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TECHNIK UND NATURWISSENSCHAFTEN
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TIB

Können Wissensgraphen die Kommunikation in der Wissenschaft verändern?

Markus Stocker (@markusstocker) und *Das Team*
Frankfurt, 10. Oktober 2019
DNB Tagung “Netzwerk maschinelle Verfahren in der Erschließung”

Leibniz Gemeinschaft

Was wäre wenn ...

- Die globale wissenschaftliche Wissensbasis mehr als ein Dokumentenverzeichnis wäre
- Wissenschaftliche Information und Wissen auch FAIR für Maschinen wäre

Was wäre wenn ...

- Die globale wissenschaftliche Wissensbasis mehr als ein Dokumentenverzeichnis wäre
- Wissenschaftliche Information und Wissen auch FAIR für Maschinen wäre
- Zur Zeit
  - Auffindbarkeit könnte besser sein
  - Angenommen Open Access ist Zugänglichkeit OK
  - Interoperabilität und Nachnutzung ist für Maschinen unmöglich

Was wäre wenn ...

- Die globale wissenschaftliche Wissensbasis mehr als ein Dokumentenverzeichnis wäre
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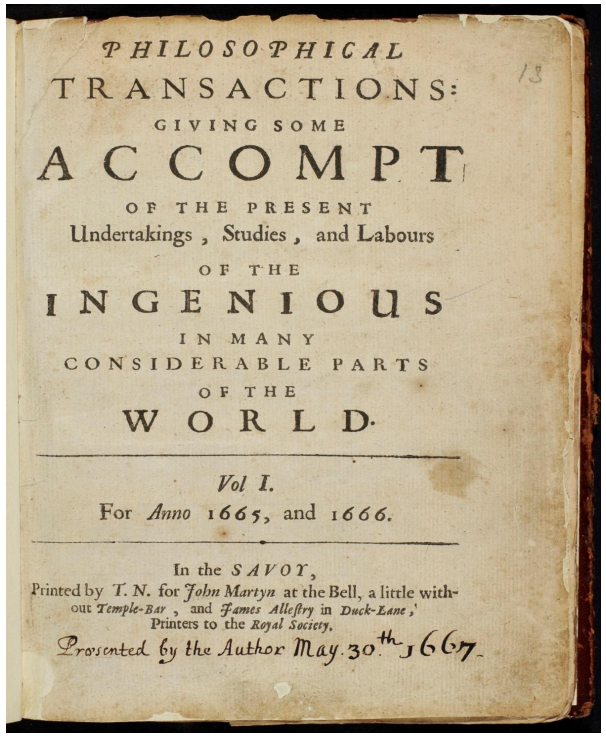
- Zur Zeit
  - Auffindbarkeit könnte besser sein
  - Angenommen Open Access ist Zugänglichkeit OK
  - Interoperabilität und Nachnutzung ist für Maschinen unmöglich
- Die Infrastruktur der wissenschaftlichen Kommunikation steckt im letzten Jahrhundert
- Es gab zwar eine Digitalisierung (engl. *digitization*) der Dokumente die zuvor gedruckt wurden
- Eine “digitale Revolution” (engl. *digitalization*) wie in anderen Bereichen ist aber ausgeblieben

Digitalisierung der wissenschaftlichen Kommunikation



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OF THE
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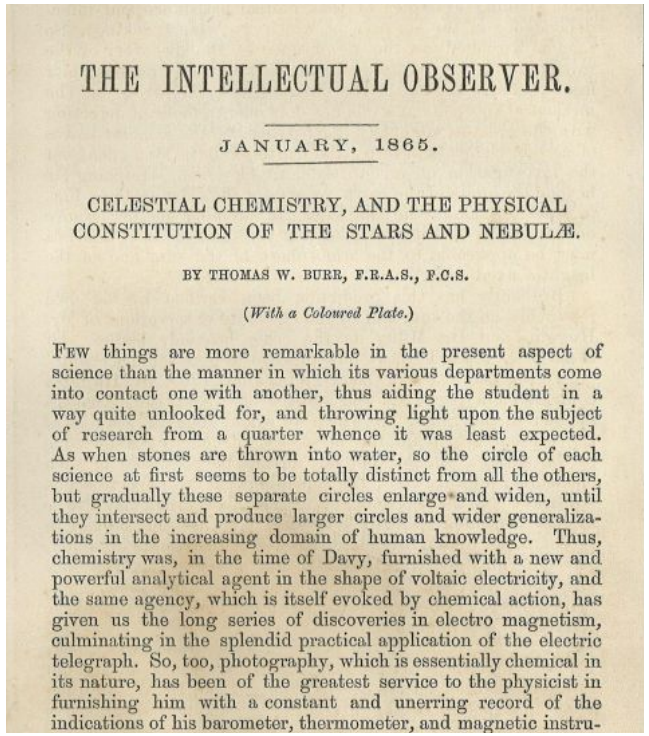
WORLD.

Vol I.
For *Anno* 1665, and 1666.

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.

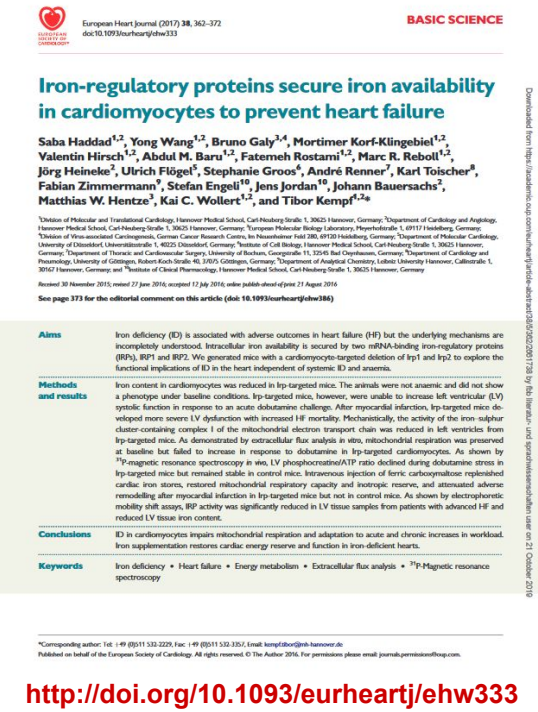
JANUARY, 1865.

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-



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[5], Ulrich Flögel[6], Stephanie Groos[6], André Renner[7], Karl Toischer[8], Fabian Zimmermann[9], Stefan Engeli[10], Jens Jordan[10], Johann Bauersachs[5], Matthias W. Hentze[3], Kai C. Wollert[1,2], and Tibor Kempf[1,2]*

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)

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 ^{31}P-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.

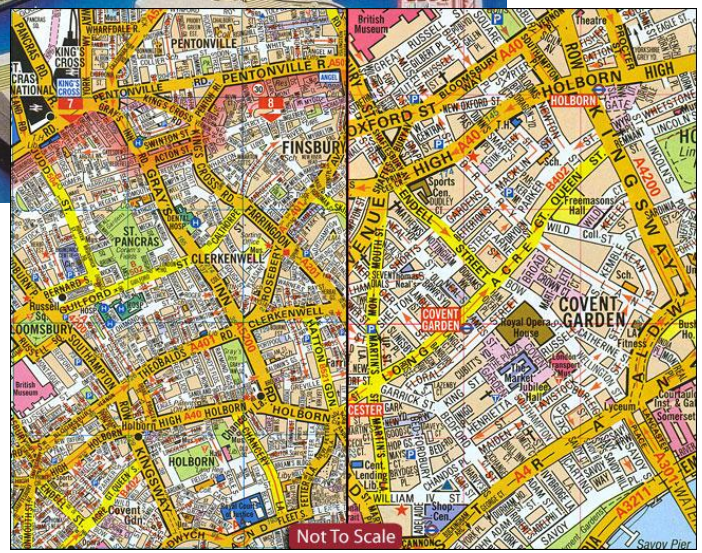
Keywords Iron deficiency • Heart failure • Energy metabolism • Extracellular flux analysis • ^{31}P-Magnetic resonance spectroscopy

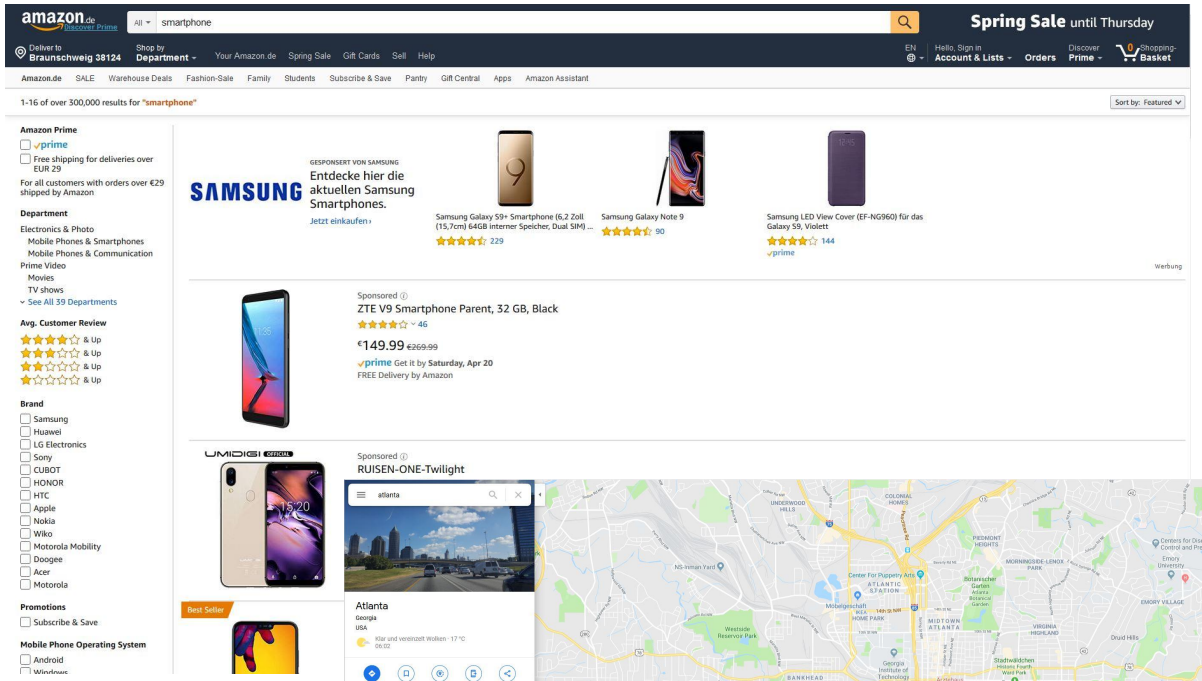
*Corresponding author: Tel: +49 (0)511 532-2229, Fax: +49 (0)511 532-3357, Email: kempf.tibor@mh-hannover.de

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

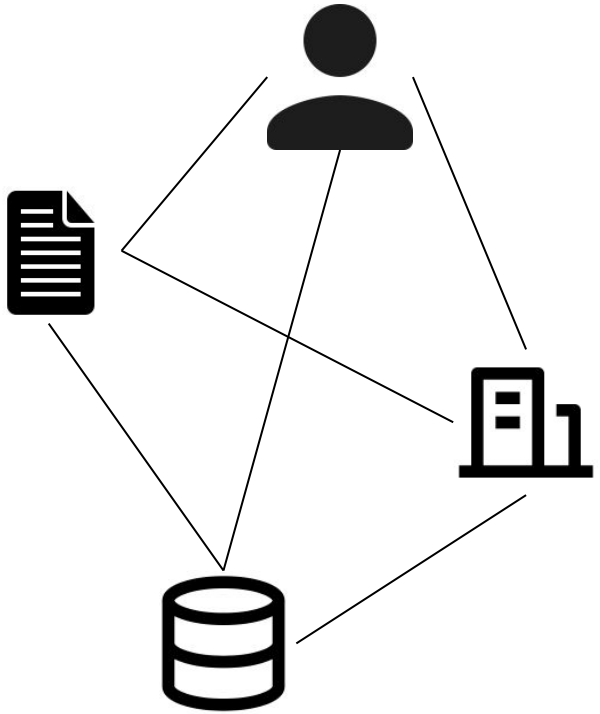
… über fast vier Jahrhunderte

Digitalisierung an anderer Stelle





Ganz so schlimm ist es vielleicht auch nicht



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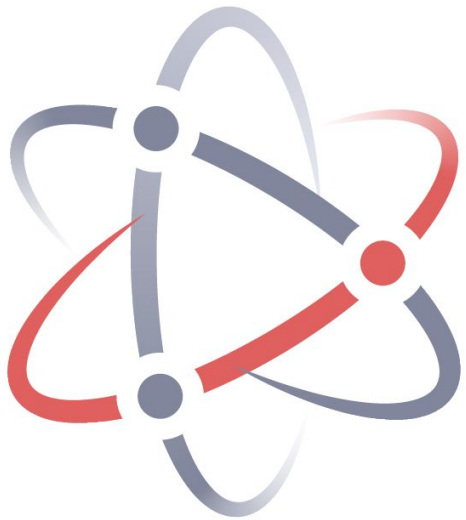

Open Research Knowledge Graph

Open Research Knowledge Graph

- Infrastruktur um Wissen welches in der Literatur kommuniziert wird **maschinenlesbar wissenschaftliches** zu akquirieren, kuratieren, veröffentlichen und prozessieren
- “Tiefe Sacherschließung”: Nicht nur bibliographische Metadaten und mehr als Schlagwörter
- Multimodal mit Crowdsourcing, Text Mining, “semantische” Virtuelle Forschungsumgebungen, usw.
- Wenn Wissen generiert wird, Beitrag geschrieben, eingereicht, veröffentlicht, gelesen wird, usw.
- Öffentliche alpha Version unter https://labs.tib.eu/orkg/
- API Dokumentation unter https://labs.tib.eu/orkg/doc/api/
- Software Open Source und Verfügbar unter https://gitlab.com/TIBHannover/orkg

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Mohamad Yaser Jaradeh

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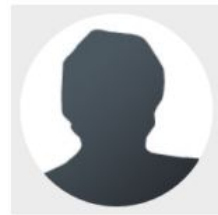
Arthur Brack

PhD Student

Kheir Farfar

Developer



Lars Vogt

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Vitalis Wiens

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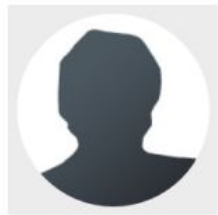

Markus Stocker

Co-Lead

Sören Auer

Lead

Beispiele

Beispiel I

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

BASI

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

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[1]Division of Molecular and Translational Cardiology, Hannover Medical School, Carl-Neuberg-Straße 1, 30625 Hannover, Germany; [2]Department of Card Hannover Medical School, Carl-Neuberg-Straße 1, 30625 Hannover, Germany; [3]European Molecular Biology Laboratory, Meyerhofstraße 1, 69117 Heide [4]Division of Virus-associated Carcinogenesis, German Cancer Research Centre, Im Neuenheimer Feld 280, 69120 Heidelberg, Germany; [5]Department of University of Düsseldorf, Universitätsstraße 1, 40225 Düsseldorf, Germany; [6]Institute of Cell Biology, Hannover Medical School, Carl-Neuberg-Straße 1, Germany; [7]Department of Thoracic and Cardiovascular Surgery, University of Bochum, Georgstraße 11, 32545 Bad Oeynhausen, Germany; [8]Department Pneumology, University of Göttingen, Robert-Koch-Straße 40, 37075 Göttingen, Germany; [9]Department of Analytical Chemistry, Leibniz University Hann 30167 Hannover, Germany; and [10]Institute of Clinical Pharmacology, Hannover Medical School, Carl-Neuberg-Straße 1, 30625 Hannover, Germany

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)

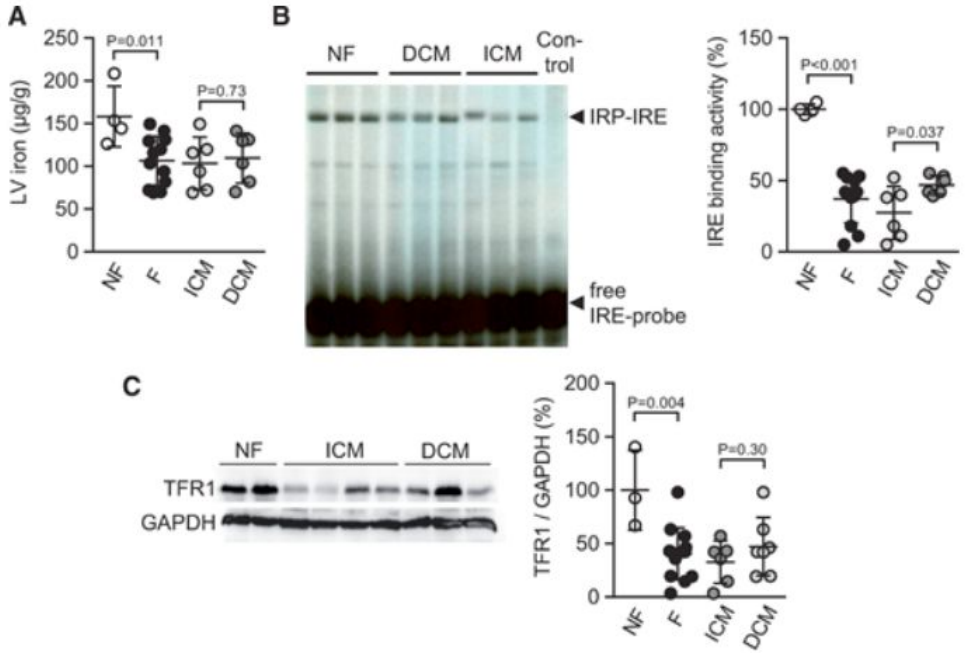
http://doi.org/10.1093/eurheartj/ehw333

Results

Reduced iron content, IRE binding activity, and transferrin receptor expression in the failing human heart

Consistent with previous reports,[5,6] iron concentration was significantly lower in LV tissue samples from patients with advanced heart failure than in LV tissue samples from unused donor hearts (*Figure1A*). As shown by electrophoretic mobility shift assays, IRE binding activity was significantly reduced in failing hearts (most pronounced in patients with ischemic cardiomyopathy) (*Figure1B*). Protein expression levels of the transferrin receptor were significantly lower in failing hearts than in the controls (*Figure1C*).

Figure 1



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orkg.ipynb

Code Python 3

In [2]:
```
labels = ['non-failing heart', 'failing heart']
data = [(99, 52),
        (96, 40),
        (100, 38),
        (105, 18),
        (np.nan, 11),
        (np.nan, 5),
        (np.nan, 42),
        (np.nan, 55),
        (np.nan, 53),
        (np.nan, 39),
        (np.nan, 42),
        (np.nan, 50)]

d = pd.DataFrame.from_records(data, columns=labels)
t = ttest_ind(d['non-failing heart'],
              d['failing heart'],
              equal_var=False, nan_policy='omit')

store(represent(d, t))

t.pvalue
```

Out[2]: 1.3111247517411591e-08

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Add paper

1 General — 2 Research field — 3 Contributions — 4 Finish

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Publication date: August 2016

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Specify research contributions

Contribution 1

+ Add another contribution

Research problems

Iron deficiency in heart failure patients

Contribution data

No values

+ Add property

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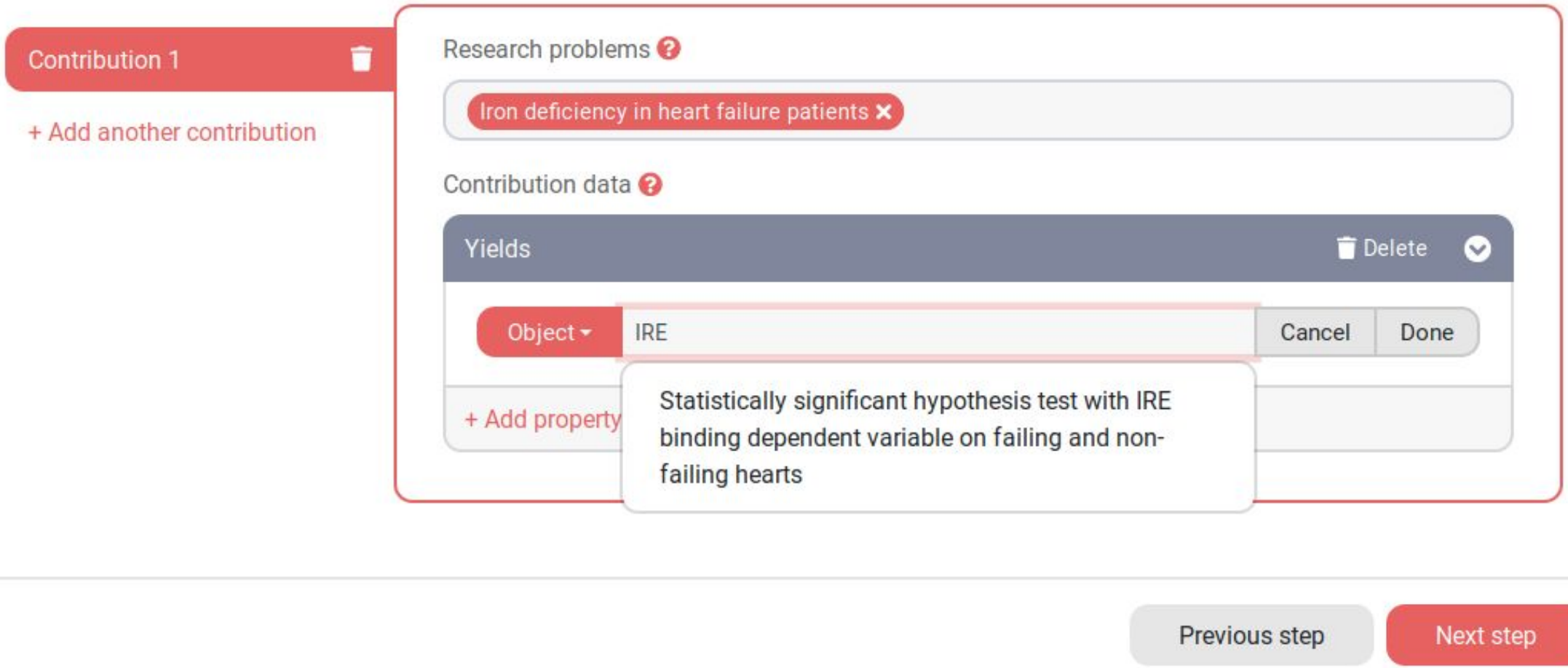

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Iron-regulatory proteins secure iron availability in cardiomyocytes to prevent heart failure

August 2016 Cellular and Molecular Physiology Saba Haddad Yong Wang Bruno Galy Mortimer Korf-Klingebiel Valentin Hirsch Abdul M. Baru Fatemeh Rostami Marc R. Reboll Jörg Heineke Ulrich Flögel Stephanie Groos André Renner Karl Toischer Fabian Zimmermann Stefan Engeli Jens Jordan Johann Bauersachs Matthias W. Hentze Kai C. Wollert Tibor Kempf

Contribution 1

Research problems

Iron deficiency in heart failure patients

Contribution data

Yields: *Statistically significant hypothesis test with IRE binding dependent variable on failing and non-failing hearts*

Similar contributions

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80 %	Wiles's proof of Fermat's last theorem
54 %	Gruber's design of ontologies
14 %	Design criteria for ontologies

Research problems

Add to comparison

Iron deficiency in heart failure patients

Contribution data

← Back | Ma | Statistically significant hypothesis test with IRE binding dependent variable on failin

- Has specified output: *the p-value of the statistical hypothesis test*
- Type: *two sample t-test with unequal variance*
- Has specified input: *LSUC Dataset*
- Label: *Statistically significant hypothesis test with IRE binding dependent variable on failing and non-failing hearts*

View dataset: LSUC Dataset

Showing 24 observations :

Options

left ventricular tissue sample	iron-responsive element binding activity
Search...	Search...
non-failing heart	nan
non-failing heart	99.0
non-failing heart	nan
failing heart	11.0
non-failing heart	nan
non-failing heart	nan
failing heart	42.0
non-failing heart	nan
non-failing heart	96.0
non-failing heart	nan

Previous | Page 1 of 3 | 10 rows | Next

Has specified output: *the p-value of the statistical hypothesis test*

Type: *two sample t-test with unequal variance*

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LSUC Dataset

Label: *Statistically significant hypothesis test with IRE binding dependent variable on failing and non-failing hearts*

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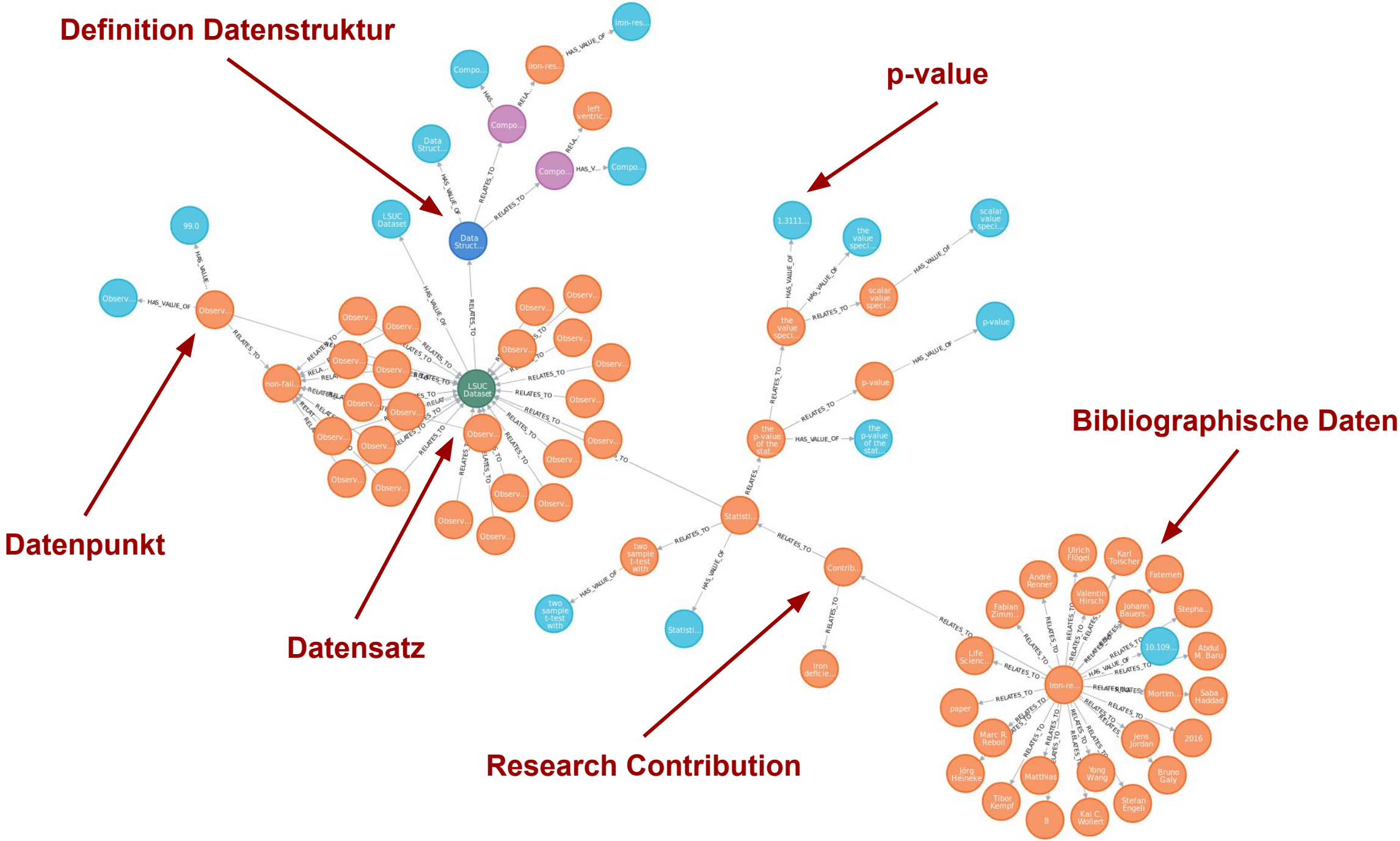
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Beispiel II

Atmos. Chem. Phys., 7, 355–376, 2007
www.atmos-chem-phys.net/7/355/2007/

Nucleation and growth of n

A. Hamed[1], J. Joutsensaari[2], S. Mikkonen[1], L.
M. C. Facchini[4], S. Decesari[4], M. Mircea[4], K. F

[1]Department of Physics, University of Kuopio, P.O
[2]Department of Environmental Sciences, Universi
[3]Division of Atmospheric Sciences, Department o
[4]Inst. di Scienze dell'Atmosfera e del Clima – CNR, Italy Via Gobetti 101, 40 129 Bologna, Italy
[5]Finnish Meteorological Institute, Kuopio Unit, P.O. Box 1627, 70210 Kuopio, Finland
[6]Finnish Meteorological Institute, P.O. Box 503, 00101 Helsinki, Finland

Received: 12 July 2006 – Published in Atmos. Chem. Phys. Discuss.: 5 October 2006
Revised: 13 December 2006 – Accepted: 12 January 2007 – Published: 23 January 2007

https://doi.org/10.5194/acp-7-355-2007

Table 3. Monthly means of event start time, event end times, event duration, Sunrise and Sunset for nucleation events from (2002–2005) together with the Minimum (Min), Maximum (Max), Mean and Median for the whole study period.
Note that the September month is not statistically reliable.

Month	Event start time	Event end time	Duration	Sunrise	Sunset
1	10:29	16:53	06:23	07:50	16:53
2	12:17	18:41	06:23	07:21	17:33
3	11:14	17:18	06:04	06:30	18:14
4	11:30	16:50	05:20	05:34	18:52
5	10:21	15:31	05:09	04:50	19:29
6	9:05	14:51	05:46	04:34	19:53
7	9:43	14:25	04:41	04:50	19:48
8	9:57	15:37	05:40	05:24	19:10
9	11:00	16:27	05:27	06:01	18:15
10	11:57	17:37	05:40	06:39	17:18
11	12:05	18:30	06:24	07:19	16:38
12	12:03	18:35	06:32	07:49	16:29
Min	09:05	14:25	04:41	04:34	16:29
Max	12:17	18:41	06:32	07:50	19:53
Mean	10:58	16:46	05:47	06:13	18:12
Median	11:07	16:51	05:43	06:15	18:14

Beispiel II

Month	Event start time	Event end time	Duration	Sunrise	Sunset
1	10:29	16:53	06:23	07:50	16:53
2	12:17	18:41	06:23	07:21	17:33
3	11:14	17:18	06:04	06:30	18:14
4	11:30	16:50	05:20	05:34	18:52
5	10:21	15:31	05:09	04:50	19:29
6	9:05	14:51	05:46	04:34	19:53
7	9:43	14:25	04:41	04:50	19:48
8	9:57	15:37	05:40	05:24	19:10
9	11:00	16:27	05:27	06:01	18:15
10	11:57	17:37	05:40	06:39	17:18
11	12:05	18:30	06:24	07:19	16:38
12	12:03	18:35	06:32	07:49	16:29
Min	09:05	14:25	04:41	04:34	16:29
Max	12:17	18:41	06:32	07:50	19:53
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Nucleation and growth of new particles in Po Valley, Italy

A. Hamed, J. Joutsensaari, S. Mikkonen, L. Sogacheva, M. Dal Maso, M. Kulmala, F. Cavalli, S. Fuzzi, M. C. Facchini, S. Decesari, M. Mircea, K. E. J. Lehtinen, A. Laaksonen

Atmos. Chem. Phys., 7(2):355-376, 2007
https://doi.org/10.5194/acp-7-355-2007

Results

Table 1. Monthly means of event start time, event end times, event duration, Sunrise and Sunset for nucleation events from (2002–2005) together with the Minimum (Min), Maximum (Max), Mean and Median for the whole study period. Note that the September month is not statistically reliable.

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9	11:00	16:27	05:27	06:01	18:15
10	11:57	17:37	05:40	06:39	17:18
11	12:05	18:30	06:24	07:19	16:38
12	12:03	18:35	06:32	07:49	16:29
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https://doi.org/10.5194/acp-7-355-2007

Results

Table 1. Monthly means of event start time, event end times, event duration, Sunrise and Sunset for nucleation events from (2002–2005) together with the Minimum (Min), Maximum (Max), Mean and Median for the whole study period. Note that the September month is not statistically reliable.

Month	Event start time	Event end time	Duration	Sunrise	Sunset
1	10:29	16:53	06:23	07:50	16:53
2	12:17	18:41	06:23	07:21	17:33
3	11:14	17:18	06:04	06:30	18:14
4	11:30	16:50	05:20	05:34	18:52
5	10:21	15:31	05:09	04:50	19:29
6	9:05	14:51	05:46	04:34	19:53
7	9:43	14:25	04:41	04:50	19:48
8	9:57	15:37	05:40	05:24	19:10
9	11:00	16:27	05:27	06:01	18:15
10	11:57	17:37	05:40	06:39	17:18
11	12:05	18:30	06:24	07:19	16:38
12	12:03	18:35	06:32	07:49	16:29
Min	09:05	14:25	04:41	04:34	16:29
Max	12:17	18:41	06:32	07:50	19:53
Mean	10:58	16:46	05:47	06:13	18:12
Median	11:07	16:51	05:43	06:15	18:14

```
<span property="dc:creator" typeof="foaf:Person">
    <a href="https://orcid.org/0000-0003-3464-7825" property="vivo:orcidId">
        <span property="foaf:givenname">M.</span>
        <span property="foaf:family_name">Kulmala</span>
    </a>
</span>
```

```
<span property="dc:isPartOf" typeof="bibo:Journal">
    <span property="dc:title"><em>Atmos. Chem. Phys.</em></span>
</span>,
<span property="bibo:volume">7</span>
(<span property="bibo:issue">2</span>)
:<span property="bibo:pageStart">355</span>
-<span property="bibo:pageEnd">376</span>
, <span property="dc:date">2007</span>
```

```
<a about="https://doi.org/10.5194/acp-7-355-2007"
href="https://doi.org/10.5194/acp-7-355-2007" property="bibo:doi">
    https://doi.org/10.5194/acp-7-355-2007
</a>
```

Nucleation and growth of new particles in Po Valley, Italy

View graph

2007 | Environmental Sciences | A. Laaksonen | L. Sogacheva | K. E. J. Lehtinen | M. Dal Maso | F. Cavalli | J. Joutsensaari | M. Kulmala | S. Decesari | S. Mikkonen | M. Mircea | A. Hamed | M. C. Facchini | S. Fuzzi

DOI: 10.5194/acp-7-355-2007

Contribution 1

Research problems

Add to comparison

Temporal characteristics of nucleation events

Contribution data

Yields

ESUC dataset

View dataset: ESUC dataset

Showing 16 observations :

Options

Month	Event start time	Event end time	Duration	Sunrise	Sunset
Search...	Search...	Search...	Search...	Search...	Search...
1	10:29	16:53	06:23	07:50	16:53
2	12:17	18:41	06:23	07:21	17:33
3	11:14	17:18	06:04	06:30	18:14
4	11:30	16:50	05:20	05:34	18:52
5	10:21	15:31	05:09	04:50	19:29
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Mean	10:58	16:46	05:47	06:13	18:12
Median	11:07	16:51	05:43	06:15	18:14
Min	09:05	14:25	04:41	04:34	16:29

Previous

Page 1 of 1

20 rows

Next

Was wird ermöglicht?

Alle Beiträge (Titel, DOI, und p-value) die das Problem “Iron deficiency in heart failure patients” angehen und eine Art t-test Statistik durchführen mit einem Datensatz N > 3.

```
MATCH
(:Resource {resource_id: 'R10'})<-[:RELATES_TO {predicate_id: 'P3'}]-(paper:Resource)
-[:RELATES_TO {predicate_id: 'P31'}]->(contribution)-[:RELATES_TO {predicate_id: 'P32'}]->(problem:Resource)
MATCH (type:Resource {label: 'two sample t-test with unequal variance'})
<-[:RELATES_TO {predicate_id: 'P50'}]-(result)<-[:RELATES_TO]-(contribution) // type label is a variable
MATCH (result)-[:RELATES_TO {predicate_id: 'P58'}]->(dataset)<-[:RELATES_TO {predicate_id: 'P41'}]
-(observation)-[:HAS_VALUE_OF {label:'R537'}]->() //This R537 is a replacement for IRE binding and could be a variable
MATCH (result)-[:RELATES_TO]->(pvalue:Resource)-[:RELATES_TO {predicate_id: 'P50'}]->(:Resource {label: 'p-value'}) // This is a variable
MATCH (pvalue)-[:RELATES_TO]->(:Resource)-[:HAS_VALUE_OF {predicate_id: 'P59'}]-(value:Literal)
MATCH (paper)-[:HAS_VALUE_OF {predicate_id: 'P26'}]->(doi:Literal)
WITH COUNT(observation) AS freq, problem, dataset, paper, doi, value
WHERE problem.label = 'Iron deficiency in heart failure patients' // This is a variable
AND
'C5' in labels(dataset) //This is the class of qb:Dataset
AND
freq > 3 // This is a variable
RETURN paper.label AS title, doi.label AS doi, value.label AS pvalue
```

title	doi	pvalue
"Iron-regulatory proteins secure iron availability in cardiomyocytes to prevent heart failure"	"10.1093/eurheartj/ehw333"	"1.3111247517411591e-08"

Research problems

Add to comparison

Sorting algorithms

Contribution data

Implementation: *Custom implementaion*

Method: *Merging*

Stable: *Y*

Best complexity: *n log n*

Worst complexity: *n log n*

Similar contributions

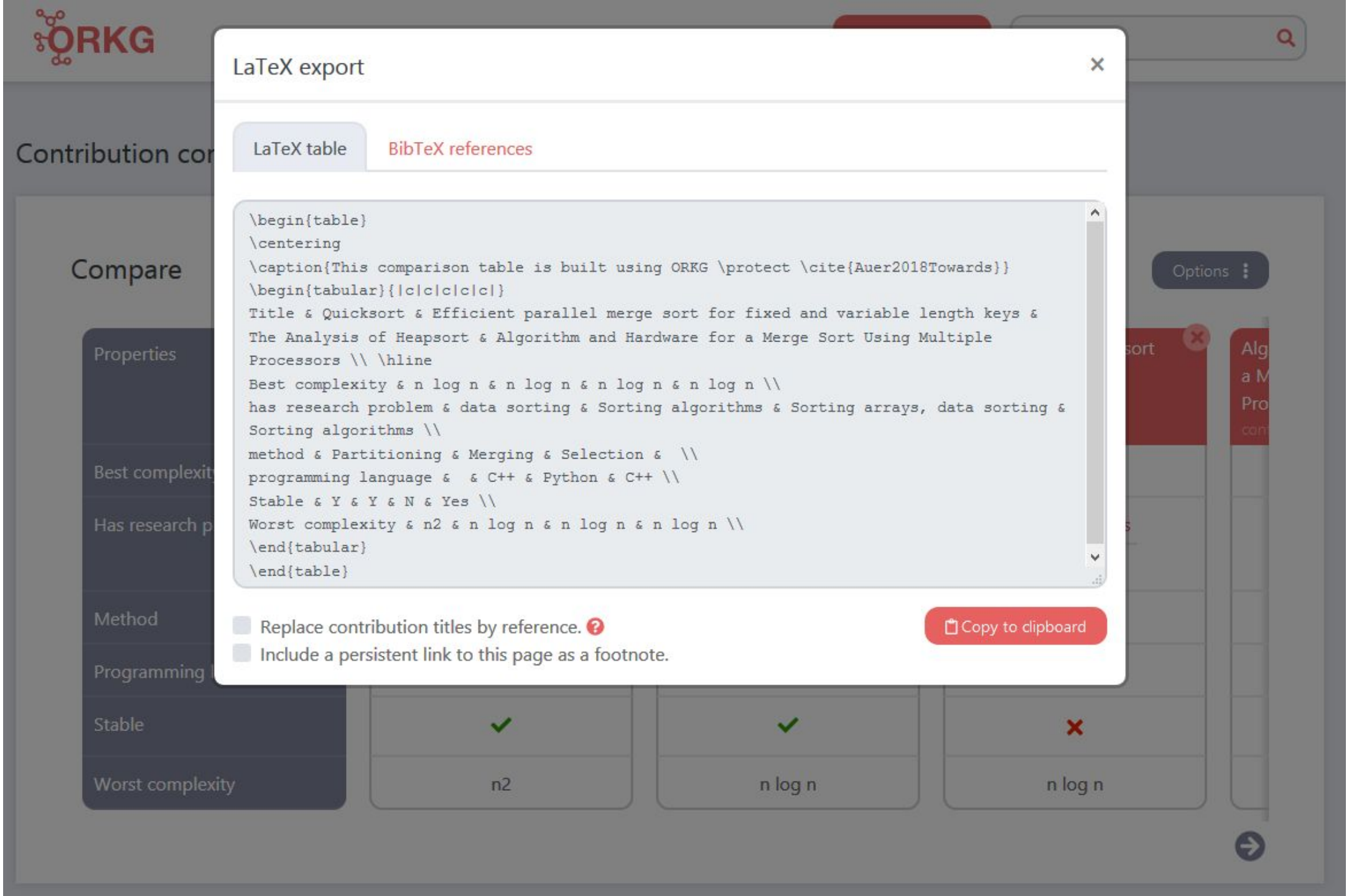
61 %	Algorithm and Hardware for a Merge Sort Using Multiple Processors	
59 %	The Analysis of Heapsort	
57 %	Quicksort	

Compare these contributions

Compare

Options

Properties	Quicksort Contribution 1	Efficient parallel merge sort for fixed and variable length keys Contribution 1	The Analysis of Heapsort Contribution 1	Alg a M Pro con
Best complexity	n log n	n log n	n log n	
Has research problem	data sorting	Sorting algorithms	Sorting arrays data sorting	
Method	Partitioning	Merging	Selection	
Programming language	*Empty*	C++	Python	
Stable	✔	✔	✖	
Worst complexity	n2	n log n	n log n	


ORKG
Contribution cor
Compare
Options
Properties
Best complexit
Has research p
Method
Programming
Stable
Worst complexity
n2
n log n
n log n
LaTeX export
LaTeX table
BibTeX references
\begin{table}
\centering
\caption{This comparison table is built using ORKG \protect \cite{Auer2018Towards}}
\begin{tabular}{|c|c|c|c|c|}
Title & Quicksort & Efficient parallel merge sort for fixed and variable length keys &
The Analysis of Heapsort & Algorithm and Hardware for a Merge Sort Using Multiple
Processors \\ \hline
Best complexity & n log n & n log n & n log n & n log n \\
has research problem & data sorting & Sorting algorithms & Sorting arrays, data sorting &
Sorting algorithms \\
method & Partitioning & Merging & Selection & \\
programming language & & C++ & Python & C++ \\
Stable & Y & Y & N & Yes \\
Worst complexity & n2 & n log n & n log n & n log n \\
\end{tabular}
\end{table}
Replace contribution titles by reference.
Include a persistent link to this page as a footnote.
Copy to clipboard

Was kommt als nächstes?

- Editieren und Löschen von existierenden Inhalten, inklusive Versionierung und Provenance
- Benutzermanagement mit Social Login Unterstützung (z.B. ORCID)
- Disziplinspezifisch angepasste “Contribution Data” Formulare
- Inhaltskuratierung und Qualitätssicherung, inklusive Entwicklung notwendiger Tools
- Erweiterung der Use Cases welche die Möglichkeiten in der ganzen Fülle aufzeigen
- Integrationen mit
  - Disziplinspezifische Terminologie
  - Verlagen und Online Journal Management Systems (z.B. Open Journal Systems)
  - Bibliotheken und Fachreferent*innen
  - Anderen Open Science Graph Projekte und Systeme (z.B. OpenAIRE, PID Graph, usw.)
  - NFDI, FID, EOSC, etc.
  - NFDIs, FIDs, EOSC, usw.

Demo

https://labs.tib.eu/orkg/paper/R4059