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Building Scholarly Knowledge Bases with Crowdsourcing and Text Mining

Markus Stocker

@markusstocker

Leibniz Gemeinschaft

European Heart Journal (2017) 38, 362–372
doi:10.1093/eurheartj/ehw333

BASIC SCIENCE

Iron-regulatory proteins secure iron availability in cardiomyocytes to prevent heart failure

Saba Haddad[1,2], Yong Wang[1,2], Bruno Galy[3,4], Mortimer Korf-Klingebiel[1,2], Valentin Hirsch[1,2], Abdul M. Baru[1,2], Fatemeh Rostami[1,2], Marc R. Reboll[1,2], Jörg Heineke[2], Ulrich Flögel[5], Stephanie Groos[6], André Renner[7], Karl Toischer[8], Fabian Zimmermann[9], Stefan Engeli[10], Jens Jordan[10], Johann Bauersachs[2], Matthias W. Hentze[3], Kai C. Wollert[1,2], and Tibor Kempf[1,2]*

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Received 30 November 2015; revised 27 June 2016; accepted 12 July 2016; online publish-ahead-of-print 21 August 2016

See page 373 for the editorial comment on this article (doi: 10.1093/eurheartj/ehw386)

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Conclusions ID in cardiomyocytes impairs mitochondrial respiration and adaptation to acute and chronic increases in workload. Iron supplementation restores cardiac energy reserve and function in iron-deficient hearts.

Keywords Iron deficiency • Heart failure • Energy metabolism • Extracellular flux analysis • ^{31}P-Magnetic resonance spectroscopy

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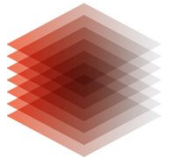
Scholarly knowledge?

http://doi.org/10.1093/eurheartj/ehw333



The Problem

Our scholarly knowledge base is a document repository

```
drwxrwxr-x  2 ms ms    4096 Mai
drwxrwxr-x 24 ms ms    4096 Jan
-rw-rw-r--  1 ms ms  464860 Jul 1
-rw-rw-r--  1 ms ms 1957590 Dez
-rw-rw-r--  1 ms ms 2771349 Dez
-rw-rw-r--  1 ms ms 4574609 Dez
-rw-rw-r--  1 ms ms   25917 Okt
-rw-rw-r--  1 ms ms 1320733 Dez 2
-rw-rw-r--  1 ms ms   33103 Dez
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-rw-rw-r--  1 ms ms 1069108 Nov 2
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-rw-rw-r--  1 ms ms  270079 Dez
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-rw-rw-r--  1 ms ms  395402 Dez
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-rw-rw-r--  1 ms ms 1152643 Jan
-rw-rw-r--  1 ms ms 3275257 Dez
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-rw-rw-r--  1 ms ms 1555364 Dez
-rw-rw-r--  1 ms ms 1794496 Dez
-rw-rw-r--  1 ms ms  250187 Dez
```


Table 1 gives some basic data on the selected repositories including their type, year of foundation, base location, underlying software, and whether the repository is certified or not[8]. Being generalist, these repositories do not have a specific designated community (**CCSDS, 2012**). In fact, the communities that use each repository are quite diverse each other, e.g., Figshare and Zenodo datasets are less discipline focused than CSIRO ones (cf. Tab. 4). This heterogeneity is not expected to impact on the criteria we based our investigation because of the discipline-agnostic nature of the proposed criteria.

Table 1 Excel | CSV

Scientific Data Repositories studied.

	Type	Founded	Country	Software	Cert.
3TU.Datacentrum	Institution	2008	NLD	In-house	√[a]
CSIRO DAP	Institution	2011	AUS	In-house	
Dryad	Organization	2008	USA	DSpace	
Figshare	Company	2011	GBR	In-house	
Zenodo	Organization	2013	CHE	Invenio	

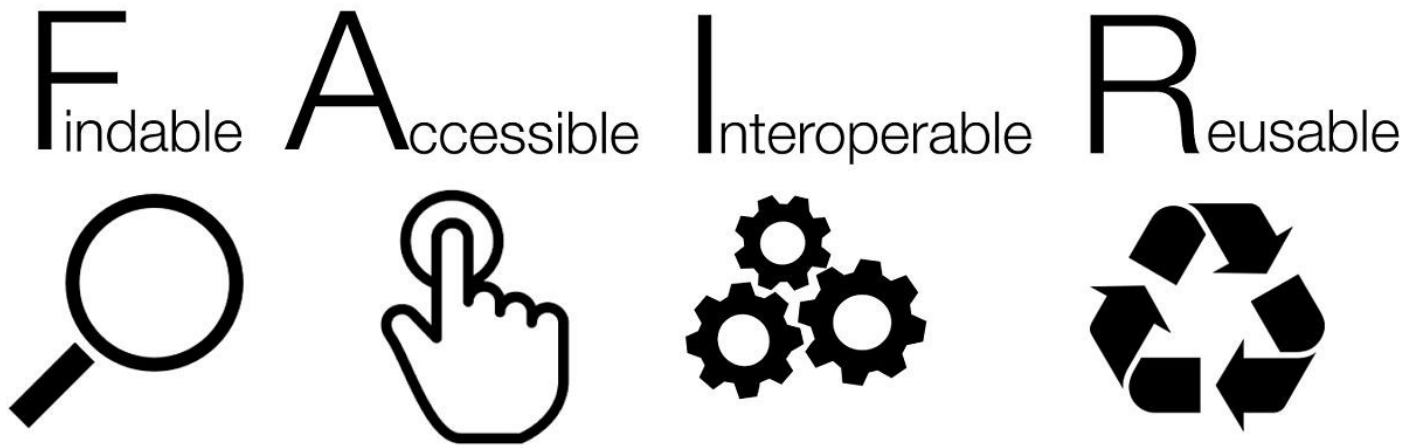
[a]Data Seal of Approval

Excel | CSV

Before analysing in detail the support that these repositories offer to research data publishing, we provide an overview of the content of these repositories up to December 2015.

JUMP TO DISCUSSIONS

Abstract
1 Introduction
2 Repository Selection
3 Published Datasets: an Overview
4 Analysis
5 Conclusion and Prospect
Competing Interests
Notes
Acknowledgments
Author contributions
References



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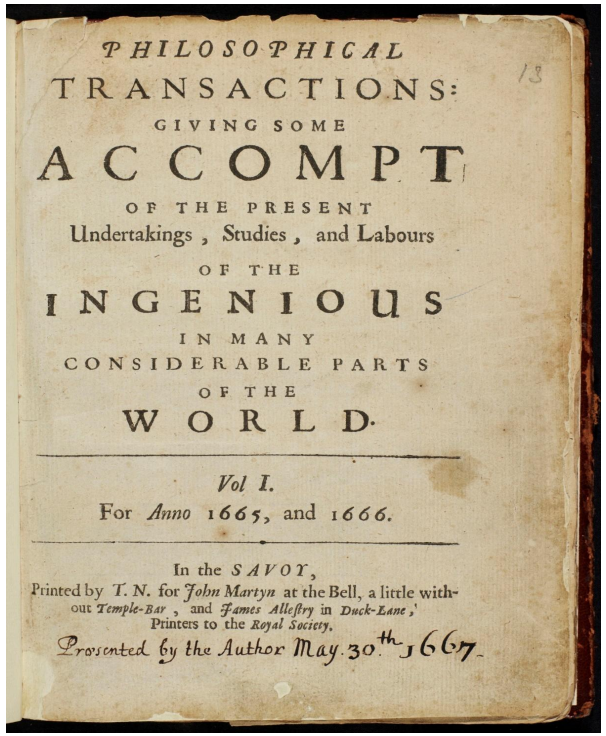
Digitization of scholarly communications



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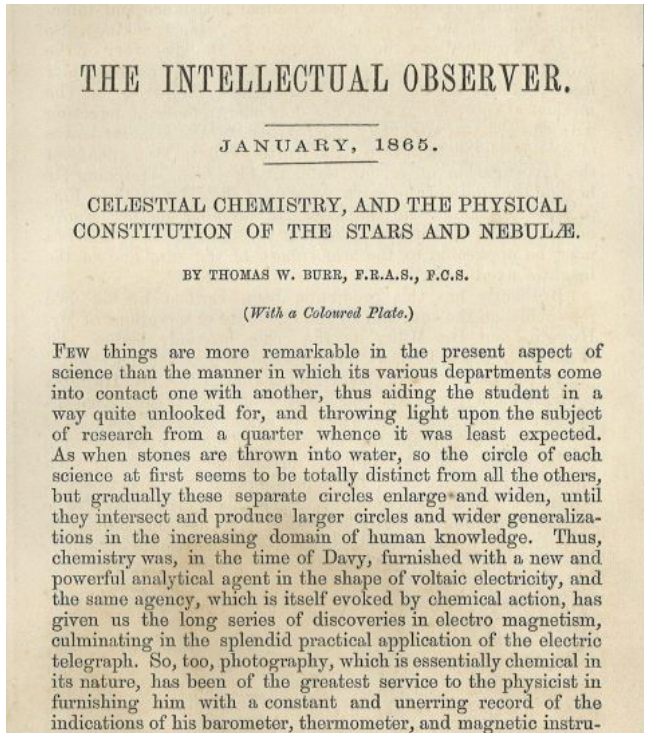
In the *SAVOY*,
Printed by *T. N.* for *John Martyn* at the Bell, a little without *Temple-Bar*, and *James Allestry* in *Duck-Lane*,
Printers to the *Royal Society*.
Presented by the Author May. 30th 1667



THE INTELLECTUAL OBSERVER.

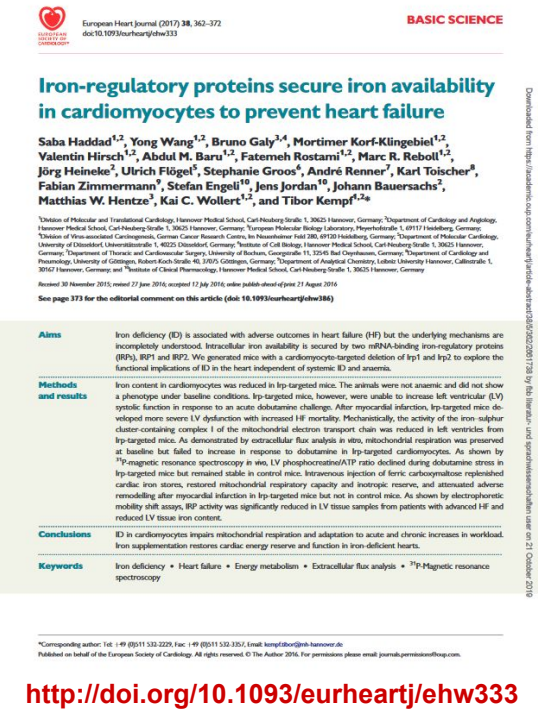
JANUARY, 1865.

CELESTIAL CHEMISTRY, AND THE PHYSICAL CONSTITUTION OF THE STARS AND NEBULÆ.

BY THOMAS W. BURR, F.R.A.S., F.C.S.

(*With a Coloured Plate.*)

FEW things are more remarkable in the present aspect of science than the manner in which its various departments come into contact one with another, thus aiding the student in a way quite unlooked for, and throwing light upon the subject of research from a quarter whence it was least expected. As when stones are thrown into water, so the circle of each science at first seems to be totally distinct from all the others, but gradually these separate circles enlarge and widen, until they intersect and produce larger circles and wider generalizations in the increasing domain of human knowledge. Thus, chemistry was, in the time of Davy, furnished with a new and powerful analytical agent in the shape of voltaic electricity, and the same agency, which is itself evoked by chemical action, has given us the long series of discoveries in electro magnetism, culminating in the splendid practical application of the electric telegraph. So, too, photography, which is essentially chemical in its nature, has been of the greatest service to the physicist in furnishing him with a constant and unerring record of the indications of his barometer, thermometer, and magnetic instru-



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… almost four centuries

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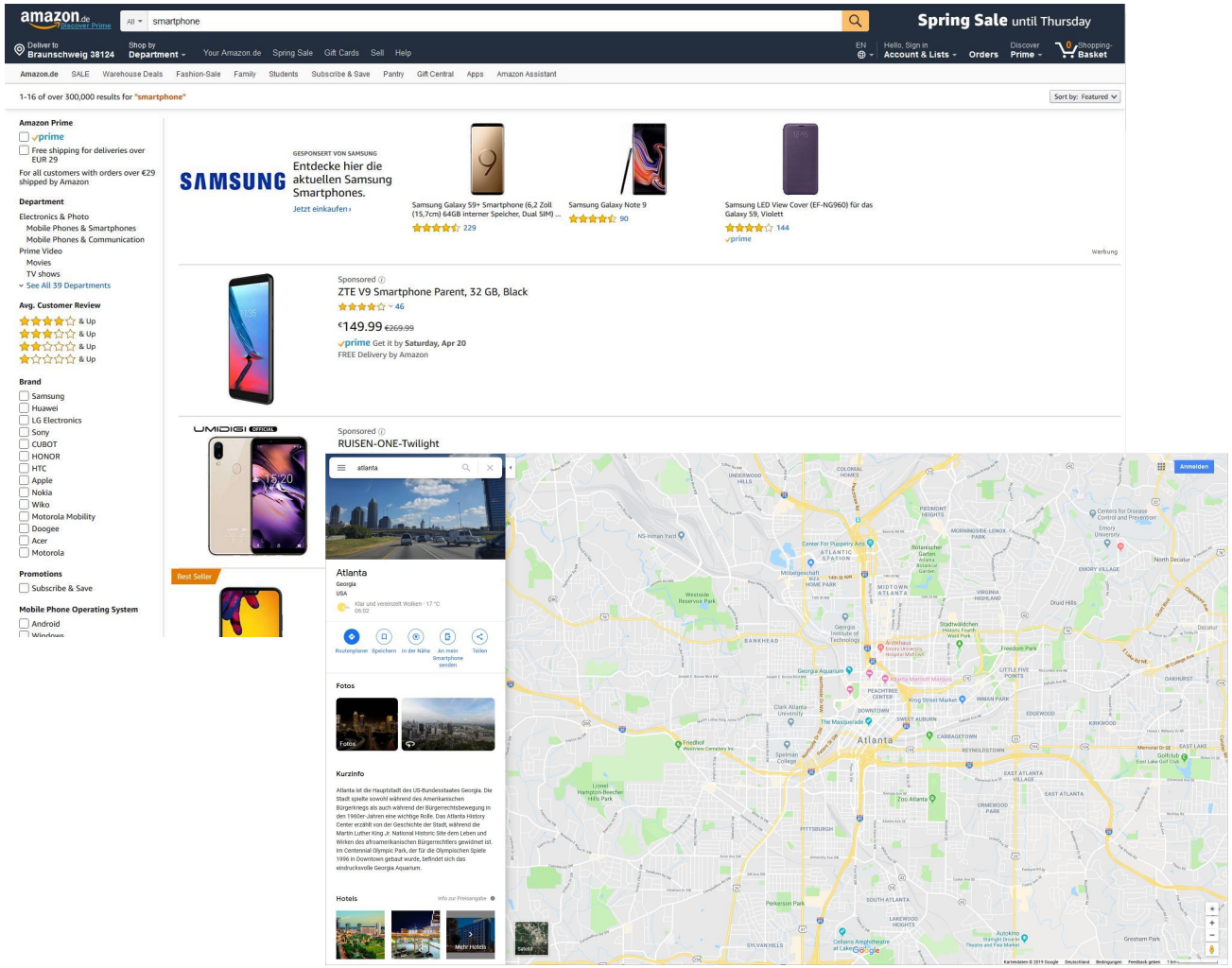

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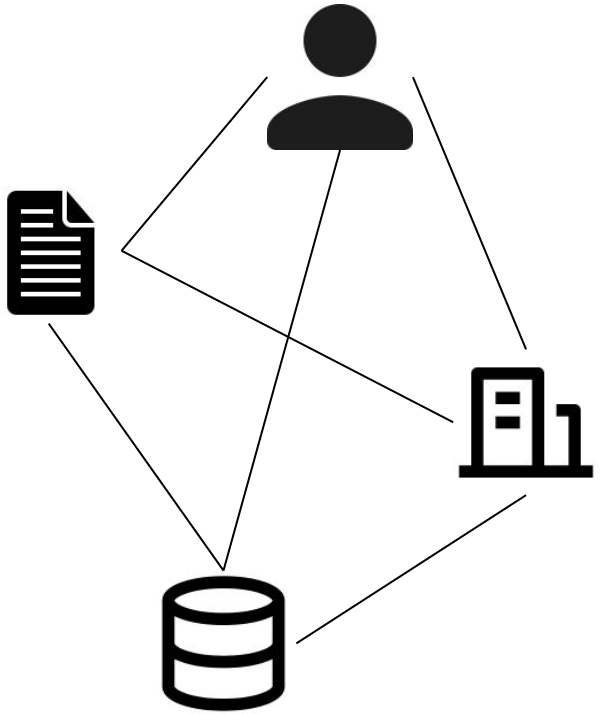

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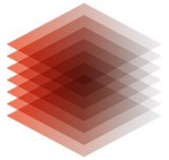
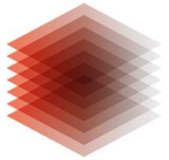
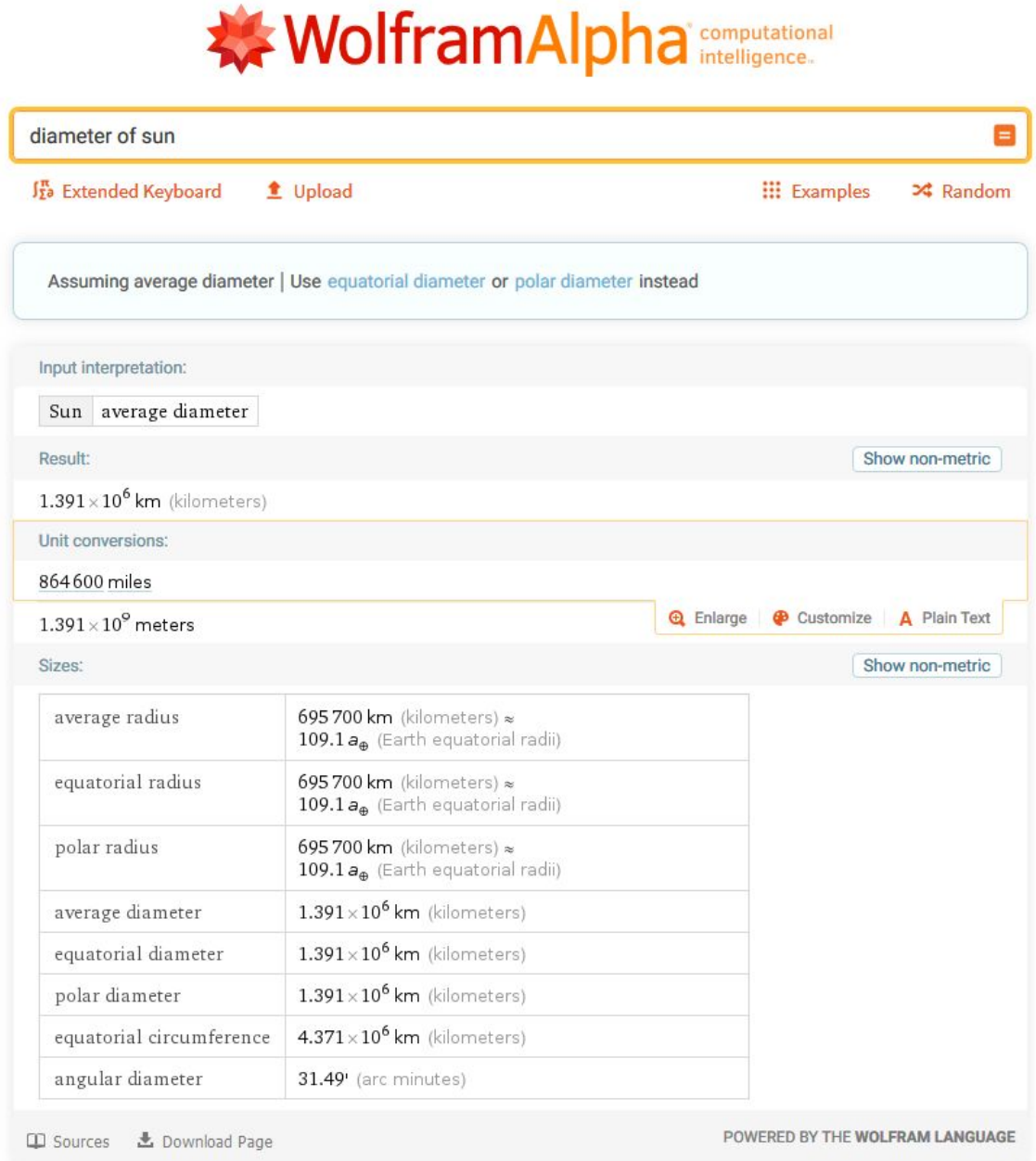


Can we build a knowledge base?



Can we build a knowledge base?

… or knowledge bases?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diameter of sun
Extended Keyboard
Upload
Examples
Random
Assuming average diameter | Use equatorial diameter or polar diameter instead
Input interpretation:
Sun | average diameter
Result:
Show non-metric
1.391 × 10^6 km (kilometers)
Unit conversions:
864 600 miles
1.391 × 10^9 meters
Enlarge
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Plain Text
Sizes:
Show non-metric
average radius | 695 700 km (kilometers) ≈ 109.1 a⊕ (Earth equatorial radii)
equatorial radius | 695 700 km (kilometers) ≈ 109.1 a⊕ (Earth equatorial radii)
polar radius | 695 700 km (kilometers) ≈ 109.1 a⊕ (Earth equatorial radii)
average diameter | 1.391 × 10^6 km (kilometers)
equatorial diameter | 1.391 × 10^6 km (kilometers)
polar diameter | 1.391 × 10^6 km (kilometers)
equatorial circumference | 4.371 × 10^6 km (kilometers)
angular diameter | 31.49' (arc minutes)
Sources
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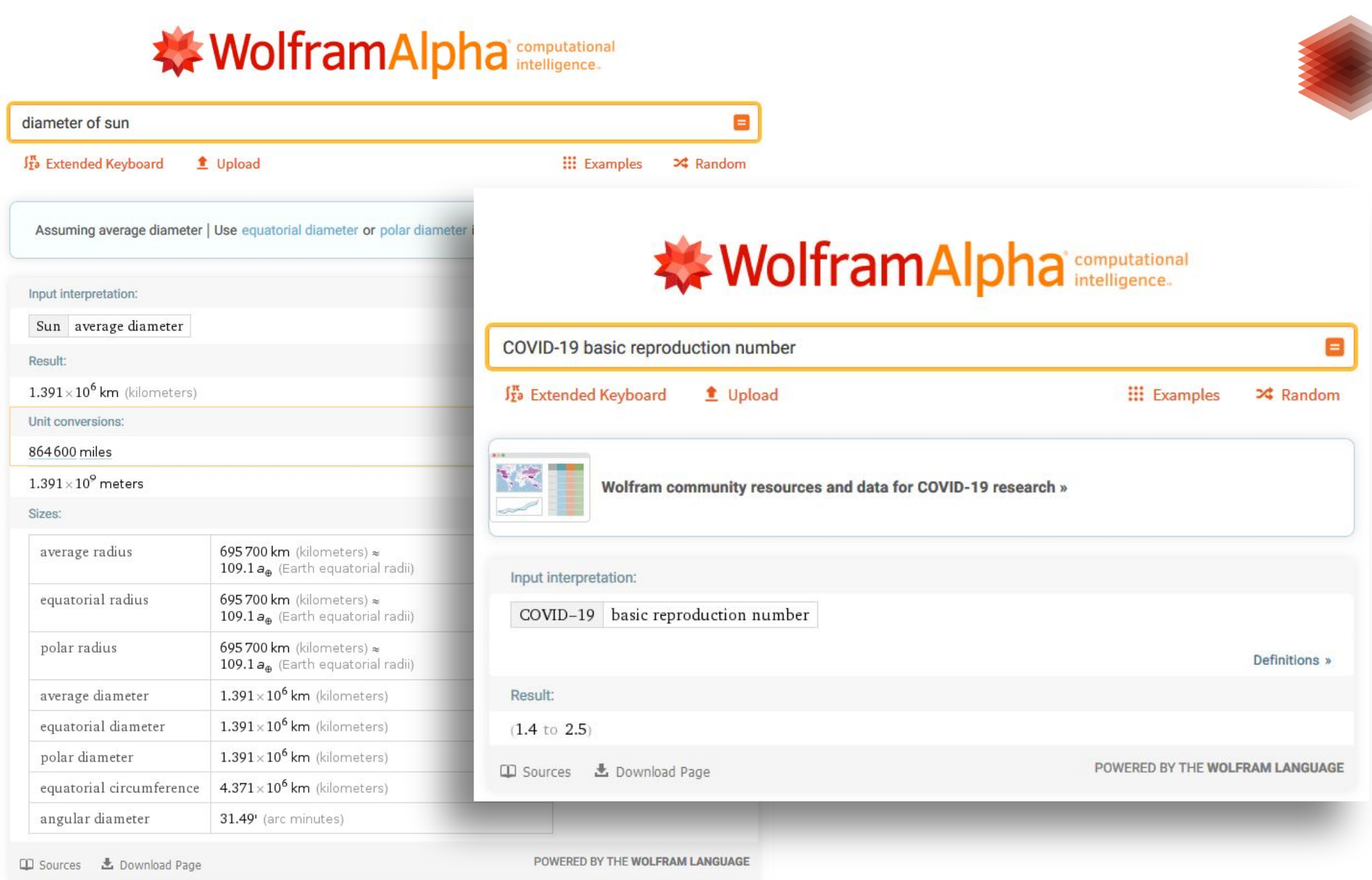
WolframAlpha computational intelligence
diameter of sun
Extended Keyboard
Upload
Examples
Random
Assuming average diameter | Use equatorial diameter or polar diameter
Input interpretation:
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Result:
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equatorial circumference | 4.371×10^6 km (kilometers)
angular diameter | 31.49' (arc minutes)
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COVID-19 | basic reproduction number
Definitions »
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(1.4 to 2.5)
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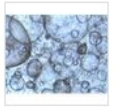
	1	2	3
Title	**Analysis of Amphetamine in Blood by Gas chromatography**	**Analysis of Methamphetamine in Blood by Solid phase extraction**	**Analysis of 3,4-Methylenedioxymethamphetamine in Blood by Solvent extraction**
CAS Method Number	1-125-CAS-235751	1-125-CAS-60925	1-125-CAS-12925
Method Category	Forensic Analysis; Addictive Drug Assay	Forensic Analysis; Active Pharmaceutical Ingredient and Metabolite Analysis	Forensic Analysis
Technique	Mass spectrometry; Gas chromatography; Extraction	Gas chromatography-mass spectrometry; Solid phase extraction	Mass spectrometry; Reversed phase liquid chromatography; Solvent extraction
Analyte	Amphetamine; Methamphetamine	Amphetamine; Methamphetamine	Tetrahydrocannabinol; 3,4-Methylenedioxyamphetamine; Amphetamine; 3,4- View All
Matrix	Hair; Liver; Lung; Spleen; Urine; Blood; Brain; Adipose tissue	Blood	Blood

protocols.io



Derivation of organoids from primary tumour tissue

Hazel Rogers[1], Laura Letchford[1], Sara Vieira[1], Maria Garcia-Casado[1], Mya Fekry-Troll[1], Charlotte Beaver[1], Rachel Nelson[1], Hayley Francies[1], Mathew Garnett[1]

[1]Wellcome Sanger Institute

Jul 07, 2020

1 Works for me

dx.doi.org/10.17504/protocols.io.bfvnjn5e

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Cellular Generation and Phenotyping

Hazel Rogers

Steps Abstract Guidelines Warnings Materials Metadata Metrics

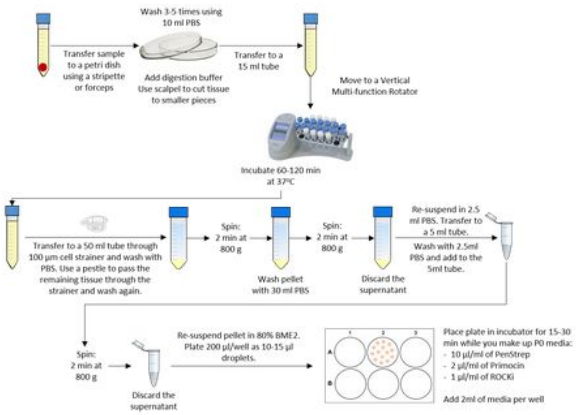
BEFORE STARTING

- Thaw BME2 aliquot overnight at 4 °C and dilute 4:1 with appropriate organoid media (tissue specific) to make an 80% stock
- Ensure cell culture plates have been stored overnight in 37 °C incubator
- Pre-warm organoid culture media to room temperature
- Prepare 100 mg/ml collagenase stock. Re-suspend 1 g collagenase II in 10 mL PBS. Aliquots can be stored at -20 °C for up to one year.
- Prepare digestion buffer:

Reagent	Stock Concentration	Volume
Organoid Media	-	9.5 ml
Collagenase	100 mg/ml	0.5 ml
Primocin	50 mg/ml	0.02 ml
Penicillin Streptomycin	100X	0.1 ml
Rock inhibitor (Y-27632) (10 mM)	10 mM	0.01 ml

Process Diagram

1



Data overview
Meta-analyses
Citation explorer
Ontology explorer

Overview of the studies

14 Number of effects

9 Number of studies

6 Number of papers

1785 Total participants

Show studies by
(•) Country/Region ( ) Year of data collection ( ) Sample size

Number of studies (log-scale) per country
1.5
1
0.5
0

Filter studies

Filter studies by choosing the inclusion criteria.

You can choose between the treatments in the study (Treatment 1 and Treatment 2) that manipulate or measure one or more independent variables (IV), sample and study characteristics (e.g., proportion of males in study), quantitative study results (e.g., proportion of cooperation), and paper metadata (e.g., year of publication).

Use one of our selection examples

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Analyse the effects of Honesty-Humility on cooperation.

Or make your own selection

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Treatment 2 +
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Study Characteristics +
Quantitative Study Results +
Paper Metadata +

Explore your selection

Click on the rows in the table to de-select effect sizes

Show 10 entries Search:

	Effect ID	Citation	Title	d	r	Study	DOI
1	ENG01139_1.10.1.0 [d] [r]	Hilbig, Zettler & Heydasch (2012)	Personality, Punishment and Public Goods: Strategic Shifts Towards Cooperation as a Matter of Dispositional Honesty–Humility	0.303	0.15	Study ENG01139_1	http://dx.doi.org/10.1002/per.830
2	ENG01139_1.9.1.0 [d] [r]	Hilbig, Zettler & Heydasch (2012)	Personality, Punishment and Public Goods: Strategic Shifts Towards Cooperation as a Matter of Dispositional Honesty–Humility	0.699	0.33	Study ENG01139_1	http://dx.doi.org/10.1002/per.830
3	ENG01139_2.10.1.0 [d] [r]	Hilbig, Zettler & Heydasch (2012)	Personality, Punishment and Public Goods: Strategic Shifts Towards Cooperation as a Matter of Dispositional Honesty–Humility	0.08	0.04	Study ENG01139_2	http://dx.doi.org/10.1002/per.830
4	ENG01139_2.9.1.0 [d] [r]	Hilbig, Zettler & Heydasch (2012)	Personality, Punishment and Public Goods: Strategic Shifts Towards Cooperation as a Matter of Dispositional Honesty–Humility	0.516	0.25	Study ENG01139_2	http://dx.doi.org/10.1002/per.830
5	ENG01334_1.6.1.0 [d] [r]	Kieslich & Hilbig (2014)	Cognitive conflict in social dilemmas: An analysis of response dynamics	0.387	0.19	Study ENG01334_1	NA
6	ENG01707_3.5.1.0 [d] [r]	Mischkowski & Glöckner (2016)	Spontaneous cooperation for prosocials, but not for proselfs: Social value orientation moderates spontaneous cooperation behavior	0.277	0.137	Study ENG01707_3	http://dx.doi.org/10.1038/srep21555
7	ENG01896_1.9.1.0 [d] [r]	Perugini, Tan, & Zizzo (2010)	Which is the More Predictable Gender? Public Good Contribution and Personality	0.122	0.061	Study ENG01896_1	http://dx.doi.org/10.2139/ssrn.676806
8	ENG02424_1.5.1.0 [d] [r]	Urbig, Terjesen, Procher, Muehlfeld, & Van Witteloostuijn (2016)	Come on and take a free ride: Contributing to public goods in native and foreign language settings	0.232	0.115	Study ENG02424_1	NA
9	ENG02641_1.4.1.0 [d] [r]	Zettler, Hilbig & Heydasch (2013)	Two sides of one coin: Honesty–humility and situational factors mutually shape social dilemma decision making	0.62	0.296	Study ENG02641_1	http://dx.doi.org/10.1016/j.jrp.2013.01.012
10	ENG02641_1.5.1.0 [d] [r]	Zettler, Hilbig & Heydasch (2013)	Two sides of one coin: Honesty–humility and situational factors mutually shape social dilemma decision making	0.44	0.215	Study ENG02641_1	http://dx.doi.org/10.1016/j.jrp.2013.01.012

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Analyse the effects of Honesty-Humility on cooperation. ▼

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Analyse the effects of Honesty-Humility on cooperation.

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Treatment 1 +
Treatment 2 +
Sample Characteristics +
Study Characteristics +
Quantitative Study Results +
Paper Metadata +

Explore your selection

Click on the rows in the table to de-select effect sizes

Show 10 entries Search:

	Effect ID	Citation	Title	d	r	Study	DOI
1	ENG01139_1.10.1.0 [d] [r]	Hilbig, Zettler & Heydasch (2012)	Personality, Punishment and Public Goods: Strategic Shifts Towards Cooperation as a Matter of Dispositional Honesty–Humility	0.303	0.15	Study ENG01139_1	http://dx.doi.org/10.1002/per.830
2	ENG01139_1.9.1.0 [d] [r]	Hilbig, Zettler & Heydasch (2012)	Personality, Punishment and Public Goods: Strategic Shifts Towards Cooperation as a Matter of Dispositional Honesty–Humility	0.699	0.33	Study ENG01139_1	http://dx.doi.org/10.1002/per.830
3	ENG01139_2.10.1.0 [d] [r]	Hilbig, Zettler & Heydasch (2012)	Personality, Punishment and Public Goods: Strategic Shifts Towards Cooperation as a Matter of Dispositional Honesty–Humility	0.08	0.04	Study ENG01139_2	http://dx.doi.org/10.1002/per.830
4	ENG01139_2.9.1.0 [d] [r]	Hilbig, Zettler & Heydasch (2012)	Personality, Punishment and Public Goods: Strategic Shifts Towards Cooperation as a Matter of Dispositional Honesty–Humility	0.516	0.25	Study ENG01139_2	http://dx.doi.org/10.1002/per.830
5	ENG01334_1.6.1.0 [d] [r]	Kieslich & Hilbig (2014)	Cognitive conflict in social dilemmas: An analysis of response dynamics	0.387	0.19	Study ENG01334_1	NA
6	ENG01707_3.5.1.0 [d] [r]	Mischkowski & Glöckner (2016)	Spontaneous cooperation for prosocials, but not for proselfs: Social value orientation moderates spontaneous cooperation behavior	0.277	0.137	Study ENG01707_3	http://dx.doi.org/10.1038/srep21555
7	ENG01896_1.9.1.0 [d] [r]	Perugini, Tan, & Zizzo (2010)	Which is the More Predictable Gender? Public Good Contribution and Personality	0.122	0.061	Study ENG01896_1	http://dx.doi.org/10.2139/ssrn.676806
8	ENG02424_1.5.1.0 [d] [r]	Urbig, Terjesen, Procher, Muehlfeld, & Van Witteloostuijn (2016)	Come on and take a free ride: Contributing to public goods in native and foreign language settings	0.232	0.115	Study ENG02424_1	NA
9	ENG02641_1.4.1.0 [d] [r]	Zettler, Hilbig & Heydasch (2013)	Two sides of one coin: Honesty–humility and situational factors mutually shape social dilemma decision making	0.62	0.296	Study ENG02641_1	http://dx.doi.org/10.1016/j.jrp.2013.01.012
10	ENG02641_1.5.1.0 [d] [r]	Zettler, Hilbig & Heydasch (2013)	Two sides of one coin: Honesty–humility and situational factors mutually shape social dilemma decision making	0.44	0.215	Study ENG02641_1	http://dx.doi.org/10.1016/j.jrp.2013.01.012

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Data overview
Meta-analyses
Citation explorer
Ontology explorer

Overview of the studies

14 Number of effects

9 Number of studies

6 Number of papers

1785 Total participants

Show studies by: (•) Country/Region ( ) Year of data collection ( ) Sample size

Number of studies (log-scale) per country: 1.5, 1, 0.5, 0

Explore your selection

Click on the rows in the table to de-select effect sizes

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	Effect ID	Citation	Title	d	r	Study	DOI
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Treatment 2

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Show 10 entries — Search:

Effect ID

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2 ENG01139_1.9.1.0 [d] [r]
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Human Cooperation Databank

coda

- Data overview
- Meta-analyses
- Citation explorer
- Ontology explorer

Overview of the studies

14	9	6	1785
Number of effects	Number of studies	Number of papers	Total participants

Show studies by

(•) Country/Region ( ) Year of data collection ( ) Sample size

Number of studies (log-scale) per country

1.5
1
0.5
0

Visualise Results

Meta-analytic models | Forest plots | Meta-regression | Moderators | Data Table | Publication bias | Power Analysis

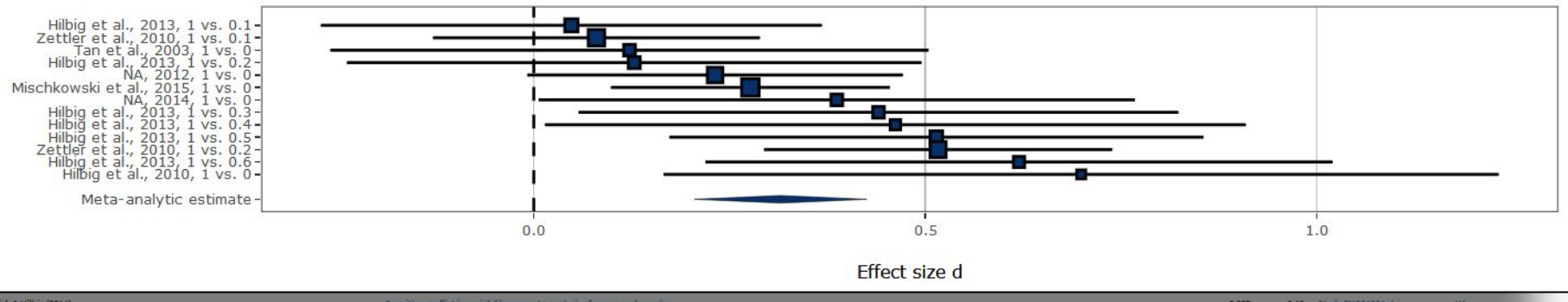
Choose one moderator:

Show studies by

(•) Forest Plot ( ) Violin Plot

A forest plot graphically displays effect sizes from a number of scientific studies addressing the same question, along with the overall results.

source: https://en.wikipedia.org/wiki/Forest_plot



Filter studies

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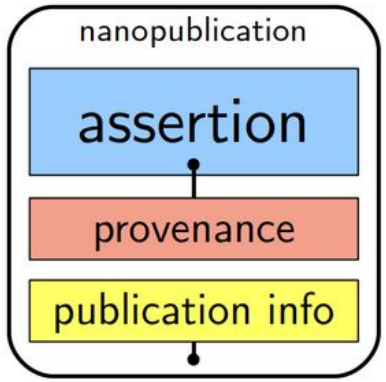
Nanopublications

FAIR data containers for scientific results, and more



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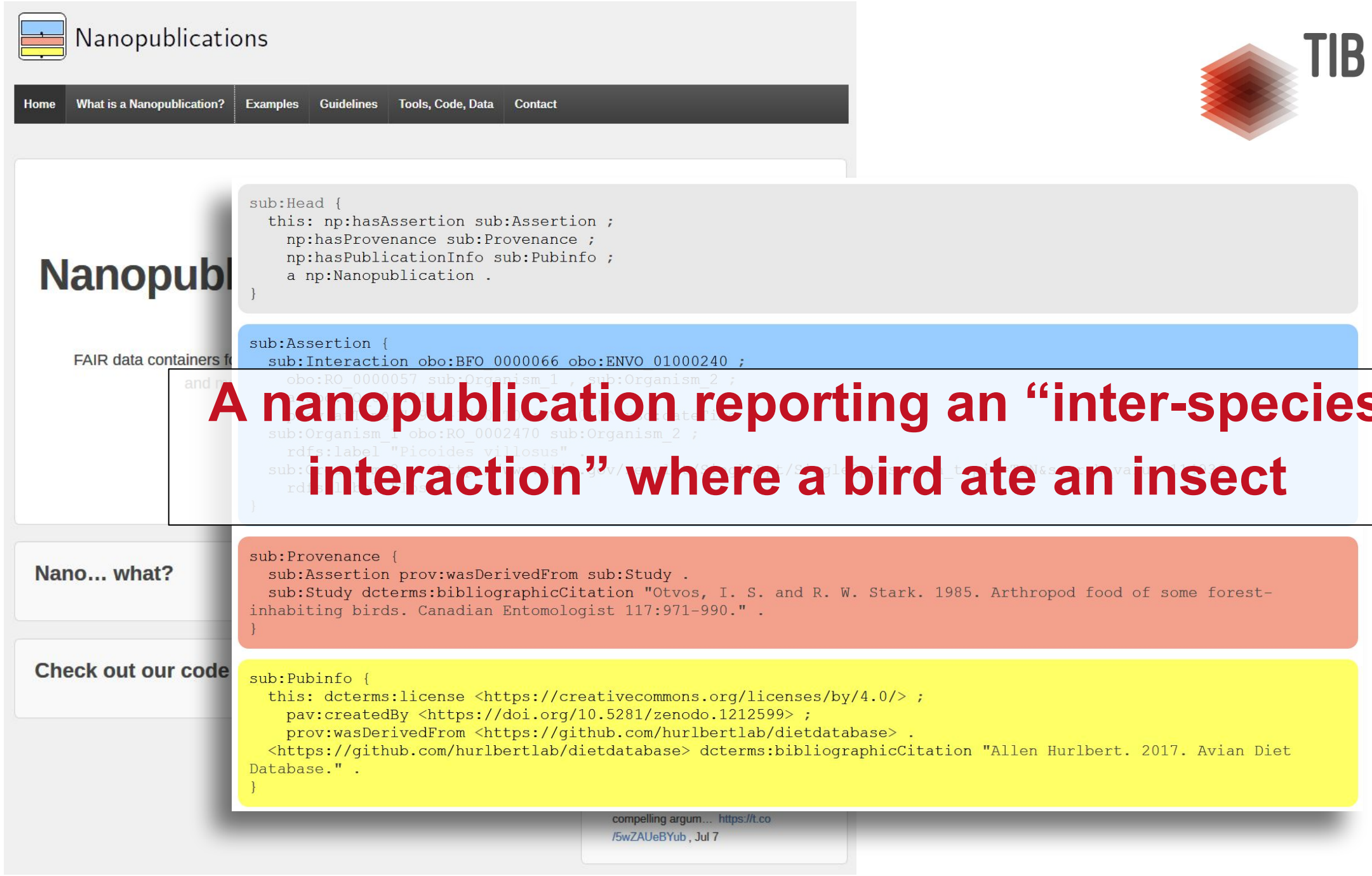
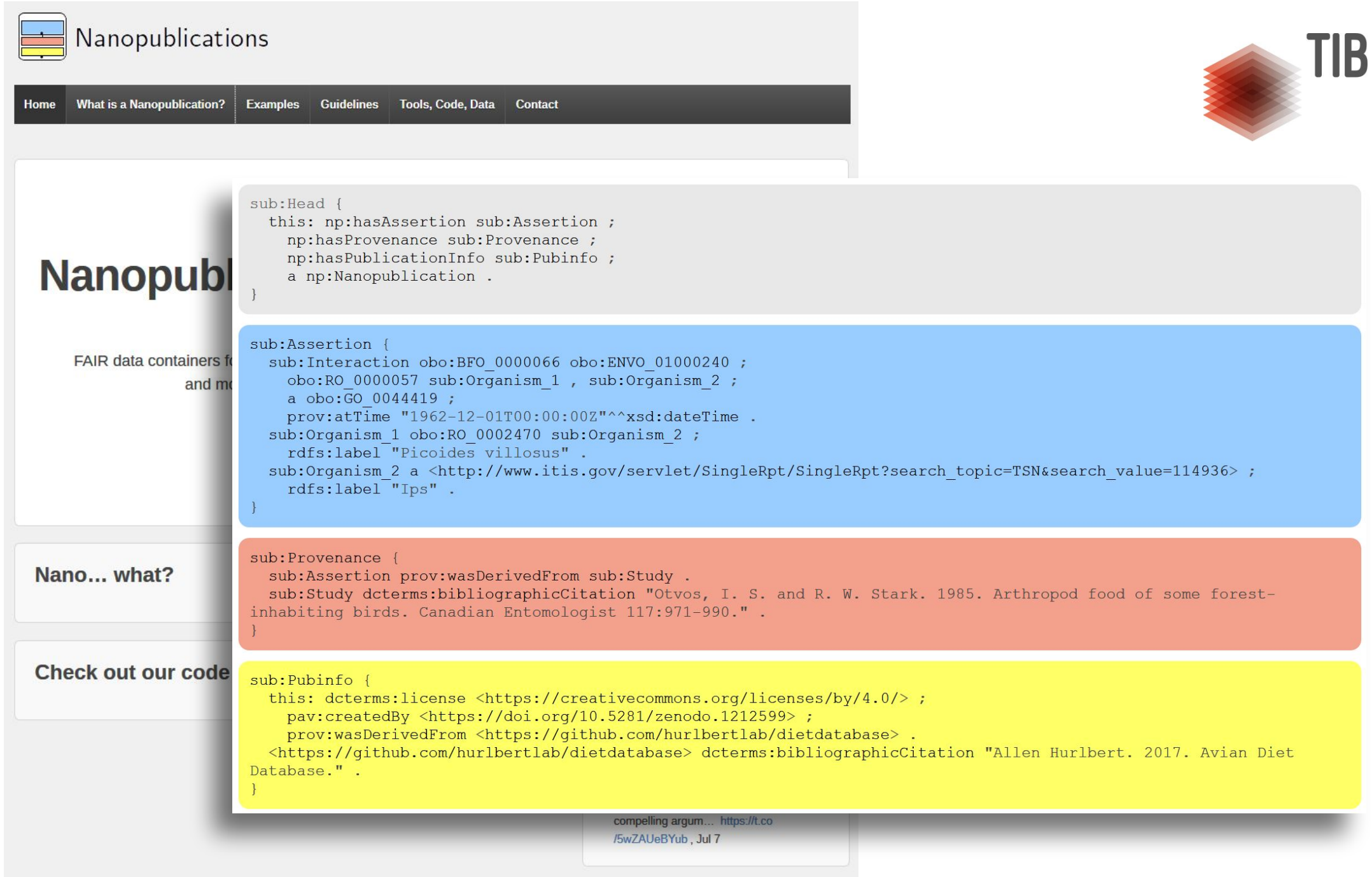
- RT @TLeungMD : Looking fwd to sharing this work as an oral presentation at @iscb #Bioontologies COSI today! #physiciansuicide rsch… https://t.co/udJ4i1Bt9H , Jul 15
- RT @fjvost : Have you ever heard of #nanopublications ? During the @CODATANews webinar @barendmons has presented compelling argum… https://t.co/5wZAUeBYub , Jul 7

TIB



A nanopublication reporting an “inter-species interaction” where a bird ate an insect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FAIR data containers f
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Nano... what?
Check out our code
sub:Head {
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prov:atTime "1962-12-01T00:00:00Z"^^xsd:dateTime .
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sub:Organism_2 a <http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=114936> ;
rdfs:label "Ips" .
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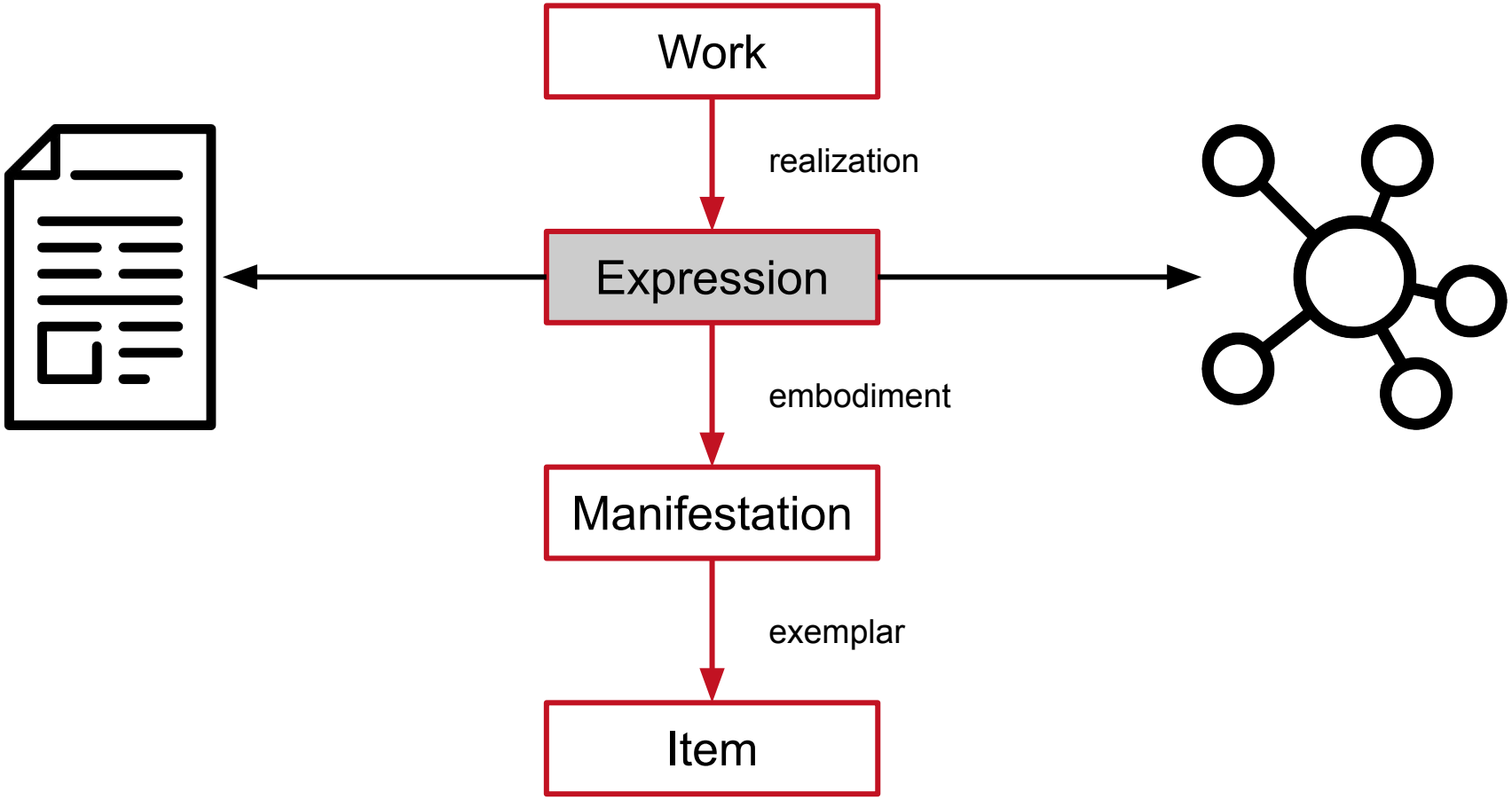
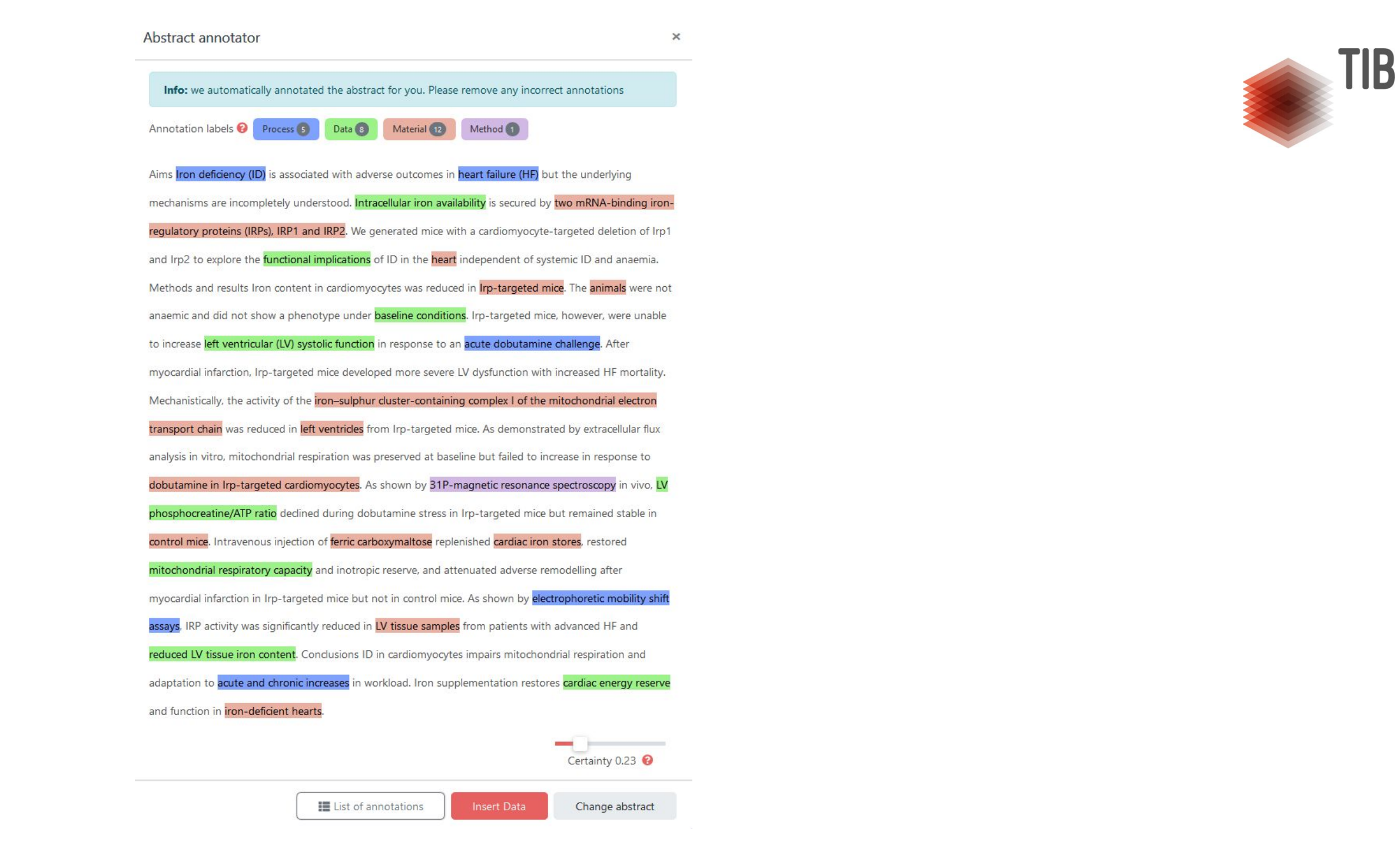


Functional Requirements for Bibliographic Records

With Crowdsourcing and Text Mining


Abstract annotator
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Process 5
Data 8
Material 12
Method 1
Aims Iron deficiency (ID) is associated with adverse outcomes in heart failure (HF) but the underlying mechanisms are incompletely understood. Intracellular iron availability is secured by two mRNA-binding iron-regulatory proteins (IRPs), IRP1 and IRP2. We generated mice with a cardiomyocyte-targeted deletion of Irp1 and Irp2 to explore the functional implications of ID in the heart independent of systemic ID and anaemia. Methods and results Iron content in cardiomyocytes was reduced in Irp-targeted mice. The animals were not anaemic and did not show a phenotype under baseline conditions. Irp-targeted mice, however, were unable to increase left ventricular (LV) systolic function in response to an acute dobutamine challenge. After myocardial infarction, Irp-targeted mice developed more severe LV dysfunction with increased HF mortality. Mechanistically, the activity of the iron–sulphur cluster-containing complex I of the mitochondrial electron transport chain was reduced in left ventricles from Irp-targeted mice. As demonstrated by extracellular flux analysis in vitro, mitochondrial respiration was preserved at baseline but failed to increase in response to dobutamine in Irp-targeted cardiomyocytes. As shown by 31P-magnetic resonance spectroscopy in vivo, LV phosphocreatine/ATP ratio declined during dobutamine stress in Irp-targeted mice but remained stable in control mice. Intravenous injection of ferric carboxymaltose replenished cardiac iron stores, restored mitochondrial respiratory capacity and inotropic reserve, and attenuated adverse remodelling after myocardial infarction in Irp-targeted mice but not in control mice. As shown by electrophoretic mobility shift assays, IRP activity was significantly reduced in LV tissue samples from patients with advanced HF and reduced LV tissue iron content. Conclusions ID in cardiomyocytes impairs mitochondrial respiration and adaptation to acute and chronic increases in workload. Iron supplementation restores cardiac energy reserve and function in iron-deficient hearts.
Certainty 0.23
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Change abstract

Abstract annotator

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Annotation labels Process 5 Data 8 Material 12 Method 1

Aims Iron deficiency (ID) is associated with adverse outcomes in heart failure (HF) b
mechanisms are incompletely understood. Intracellular iron availability is secured b
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and function in iron-deficient hearts.

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Barend Mons

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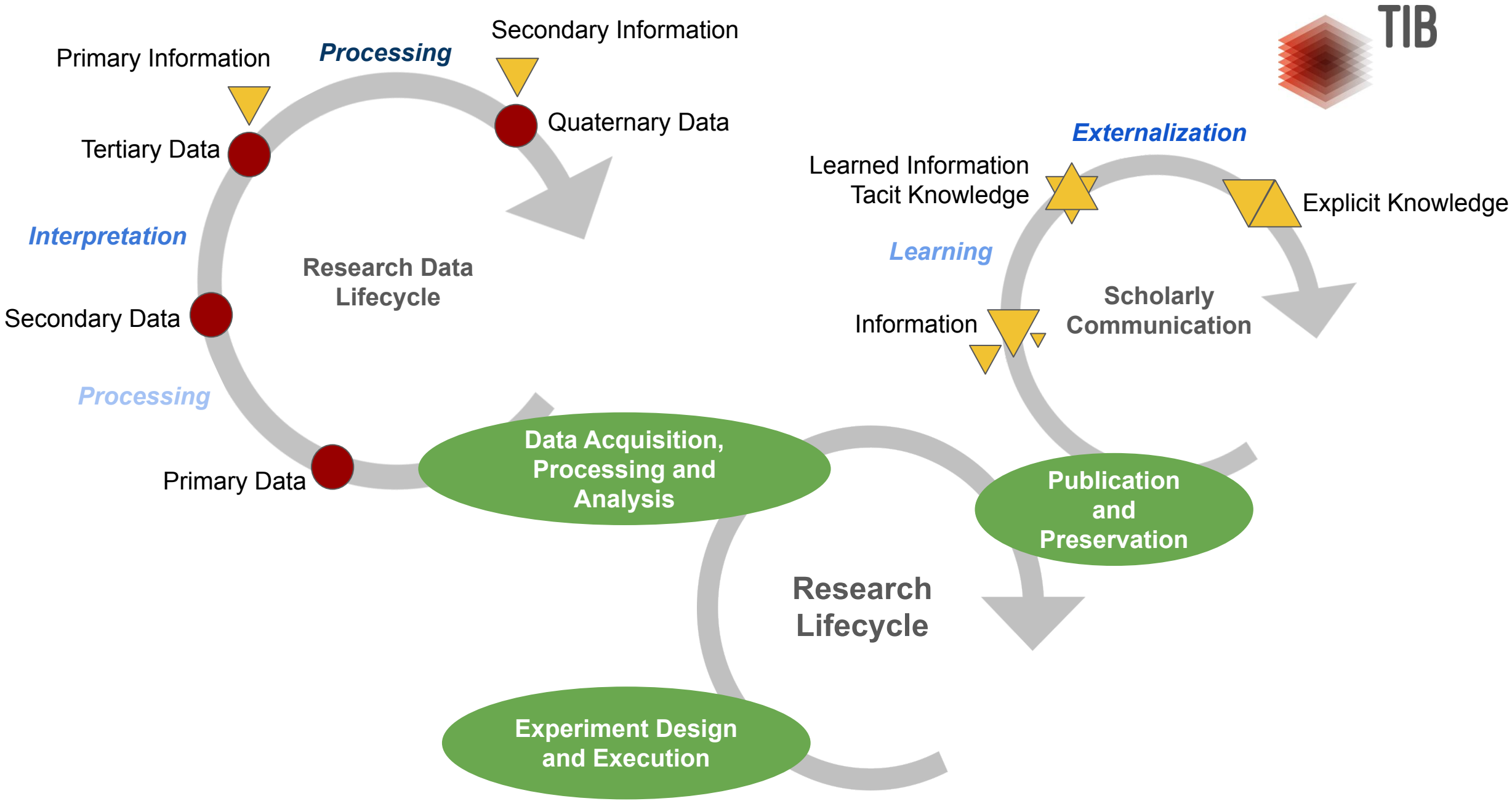
Abstract

Computational Biology needs computer-readable information records. Increasingly, meta-analysed and pre-digested information is being used in the follow up of high throughput experiments and other investigations that yield massive data sets. Semantic enrichment of plain text is crucial for computer aided analysis. In general people will think about semantic tagging as just another form of text mining, and that term has quite a negative connotation in the minds of some biologists who have been disappointed by classical approaches of text mining. Efforts so far have tried to develop tools and technologies that retrospectively extract the correct information from text, which is usually full of ambiguities. Although remarkable results have been obtained in experimental circumstances, the wide spread use of information mining tools is lagging behind earlier expectations. This commentary proposes to make semantic tagg

Text mining? .....Why bury it first and then mine it again?

tly, Sir Tim Berners-Lee, the inventor of the Web, said: 'Life sciences are particul
suitable for pioneering covery, many databases and information systems used by drug researchers are already in, or are ready to be transformed to, machine-readable formats' [1].

TIB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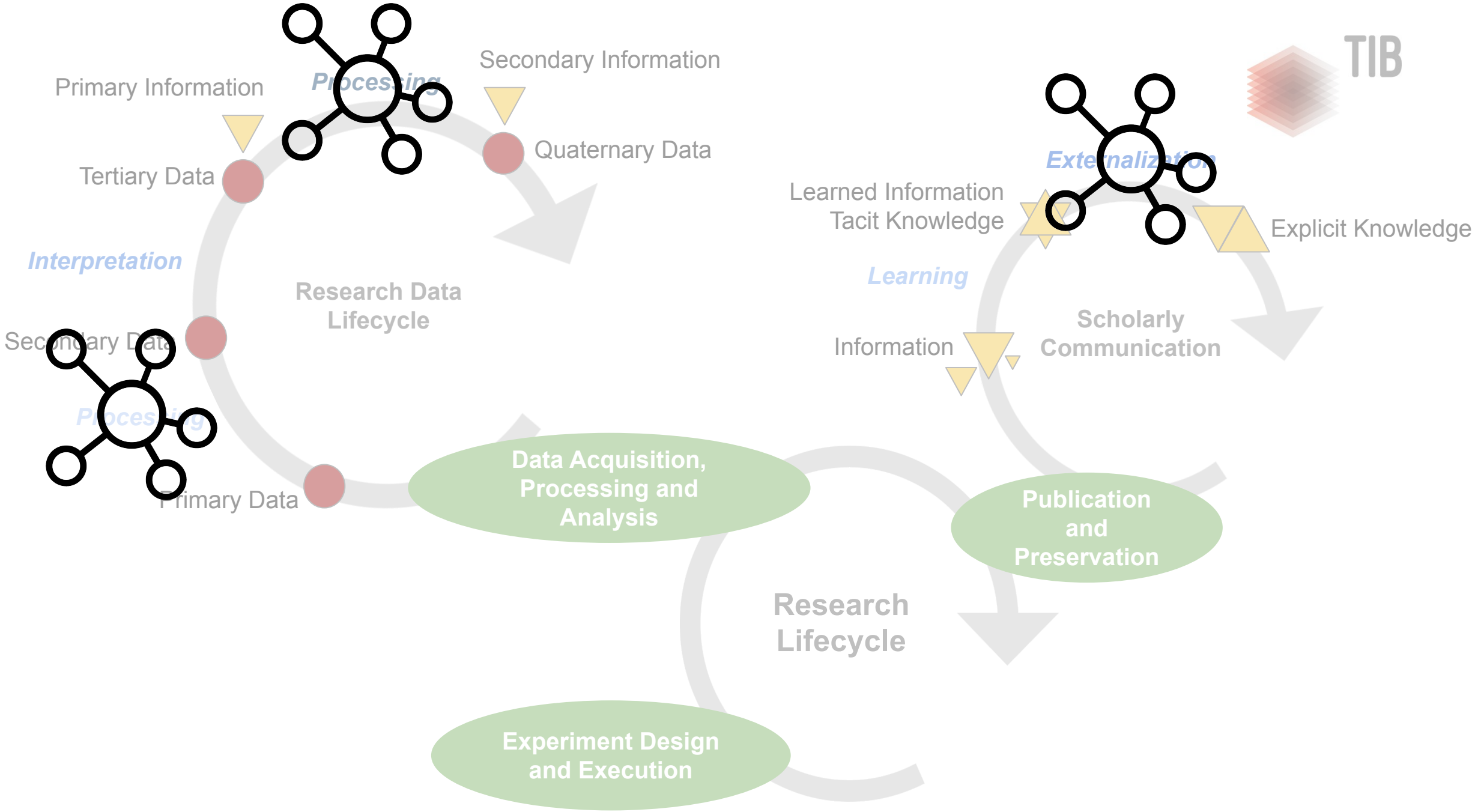
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Quaternary Data
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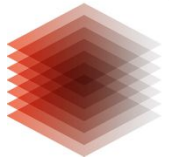

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- Twitter: https://twitter.com/orkg_org
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Example
COVID-19 basic reproduction number

Cornell University

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COVID-19 e-print

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[Submitted on 20 Mar 2020]

The early phase of the COVID-19 outbreak in Lombardy, Italy

Cereda D, Tirani M, Rovida F, Demicheli V, Ajelli M, Poletti P, Trentini F, Guzzetta G, Marziano V, Barone A, Magoni M, Deandrea S, Diurno G, Lombardo M, Faccini M, Pan A, Bruno R, Pariani E, Grasselli G, Piatti A, Gramegna M, Baldanti F, Melegaro A, Merler S

In the night of February 20, 2020, the first case of novel coronavirus disease (COVID-19) was confirmed in the Lombardy Region, Italy. In the week that followed, Lombardy experienced a very rapid increase in the number of cases. We analyzed the first 5,830 laboratory-confirmed cases to provide the first epidemiological characterization of a COVID-19 outbreak in a Western Country. Epidemiological data were collected through standardized interviews of confirmed cases and their close contacts. We collected demographic backgrounds, dates of symptom onset, clinical features, respiratory tract specimen results, hospitalization, contact tracing. We provide estimates of the reproduction number and serial interval. The epidemic in Italy started much earlier than February 20, 2020. At the time of detection of the first COVID-19 case, the epidemic had already spread in most municipalities of Southern-Lombardy. The median age for of cases is 69 years (range, 1 month to 101 years). 47% of positive subjects were hospitalized. Among these, 18% required intensive care. The mean serial interval is estimated to be 6.6 days (95% CI, 0.7 to 19). We estimate the basic reproduction number at 3.1 (95% CI, 2.9 to 3.2). We estimated a decreasing trend in the net reproduction number starting around February 20, 2020. We did not observe significantly different viral loads in nasal swabs between symptomatic and asymptomatic. The transmission potential of COVID-19 is very high and the number of critical cases may become largely unsustainable for the healthcare system in a very short-time horizon. We observed a slight decrease of the reproduction number, possibly connected with an increased population awareness and early effect of interventions. Aggressive containment strategies are required to control COVID-19 spread and catastrophic outcomes for the healthcare system.

Subjects: **Populations and Evolution (q-bio.PE)**
Cite as: arXiv:2003.09320 **[q-bio.PE]**
(or arXiv:2003.09320v1 **[q-bio.PE]** for this version)

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Results

The epidemic in Italy started much earlier than February 20, 2020. At the time of detection of the first COVID-19 case, the epidemic had already spread in most municipalities of Southern-Lombardy. The median age for of cases is 69 years (range, 1 month to 101 years). 47% of positive subjects were hospitalized. Among these, 18% required intensive care. The mean serial interval is estimated to be 6.6 days (95% CI, 0.7 to 19). We estimate the basic reproduction number at 3.1 (95% CI, 2.9 to 3.2). We estimated a decreasing trend in the net reproduction number starting around February 20, 2020. We did not observe significantly different viral loads in nasal swabs between symptomatic and asymptomatic.

Here we provide an analysis of the first 5,830 laboratory-confirmed cases reported in Lombardy, with date of symptoms onset over the period from January 14 to March 8, 2020. Epidemiological analyses of the confirmed cases and their background demographic and exposure characteristics are presented here as well as the transmission dynamics of the infection within the Region. Also, the virological analysis on a subsample of the reported cases is included to provide preliminary assessment of the level of the viral load among symptomatic and asymptomatic cases.

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The early phase of the COVID-19 outbreak in Lombardy, Italy

2020 Virology Cereda D Tirani M Rovida F Demicheli Ajelli M Poletti P Trentini F Guzzetta G Marziano Barone A Magoni M Deandrea S Diurno G Lombardo M Faccini M Pan A Bruno R Pariani E Grasselli G Piatti A Gramegna M Baldanti F Melegaro A Merler S

Published in: *arXiv.org*

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Contribution 1

Research problems

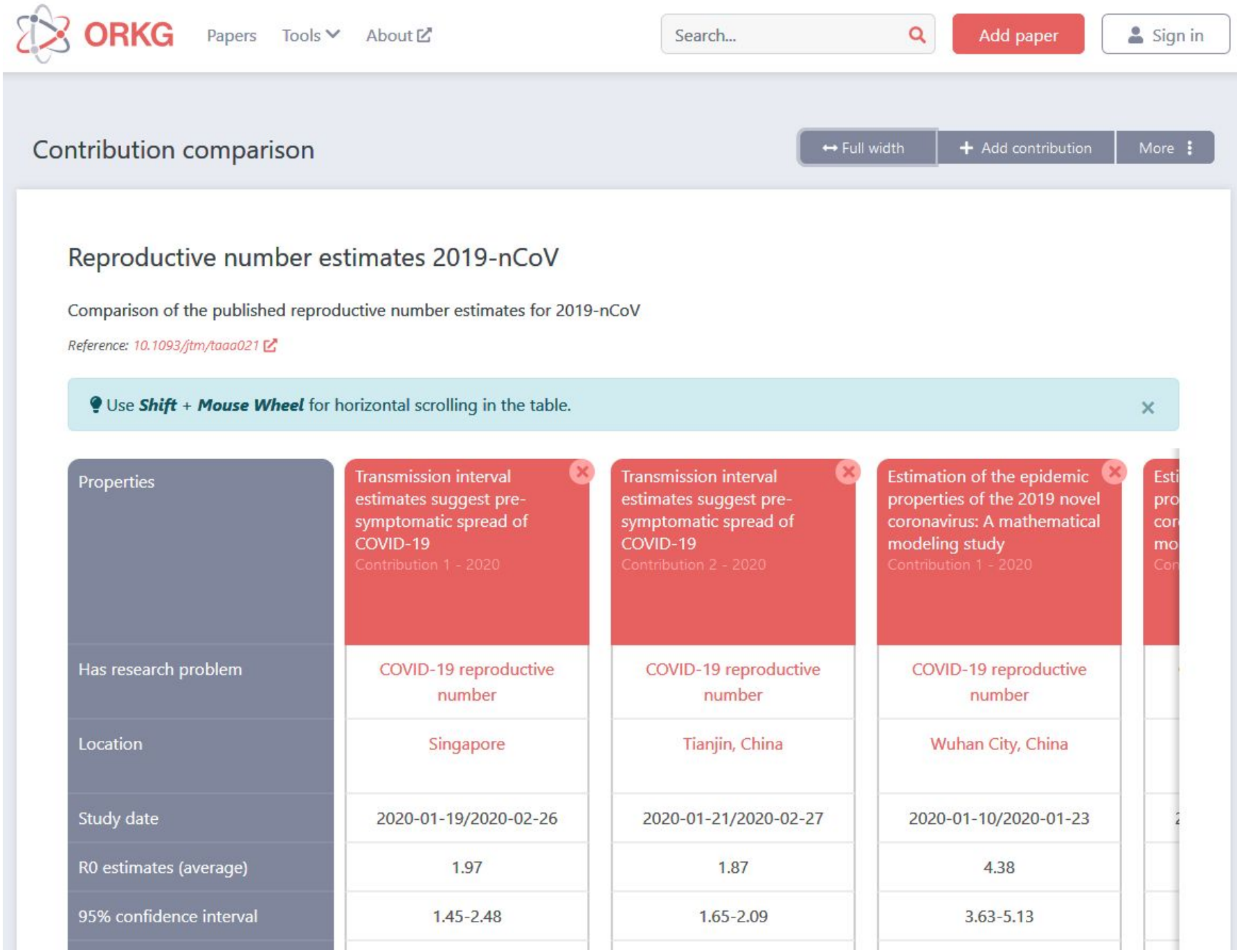
Add to comparison

COVID-19 reproductive number

Contribution data

95% Confidence interval	2.9-3.2
Location	Lombardy, Italy
R0 estimates (average)	3.1
Study date	2020-01-14/2020-03-08

Repeat for other papers, then ...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Reproductive number estimates 2019-nCoV
Comparison of the published reproductive number estimates for 2019-nCoV
Reference: 10.1093/jtm/taaa021
Use Shift + Mouse Wheel for horizontal scrolling in the table.
Properties
Transmission interval estimates suggest pre-symptomatic spread of COVID-19
Contribution 1 - 2020
Transmission interval estimates suggest pre-symptomatic spread of COVID-19
Contribution 2 - 2020
Estimation of the epidemic properties of the 2019 novel coronavirus: A mathematical modeling study
Contribution 1 - 2020
Has research problem
COVID-19 reproductive number
COVID-19 reproductive number
COVID-19 reproductive number
Location
Singapore
Tianjin, China
Wuhan City, China
Study date
2020-01-19/2020-02-26
2020-01-21/2020-02-27
2020-01-10/2020-01-23
R0 estimates (average)
1.97
1.87
4.38
95% confidence interval
1.45-2.48
1.65-2.09
3.63-5.13

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Launcher | R0-estimates-plot.ipynb

Code | Download | GitLab | Binder

/

Name

- binder
- R0-estimates-plot.ipy...
- R0-estimates-semanti...

```
[ ]: import requests
import datetime
import pandas as pd
import numpy as np
from orkg import ORKG
from bokeh.io import export_png
from bokeh.models import ColumnDataSource, HoverTool, WheelZoomTool, ResetTool, SaveTool, PanTool, DatetimeTickFormatter, Whisker
from bokeh.plotting import figure, show, output_notebook

output_notebook()
```

```
[ ]: def to_date(date):
    if '/' in date:
        date = date.split('/')[1]

    return datetime.date.fromisoformat(date)

def to_error(ci):
    if len(ci) == 0:
        return [np.nan, np.nan]

    bounds = ci.split('-')

    return [np.float32(bounds[0]), np.float32(bounds[1])]
```

```
[ ]: orkg = ORKG(host='https://orkg.org/orkg', simcomp_host='https://orkg.org/orkg/simcomp')

df = orkg.contributions.compare_dataframe(comparison_id='R12251')
```

```
[ ]: dates = np.array([to_date(x) for x in df.loc['Study date', :]])
values = np.float32(df.loc['R0 estimates (average)', :])
errors = np.array([to_error(x) for x in df.loc['95% Confidence interval', :]])
```

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Launcher | R0-estimates-plot.ipynb

Code | Download | GitLab | Binder

Name

- binder
- R0-estimates-plot.ipy...
- R0-estimates-semanti...

```
[ ]: import requests
     import datetime
     import pandas as pd
     import numpy as
     from orkg import
     from bokeh.io im
     from bokeh.model
     from bokeh.plott

     output_notebook()
```

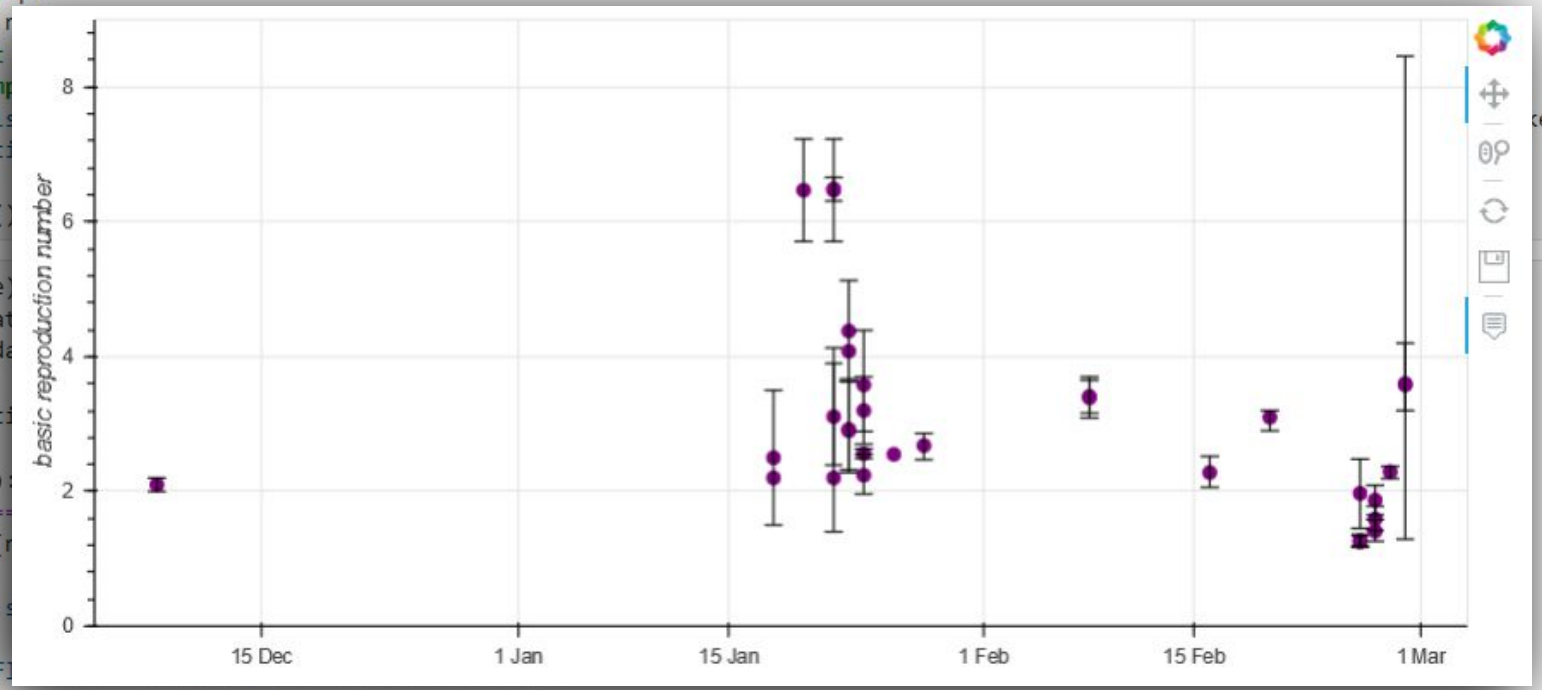
```
[ ]: def to_date(date
         if '/' in da
             date = d

         return dateti

     def to_error(ci):
         if len(ci) ==
             return [

         bounds = ci.

         return [np.f
```




```
[ ]: orkg = ORKG(host='https://orkg.org/orkg', simcomp_host='https://orkg.org/orkg/simcomp')

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```
[ ]: dates = np.array([to_date(x) for x in df.loc['Study date', :]])
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     errors = np.array([to_error(x) for x in df.loc['95% Confidence interval', :]])
```

Take aways

- Scholarly work can be realized as expressions other than an article
- Content can also be realized so that it is more machine actionable
- Thus easier to reuse, for machines and people
- Turning the vision and prototypes into reality at scale is very challenging
- Advance scholarly communication from digitization to digitalization
- In addition to PDF publish essential scholarly knowledge also in structured form
- Requires a significant rethinking and rewiring of the current approaches and infrastructure