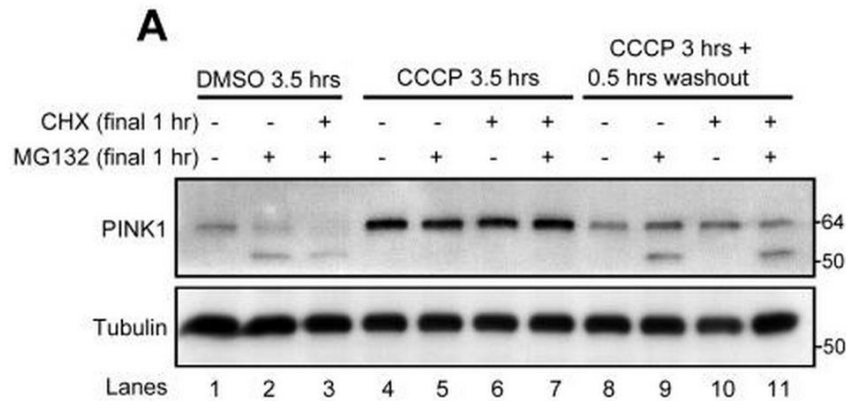
tissue [t]

organism [o]

undefined [u]

Tagging & 2D annotation

Figure 2-A



A) HeLa cells stably expressing YFP-Parkin were treated with DMSO for 3.5 h, 2 μ M CCCP for 3 h followed by washout of CCCP for 0.5 h in the absence of serum. 50 μ M MG132 and/or CHX were added for the last 1 h of treatment. Whole-cell lysates (WCL) run on SDS gels and immunoblotted for PINK1 and tubulin.

Click on a tag and hold the ALT key to confirm / delete all tags or suggestions of the same text and type.

perform on all tag suggestions of this

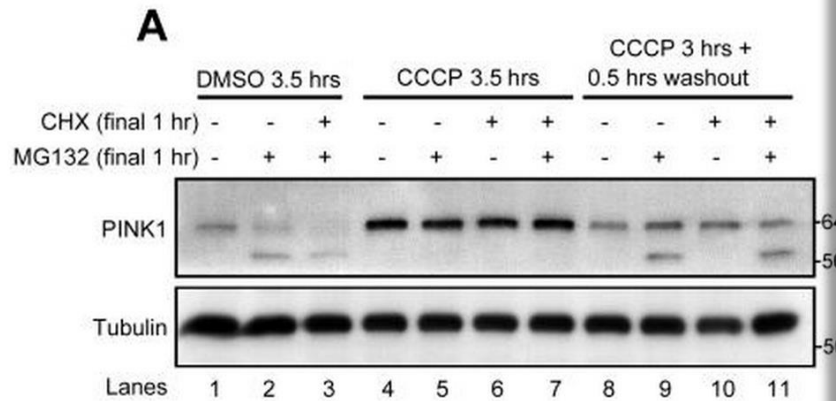
[confirm](#) [delete](#)

List
Condensed
Summary
new tag

Tag	External ID	Taxon
<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
Figure 2-A		
CCCP		<input type="checkbox"/> <input type="checkbox"/>
CCCP		<input type="checkbox"/> <input type="checkbox"/>
CCCP		<input type="checkbox"/> <input type="checkbox"/>
cyclohexamide		<input type="checkbox"/> <input type="checkbox"/>
MG132		<input type="checkbox"/> <input type="checkbox"/>
PINK1		Homo sapiens <input checked="" type="checkbox"/> <input type="checkbox"/>
tubulin		Homo sapiens <input checked="" type="checkbox"/> <input type="checkbox"/>
DMSO		<input type="checkbox"/> <input type="checkbox"/>
Parkin		Homo sapiens <input checked="" type="checkbox"/> <input type="checkbox"/>
YFP		Homo sapiens <input checked="" type="checkbox"/> <input type="checkbox"/>
HeLa cells		Homo sapiens <input checked="" type="checkbox"/> <input type="checkbox"/>

Visual feedback

Figure 2-A



A) **HeLa cells** stably expressing **YFP-Parkin** were treated with **DMSO** for 3.5 h, 2 μ g/ml **CHX** for 3 h followed by washout of **CCCP** for 0.5 h in the absence of serum. 50 μ M **MG132** and **cyclohexamide** were added for the last 1 h of treatment. Whole-cell lysates (WCL) run on SDS gels and **PINK1** and **tubulin**.

Click on a tag and hold the ALT key to confirm / delete all tags or suggestions of the same text and type.

perform on all tag suggestions of

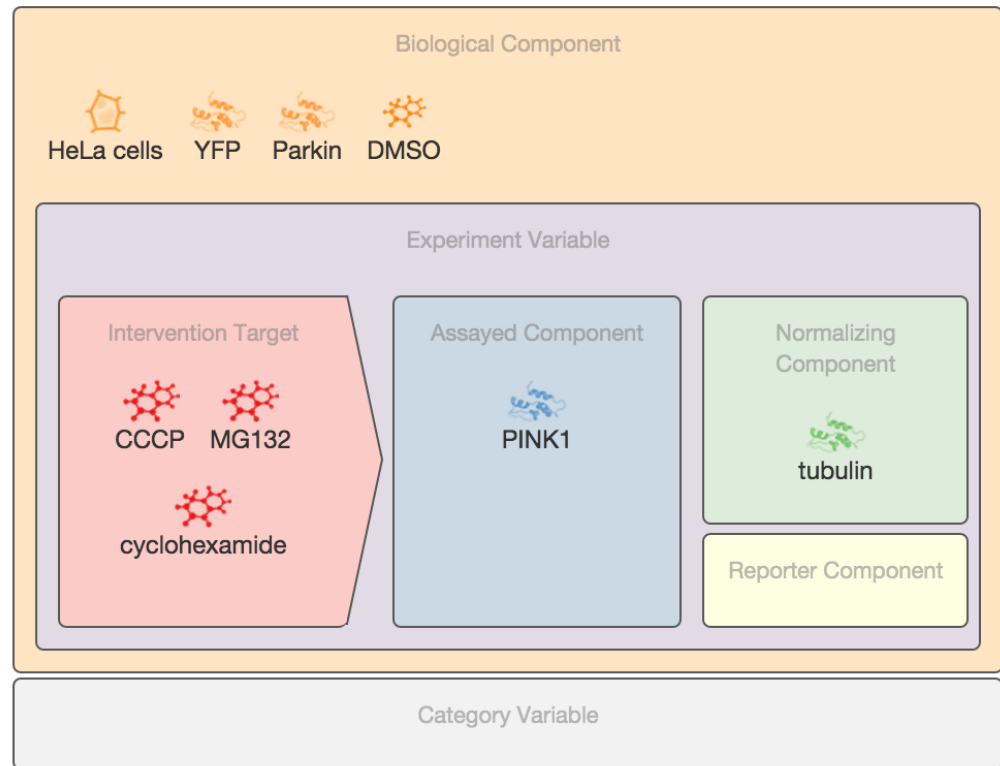
confirm **delete**

List

Condensed

Summary

new tag



Links to external databases

SIB EMBO Robert Bosch Stiftung SourceData admin | about | Welcome Thomas logout

back to *tl-private* collection

EMBL-EBI Services Research Training About us

ChEBI

Search

Examples: [iron*](#), [InChI=1S/H2O/h1H2](#), [water](#) [Advanced](#)

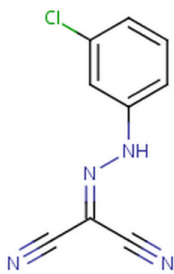
Home Advanced Search Browse Documentation Download Tools About ChEBI

Contact us Preferences Submit

ChEBI > Main

CHEBI:3259 - CCCP

Main ChEBI Ontology Automatic Xrefs



ChEBI Name	CCCP
ChEBI ID	CHEBI:3259
Stars	☆☆☆ This entity has been manually annotated by the ChEBI Team.
Supplier Information	ZINC00161387 , eMolecules:489139
	Download Molfile

- [Find compounds which contain this structure](#)
- [Find compounds which resemble this structure](#)
- [Take structure to the Advanced Search](#)

Type/Role Tag

CCCP cancel Save 0

Panel Figure 2-A

Type molecule

Role intervention

External IDs CHEBI:3259 [i](#) [Q](#) set delete

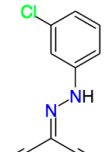
Search CHEBI CCCP Go

ChEBI results for 'CCCP'









(pick one or several entries)

Id	Name
<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> CHEBI:3259	CCCP i Q

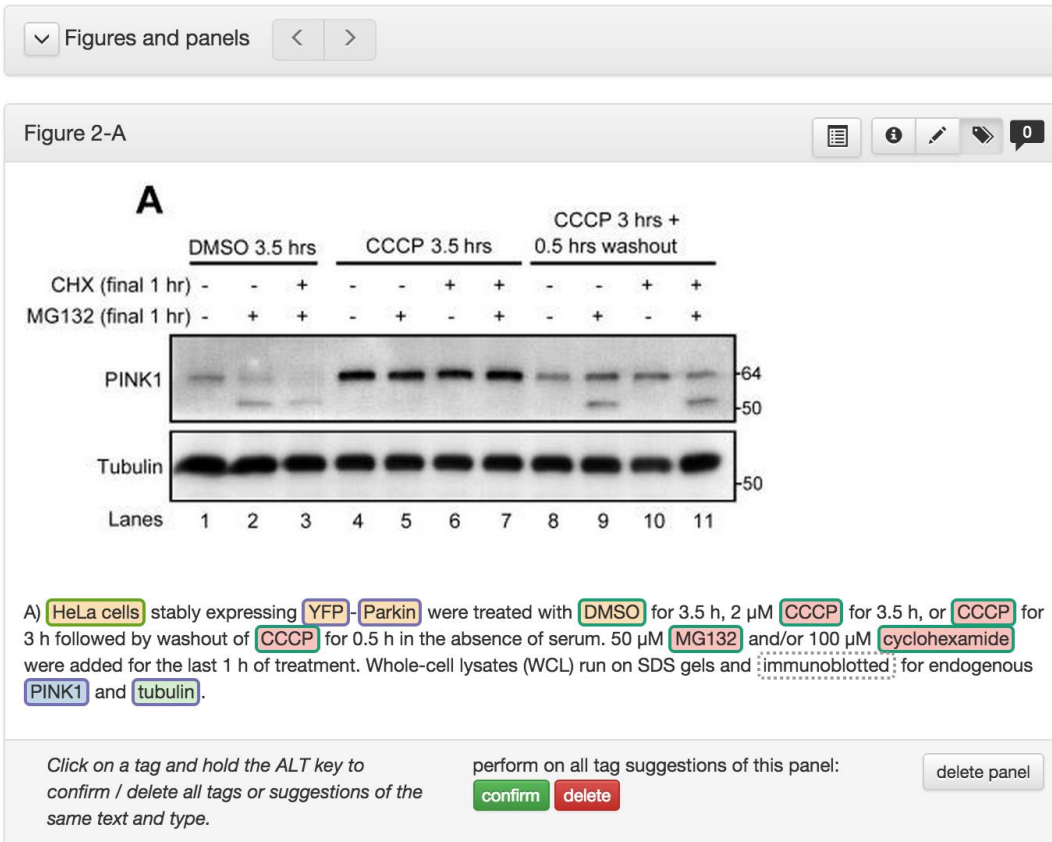
ID CHEBI:3259
Name CCCP
Synonyms CCCP, Carbonyl cyanide m-chlorophenyl hydrazone, (3-chlorophenyl)hydrazonomalononitrile, [(3-chlorophenyl)hydrazono]malononitrile, carbonyl cyanide-3-chlorophenylhydrazone, N'-(3-chlorophenyl)carbonohydrizonoyl dicyanide, [(3-chlorophenyl)hydrazono]propanedinitrile



SIB Swiss Institute of Bioinformatics Vital-IT Feedback

	ENTITY TYPES	EXTERNAL RESOURCES
	Simple molecules	CHEBI
	Genes	NCBI Gene
	Proteins	UniprotKB/Swiss-Prot
	Subcellular structures	Gene Ontology – cellular components
	Cell lines & types	Cellosaurus & Uberon
	Tissues	Uberon
	Organisms	NCBI Taxonomy
	Undefined	None

Normalized entities



Annotation status for Figure 2-A

with validated external id external id by default without external id

List Condensed Summary new tag

Tag	External ID	Taxon	(x)
CCCP	ChEBI:3259		(x3)
MG132	ChEBI:75142		(x2)
cyclohexamide	ChEBI:27641		
PINK1	Uniprot:Q9BXM7	Homo sapiens	
tubulin		Homo sapiens	
DMSO			
Parkin	Uniprot:O60260	Homo sapiens	
YFP			
HeLa cells	CL/CVCL:CVCL_0030	Homo sapiens	

EMBO source data

sourcedata.vital-it.ch/#/paper/967figure=6&panel=4

EMBOpress Robert Bosch Stiftung SourceData admin | about | Welcome Thomas logout

back to *tl-test-ed* collection

Hormone-induced mitochondrial fission is utilized by brown adipocytes as an amplification pathway for energy expenditure. delete paper export

Figures and panels

Figure 6-B edit comment

Western blot for total and phosphorylated Drp1 (Ser600) in BA treated with PKA inhibitor H89 and control. Porin is used as a loading control. Note that the increase in Ser600 phosphorylation with NE stimulation (50 min) is inhibited by H89. n = 3 per condition.

Click on a tag and hold the ALT key to confirm / delete all tags or suggestions of the same text and type. delete panel

undo redo fetching external information for tags

Annotation status for Figure 6-B

with validated external id external id by default without external id

List Condensed Summary new tag

Biological Component

BA PKA Ser600

Experiment Variable

Intervention Target

NE H89

Uniprot:Q00429

Drp1

Normalizing Component

Porin

Reporter Component

SIB Swiss Institute of Bioinformatics Vital-IT Feedback

We **DO NOT** (yet) annotate:

~~Schemes, drawings,
pathways, sequences~~

~~processes, attributes,
activities, properties such
as cell cycle progression,
apoptosis rate, metabolic
activity, temperature, fever,
phosphorylation levels~~

...

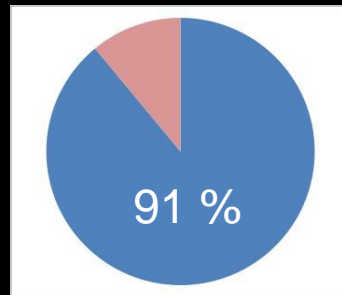
~~time, space, physical forces
the value of parameters
concentrations, amounts
specific genetic variants
disease state~~

Pervasive structures

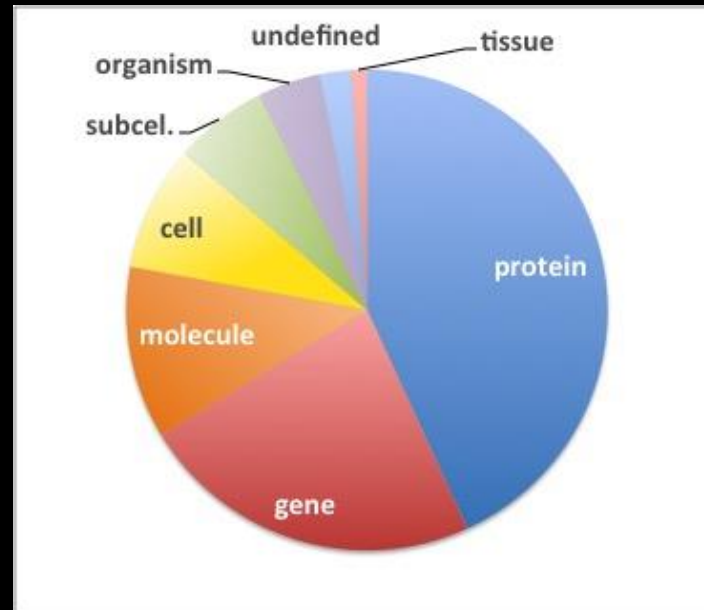
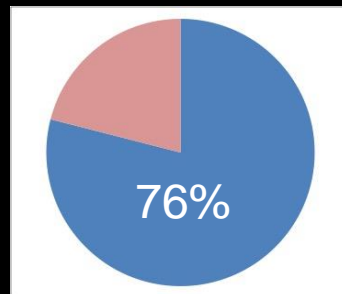
- Curation performed at the level of panels
- Focus on 'objects' (entities)
- When possible, represent experimentally tested (causal) hypotheses

Preliminary analysis of 561 figures (23855 tags, cell & mol biol 'autophagy'-related papers):

Fraction of figure with multiple panels



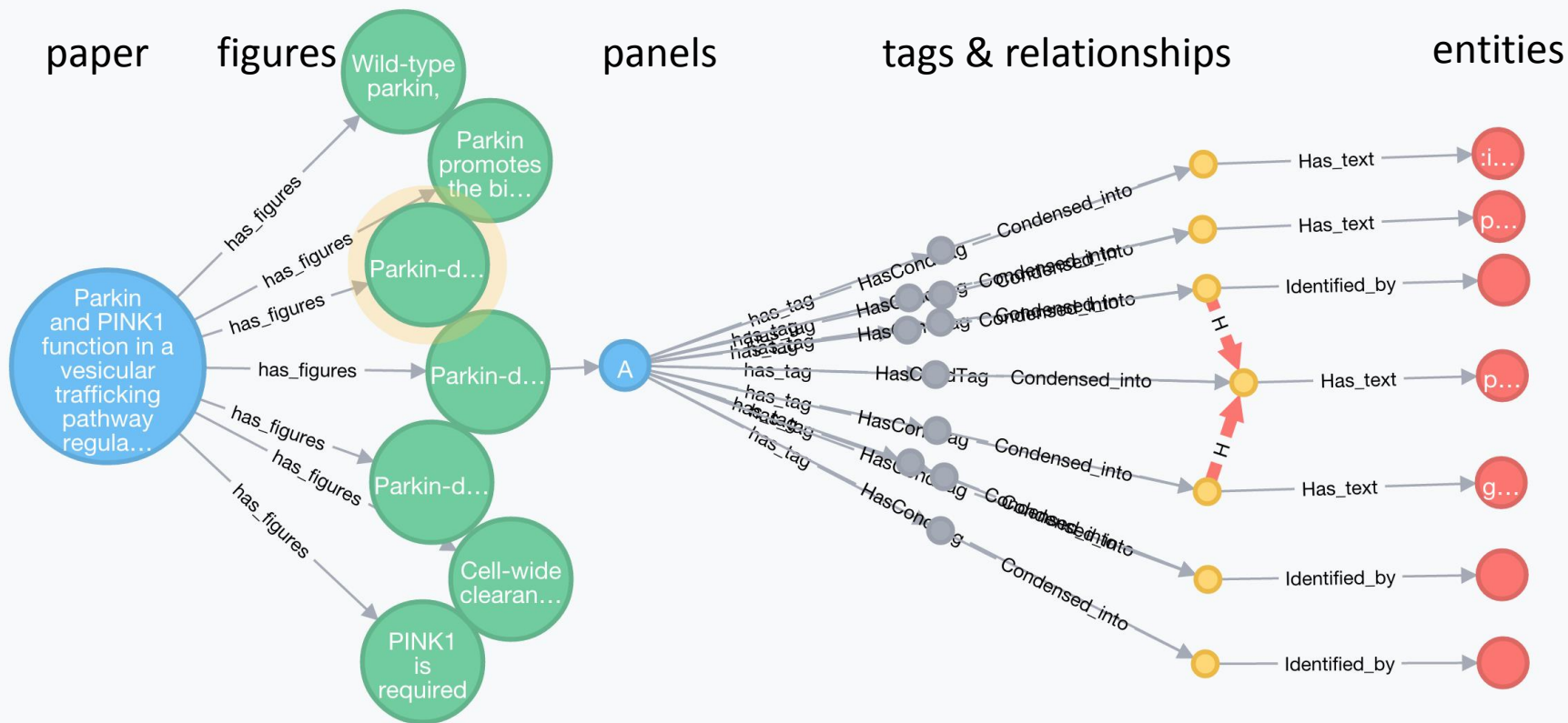
Fraction of panels with a 'causal hypothesis'



Distribution of entity types



Connect papers to defined entities





Connect figures via defined entities

Article

Coordinated regulation of autophagy by p38α MAPK through mAtg9 and p38IP

Jemma L Webber, Sharon A Tooze

Author Affiliations

DOI 10.1038/emboj.2009.321 | Published online 05.11.2009
The EMBO Journal (2010) 29, 27-40



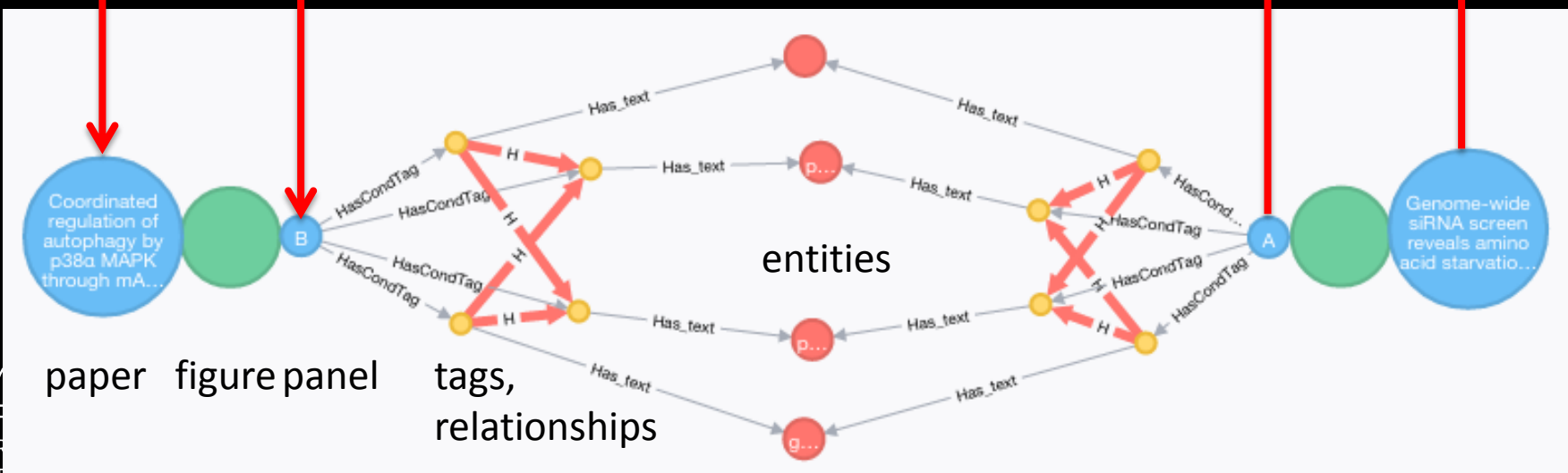
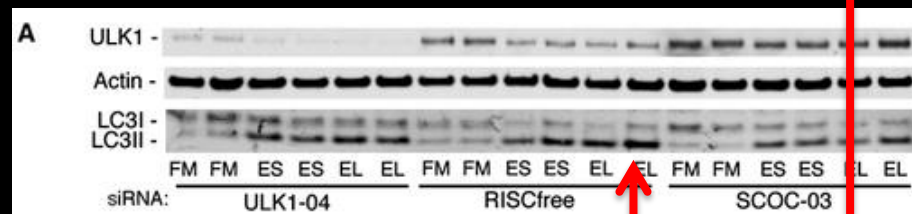
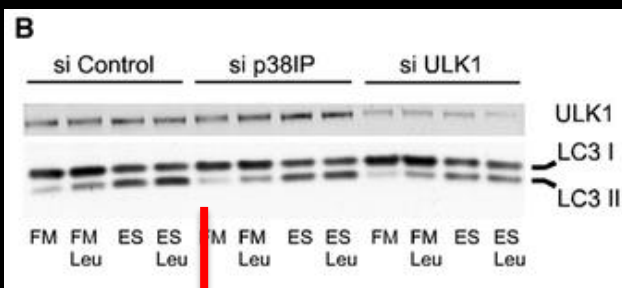
Article

Genome-wide siRNA screen reveals amino acid starvation-induced autophagy requires SCOC and WAC

Nicole C McKnight, Harold B J Jefferies, Endalkachew A Alemu, Rebecca E Saunders, Michael Howell, Terje Johansen, Sharon A Tooze

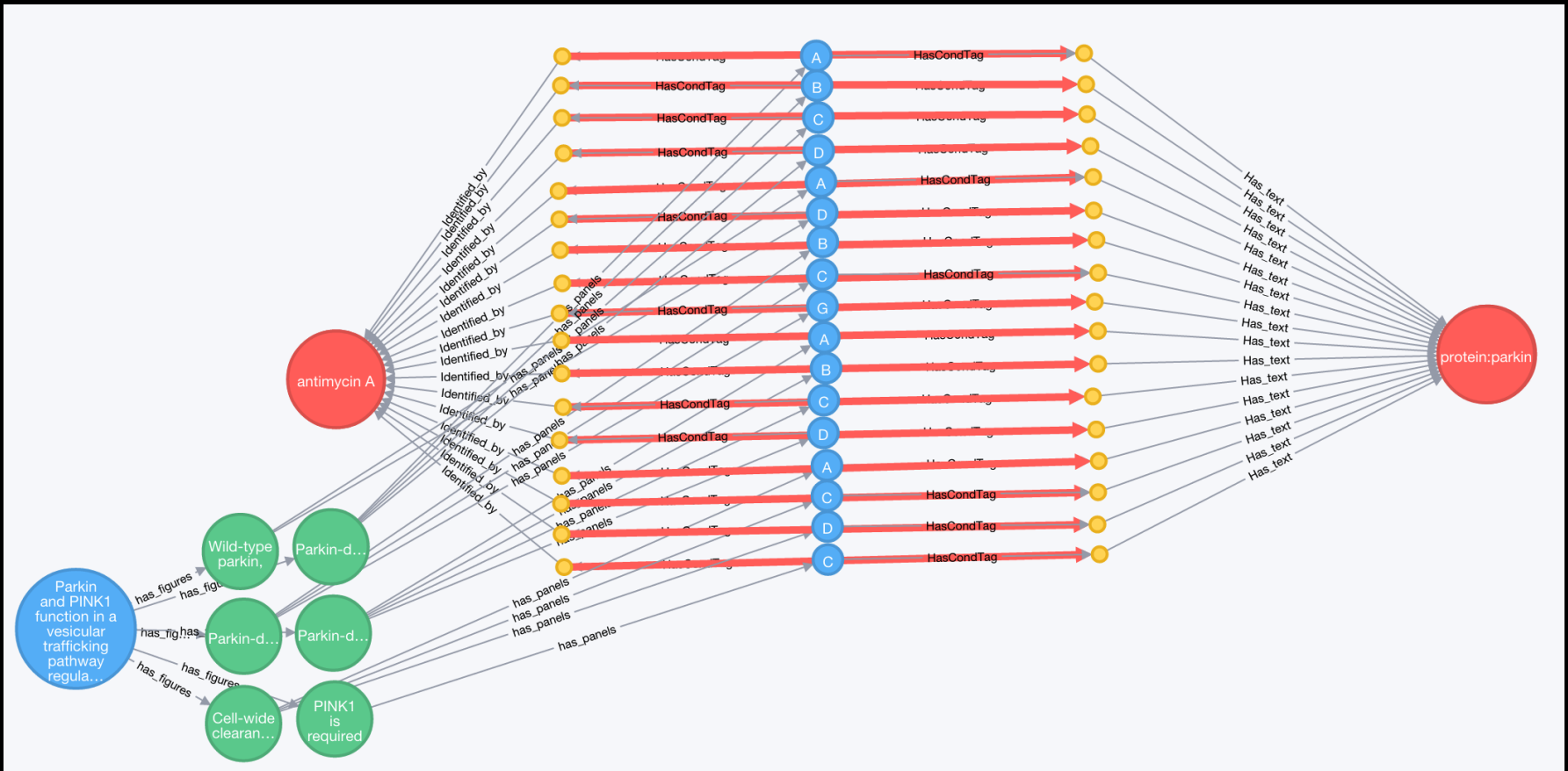
Author Affiliations

DOI 10.1038/emboj.2012.36 | Published online 21.02.2012
The EMBO Journal (2012) 31, 1931-1946



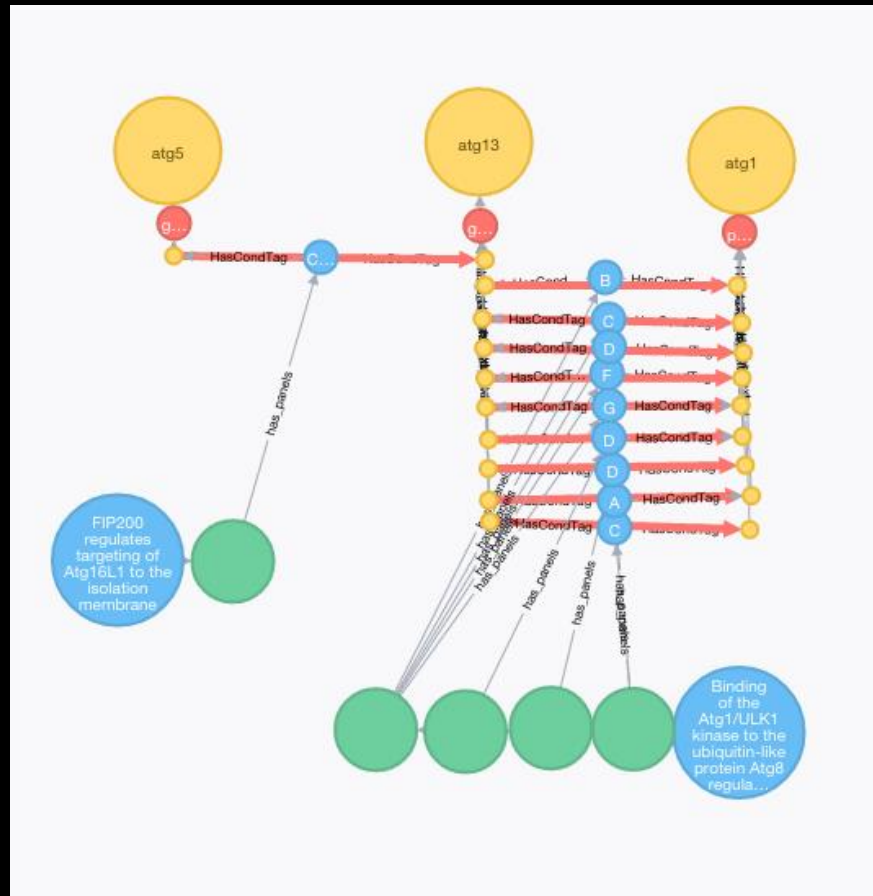
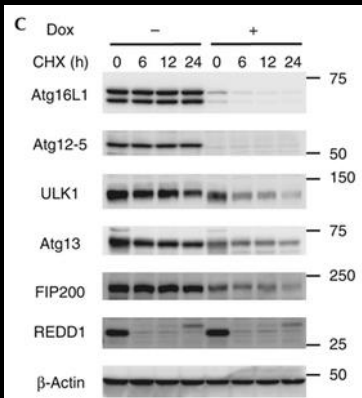


Intervention-Assay



⇒ Summarization with 'hypothesis profiles'

Data-oriented search



Article

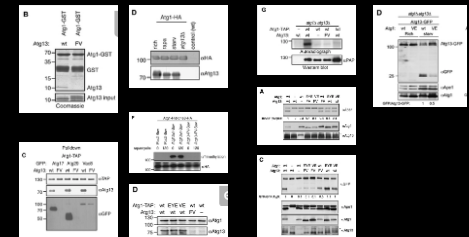
Transparent Process

Binding of the Atg1/ULK1 kinase to the ubiquitin-like protein Atg8 regulates autophagy

Claudine Kraft, Monika Kijanska, Eyal Kalie, Edyta Siergiejuk, Sung Sik Lee, Giuseppe Semplicio, Ingrid Stoffel, Andrea Brezovich, Mayanka Verma, Isabella Hansmann, Gustav Ammèrer, Kay Hofmann, Sharon Tooze, Matthias Peter

Author Affiliations

DOI 10.1038/emboj.2012.225 | Published online 10.08.2012
The EMBO Journal (2012) 31, 3691-3703



⇒ Use of directed relationships



Future App: 'smart figures'

Q

X

Intervention
Assayed

Q

Q

From: Figure 2. The Atg12–Atg5–Atg16L1 complex regulates the stability of the ULK1–Atg13–FIP200 complex.

Interventions

- DOX
- CHX
- Atg5

Fig. 2C

m5-7 cells were cultured in regular medium with or without 10 ng/ml Dox for 4 days, and then cultured in the presence of 50 µg/ml CHX for the indicated time periods (C). mRNA levels of the indicated genes were measured by quantitative PCR following the 4-day Dox treatment. Data represent mean±s.e. (*P<0.05)

Assayed

- Atg13
- Atg16L1
- Atg12-5
- ULK1
- FIP200
- REDD1

Downstream of Atg13 [Uniprot:UX098]

- **Atg1**

Binding of the Atg1/ULK1 kinase to the ubiquitin-like protein Atg8 regulates autophagy. Kraft et al, *EMBO J.* 2012
- **Dhhf**

Major histocompatibility complex class II-restricted presentation of a cytosolic antigen by autophagy. John et al, *Science* 2012
- **Mitochondria**

The role of Xrf in mitochondrial respiration. Jones et al, *Nature J.* 2024

[See all...](#)

Related data This paper only Global search [See all \(12\)...](#)

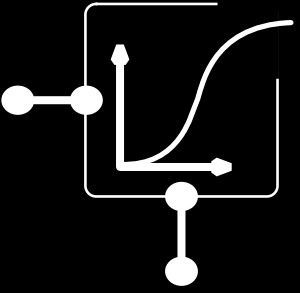
Atg5
ULK1
CHX
ULK1
ULK1

Crit
Atg5
ULK1
ULK1
ULK1

BafA
Atg5
LC3
Atg13
Atg13

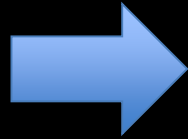
Atg5
Atg13
Xrf
Atg13

Atg5
Atg13
Xrf
Atg13

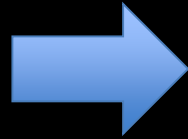


Towards integrating biocuration into the publishing workflow

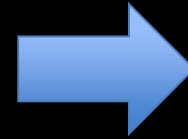
Pre-
acceptance
stage



Data editor



Authors'
approval





Publish



EMBOpress

Author-side validation interface

 Robert Bosch Stiftung SourceData admin | about | Welcome [Thomas](#) logg

Rab25 increases cellular ATP and glycogen stores protecting cancer cells from bioenergetic stress.

Validation steps

- Paper summary
- 1. Experimental design
- Figure 1 overview
- Figure 2 overview
- Figure 3 overview
- Figure 4 overview
- Figure 5 overview
- Figure 6 overview

Paper summary 0

1. This paper contains **6** figures, **6** of which have been processed into panels. A total of **39** panels have been created, **33** of which needs to be reviewed.

2. **86** tag entities have been created.

- 1. **35** tag entities have been normalized with identifiers from external reference databases. The normalization of **32** tag entities needs to be reviewed.
- 2. **51** tag entities have not been normalized. You might suggest normalization for some / all of them.

experimental design						normalization / annotation		
Fig. 1	Fig. 2	Fig. 3	Fig. 4	Fig. 5	Fig. 6			

start review...

Author-side validation interface

Rab25 increases cellular ATP and glycogen stores protecting cancer cells from bioenergetic stress.

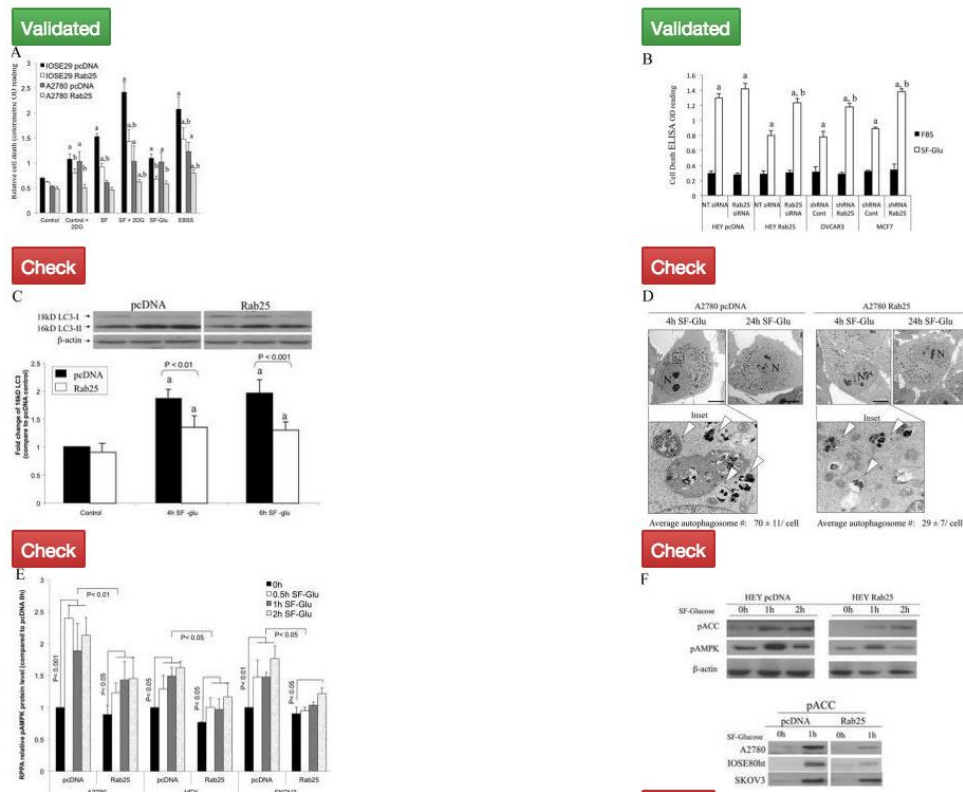
Rab25 increases cellular ATP and glycogen stores protecting cancer cells from bioenergetic stress.

- Validation steps
- Paper summary
 - 1. Experimental design
 - Figure 1 overview
 - Figure 2 overview
 - Figure 3 overview
 - Figure 4 overview
 - Figure 5 overview
 - Figure 6 overview

- Validation steps
- Paper summary
- This pane
 - 86 ta
- Figure 1 overview
 - Figure 1-A
 - Figure 1-B
 - Figure 1-C
 - Figure 1-D
 - Figure 1-E
 - Figure 1-F
 - Figure 1-G
 - Figure 1-H
 - Figure 2 overview
 - Figure 3 overview
 - Figure 4 overview
 - Figure 5 overview
 - Figure 6 overview
 - 2. Normalization
 - normalization

Figure 1

This figure has been divided into 8 panels, 6 of which need to be reviewed.



Author-side validation interface

Stb EMBO Robert Bosch Stiftung SourceData admin | about | Welcome Thomas log

Rab25 increases cellular ATP and glycogen stores protecting cancer cells from bioenergetic stress.

Validation steps

- Paper summary
- 1. Experimental design
- Figure 1 overview
- Figure 2 overview
- Figure 3 overview
- Figure 4 overview
- Figure 5 overview
- Figure 6 overview

Validation steps

- Paper summary
- 1. Experimental design
- Figure 1 overview
- Figure 1-A
- Figure 1-B
- Figure 1-C
- Figure 1-D
- Figure 1-E
- Figure 1-F
- Figure 1-G
- Figure 1-H
- Figure 2 overview
- Figure 3 overview
- Figure 4 overview
- Figure 5 overview
- Figure 6 overview

Figure 1

This figure has been divided into 8 panels, 6 of which need to be reviewed.

Paper summary

- 1. Experimental design
- Figure 1 overview
- Figure 1-A
- Figure 1-B
- Figure 1-C
- Figure 1-D
- Figure 1-E
- Figure 1-F
- Figure 1-G
- Figure 1-H
- Figure 2 overview
- Figure 3 overview
- Figure 4 overview
- Figure 5 overview
- Figure 6 overview

Figure 1-C

This panel has 8 tags. 1 tag is not mentioned in the caption * but are part of the panel image.

To modify the experimental scheme, drag and drop tag icons to change their role. Click on 'I approved this scheme' when done. Tag normalization for this panel might be reviewed in the 'linked tag list' tab.

Condition	pcDNA	Rab25
Control	1.0	1.0
4h SF-glu	~1.8	~1.4
6h SF-glu	~2.0	~1.4

Figure 1-C
Rab25 regulates autophagy activity in ovarian cancer cells under serum and glucose deprivation conditions. Western blot for the 16kD LC3-II fragment, indicative of autophagy activity, in A2780 cells after 4 and 6 h of serum and glucose withdrawal

Approve roles [Linked tag list](#)

Approval required! I approve this scheme

Biological Component

- A2780
- pcDNA
- *

Experiment Variable

- Intervention Target: Rab25, serum, glucose
- Assayed Component: LC3-II
- Normalizing Component
- Reporter Component

Author-side validation interface

Rab25 increas
bioenergetic

Validation steps

Paper summary

1. Experimental design

Figure 1 overview

Figure 2 overview

Figure 3 overview

Figure 4 overview

Figure 5 overview



















Figure 6 overview

Paper summary

1. This p
panels
2. 86 tag
 1. 3
T
 2. 5
a

normalization

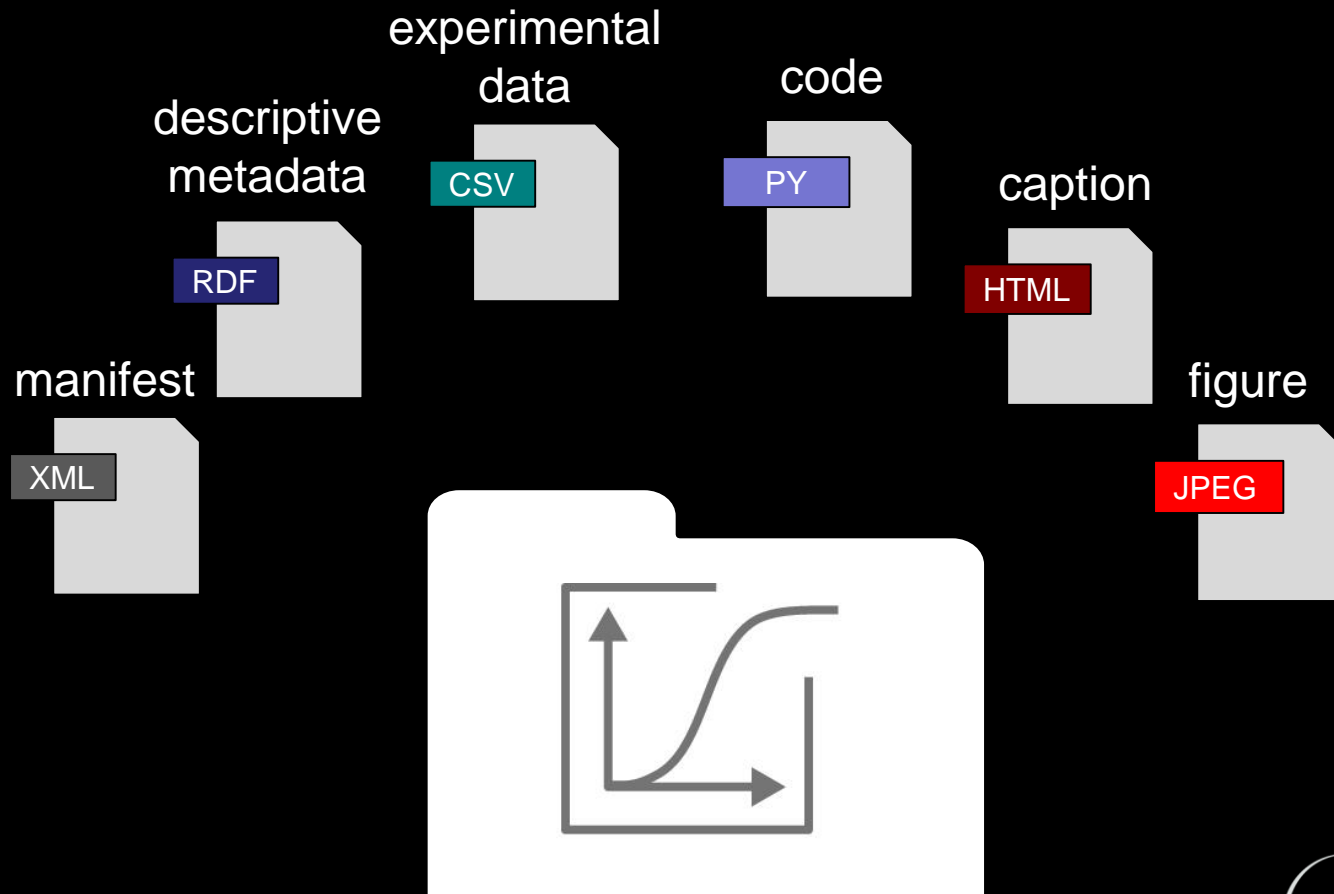
Use this form to validate or reject the association of one or several identifiers from reference resources (databases) with each tag. Click on an identifier to get a summary of the database entry.

Tag	Species	Database link	Actions	Panels	
 2DG, DG		ChEBI:15866 ⓘ	approved	8 panels	0
 amino acid		ChEBI:33709 ⓘ	approved	Figure 1-A	2
 ATP		ChEBI:15422 ⓘ	approved	8 panels	0
 glucose		ChEBI:17234 ⓘ	approved	19 panels	0
 glycogen		ChEBI:28087 ⓘ	approved	11 panels	0
 MK2206		ChEBI:67271 ⓘ	approved	7 panels	0
 oligomycin		ChEBI:25675 ⓘ	approve reject	2 panels	0
 Rab25	Homo sapiens	NCBI gene:57111 ⓘ	approved	2 panels	0
 Rab25, rab25	Homo sapiens	NCBI gene:57111 ⓘ	approve reject	32 panels	0
 acetyl-CoA carboxylase, ACC	Homo sapiens	Uniprot:Q13085 ⓘ	approve reject	4 panels	0
 actin		Uniprot:Q7ZV17 ⓘ	approve reject	Figure 1-F	0
 AKT	Homo sapiens	Uniprot:G3V2I6 ⓘ	approve reject	3 panels	0
 AKT	Homo sapiens	Uniprot:P31749 ⓘ	approve reject	10 panels	0
 GLUT1	Homo sapiens	Uniprot:P11166 ⓘ	approve reject	2 panels	0
 GS	Homo sapiens	Uniprot:P13807 ⓘ	approve reject	Figure 3-A	0
 GSK3	Homo sapiens	Uniprot:P49840 ⓘ	approve reject	3 panels	0
 GSK3		Uniprot:J9Y056 ⓘ	approve reject	Figure 3-C	0
 LC3-II		Uniprot:A6NCE7 ⓘ	approve reject	Figure 1-C	0

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