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Elsevier Research Intelligence

Research Data and Analysis: Focus on Economic Development Metrics

University-Industry Demonstration Partnership

6 October 2016

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Director of Solution Services
Research Intelligence, Elsevier

Empowering Knowledge

Grand Challenges Are Multidisciplinary and Global

Climate Change

Energy

Aging Populations

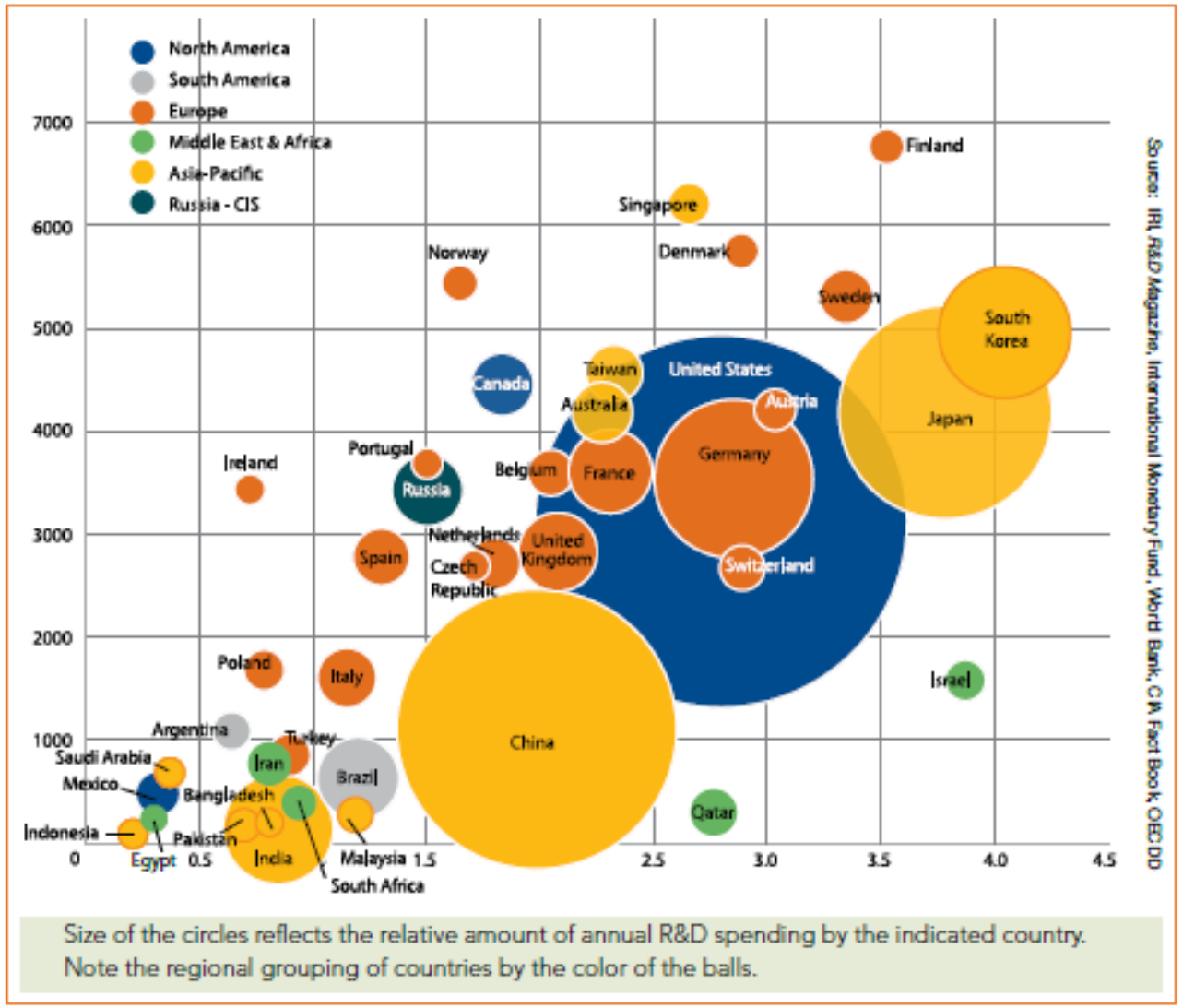
Poverty Reduction

Cybersecurity

Food and Water Security

Environment

2015 Global R&D Expenditures



Size of the circles reflects the relative amount of annual R&D spending by the indicated country. Note the regional grouping of countries by the color of the balls.

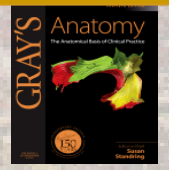
- The world as a whole spent over $1.88T in R&D in 2015
- In 2015 South Korea spent $74B, 4.0% of its GDP, on R&D. It now spends more than any EU country except Germany, with a much smaller population
- India's investments in R&D were the sixth-highest globally. Three years ago they were the tenth-highest spender.
- US R&D spending in 2015 was up 2.3% over the prior year to $497B, while China's spending rose 7.7% to $372B

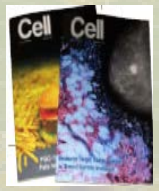
http://www.rdmag.com/articles/2016/03/2016-global-r-d-funding-forecast-predicts-continued-moderate-growth

Elsevier – A Unique Vantage Point on the Global World of Research

Elsevier – From publisher to solution provider

- Serving 30 million+ scientists, students, health and information professionals in 180+ countries
- 2,500 E-journals, 2,000 E-books published each year, dozens of research databases
- RELX (Reed Elsevier), the largest digital company in Europe

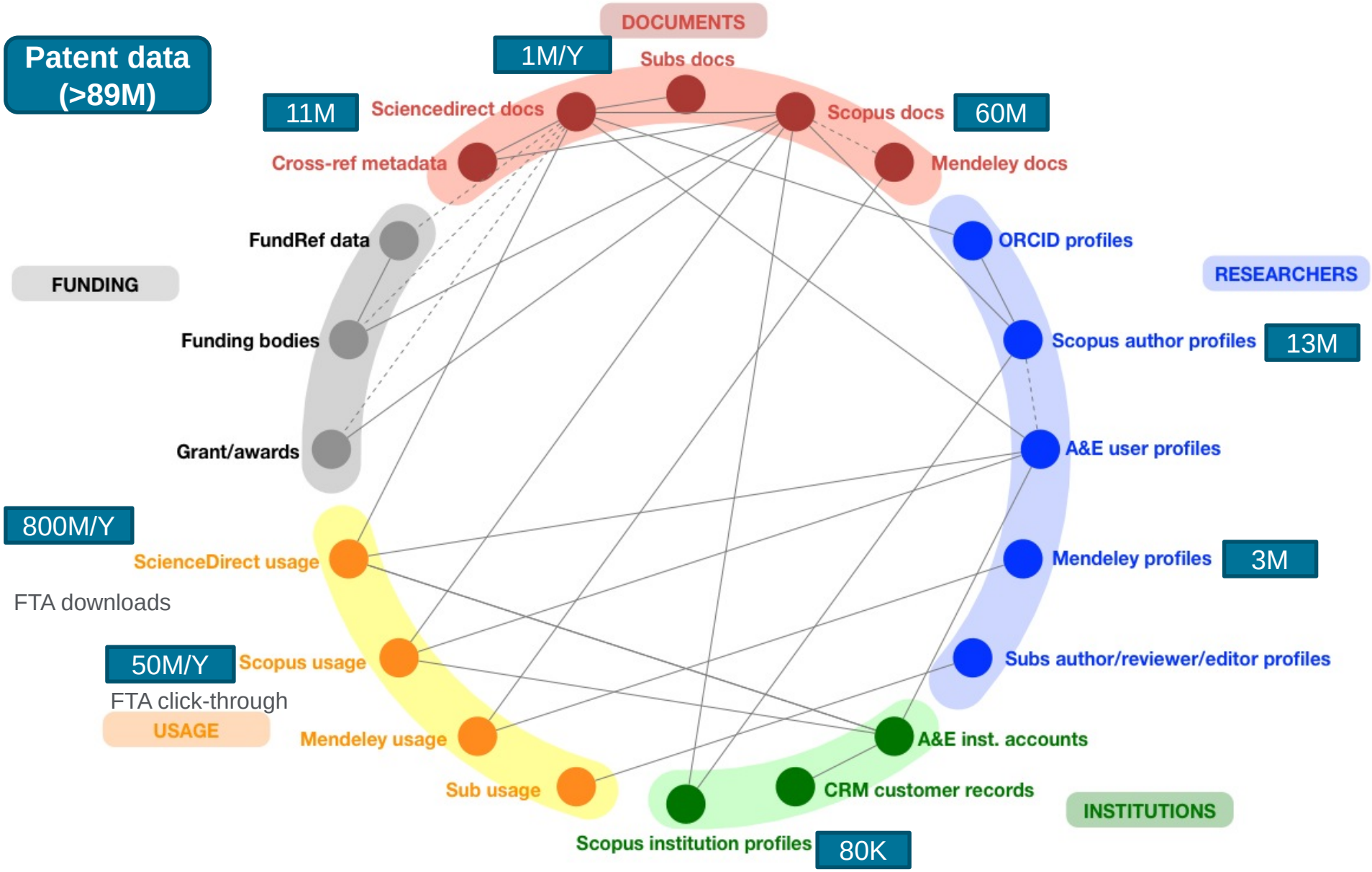




Each year

- 1.2 million manuscripts submitted to 2,500+ Elsevier journals
- 300,000+ articles published
- 800 million digital article downloads delivered
- 22,000+ journals, >2 million articles per year tracked by Scopus (>60M articles in total)
- Terabytes of data in Elsevier Research Intelligence suite

What Data Do We Bring to the Table?



Amsterdam as Knowledge Hub vs. 10 Comparator Cities

- All pubs from Amsterdam and 10 other metro-area universities co-authored with industry
- Initial analysis showed Amsterdam has comparative advantage vs. peers in biomedical research in terms of overall field-weighted citation impact
- Research Q: How are Amsterdam and peer cities connected to major life sciences and other firms?

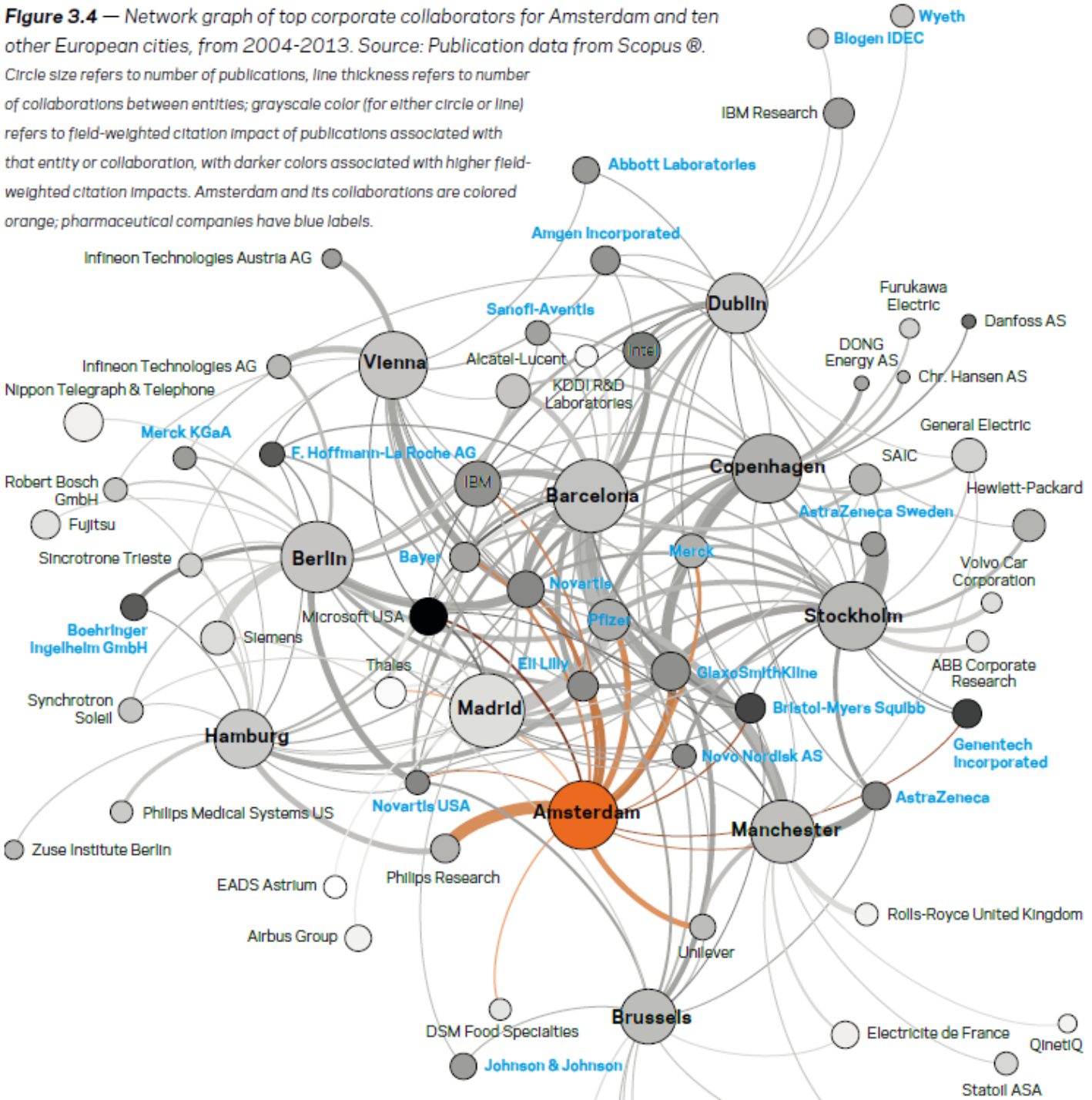


Figure 3.4 *— Network graph of top corporate collaborators for Amsterdam and ten other European cities, from 2004-2013. Source: Publication data from Scopus ®. Circle size refers to number of publications, line thickness refers to number of collaborations between entities; grayscale color (for either circle or line) refers to field-weighted citation impact of publications associated with that entity or collaboration, with darker colors associated with higher field-weighted citation impacts. Amsterdam and its collaborations are colored orange; pharmaceutical companies have blue labels.*

Evaluating UK Research Performance: BIS Report

See: https://www.gov.uk/government/publications/performance-of-the-uk-research-base-international-comparison-2013

BIS Report: Quantitative Inputs

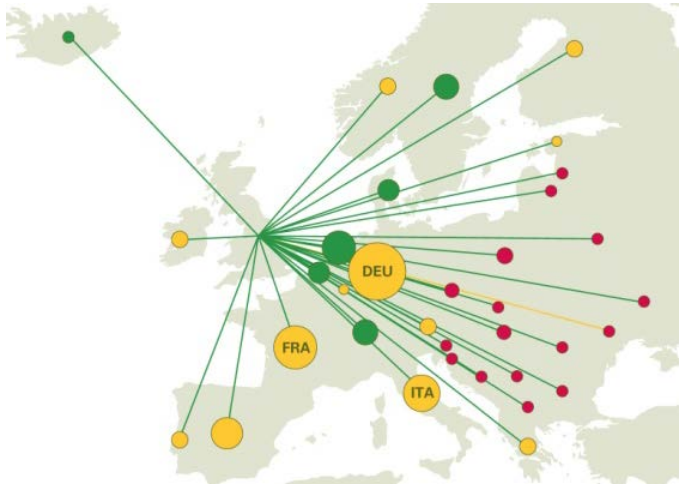
Data

- Scopus
- ScienceDirect usage
- OECD
- HESA
- WIPO
- AUTM
- HEFCE

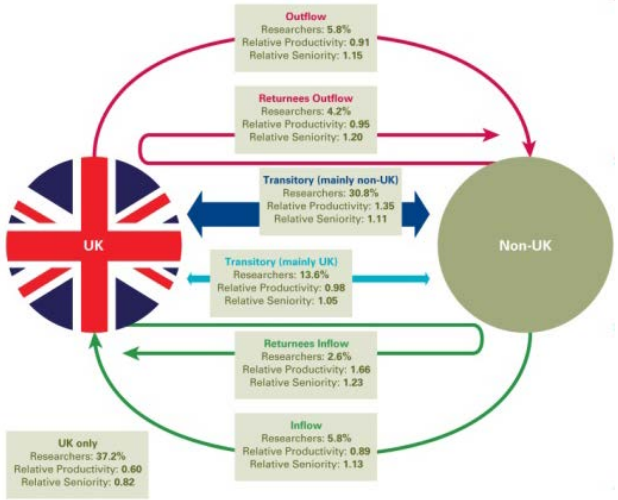
- 112 database tables, 2.3 Gigabytes
- 20MM+ articles, 200MM+ citations, 3B downloads
- 45MM indicator values
- Largest indicator: 6MM+ values

Analyses

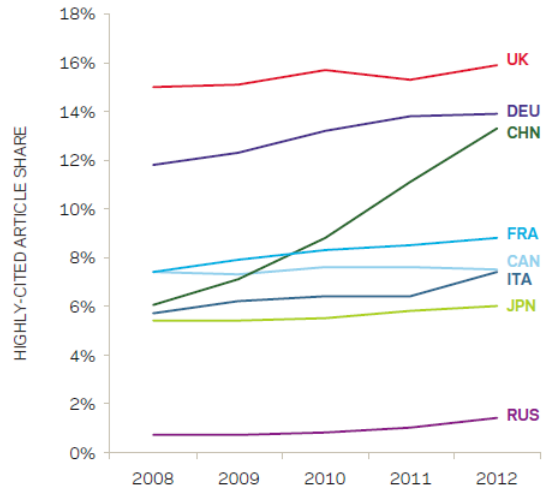
Collaboration networks



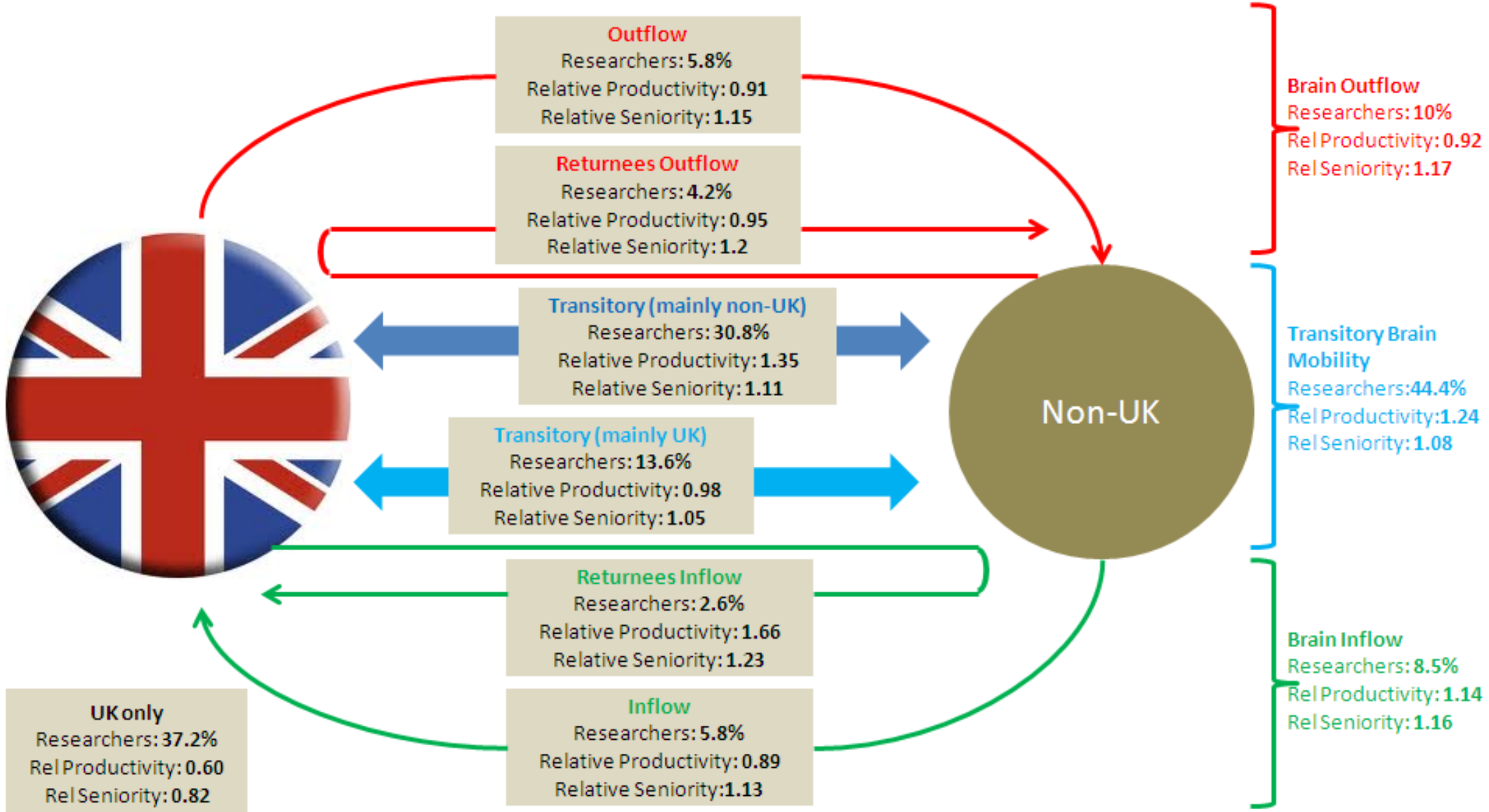
Brain Circulation



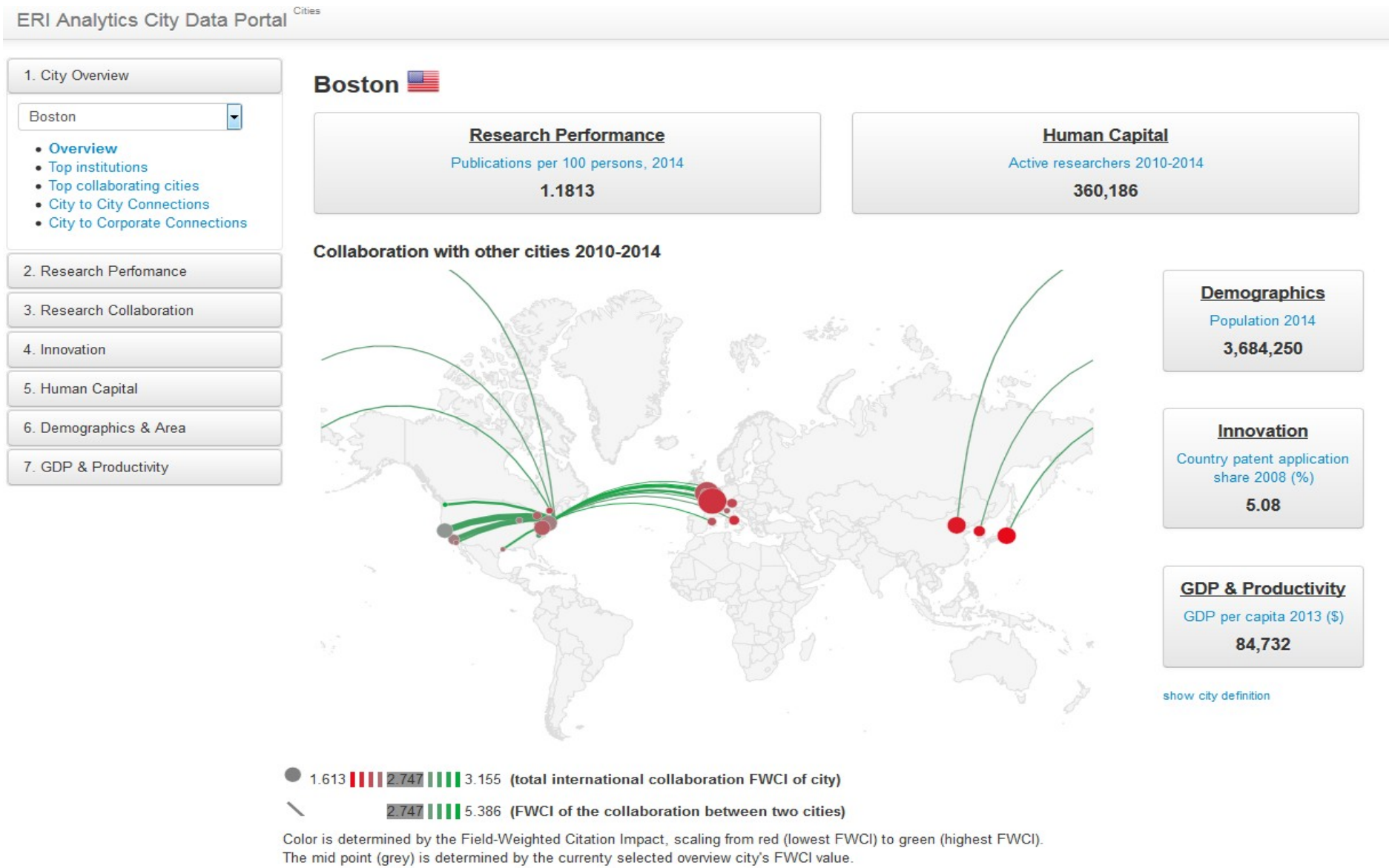
Highly-Cited Articles (ex. US)



Monitoring brain circulation—UK map



City Portal – Comparative Analysis of Top 50 Global Research Cities



http://cityportal.scivalanalytics.com/report/view/theme/2/indicator/4/output/chart/

Traditional Impact Metrics – Citation and Publication Metrics

Harvard University

2nd (QS) · 6th (THE) · 1st (ARWU) | United States | More details on this Institution

View data sources | 2011 to 2015 | no subject area filter selected | ASJC

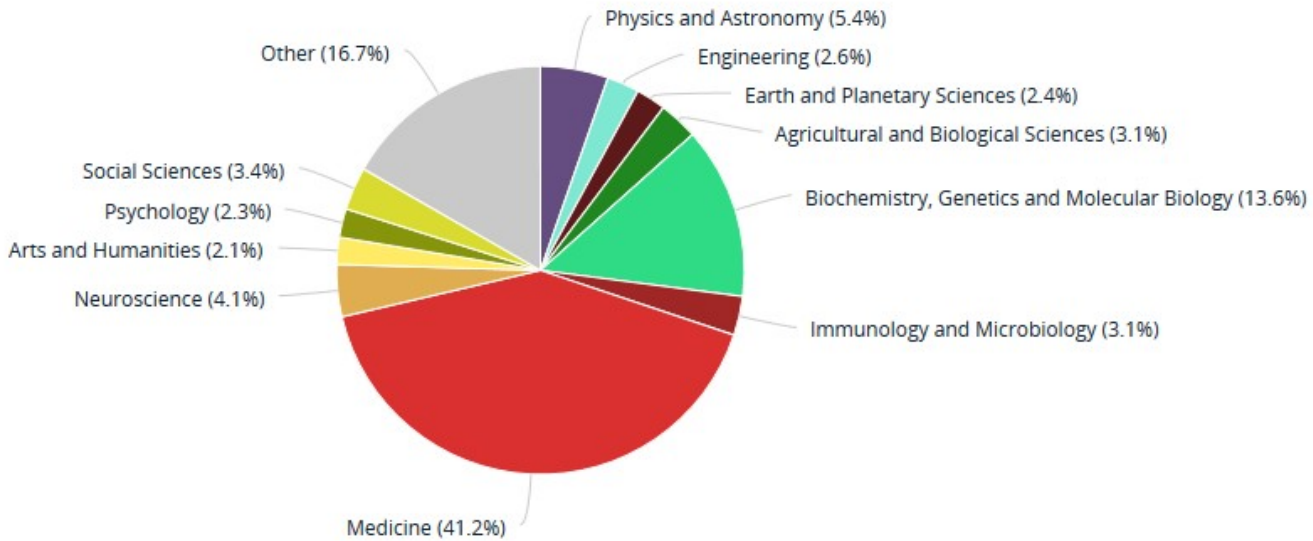
Summary | Collaboration | Published | Viewed | Cited | Economic Impact | Authors | Competencies

Overall research performance

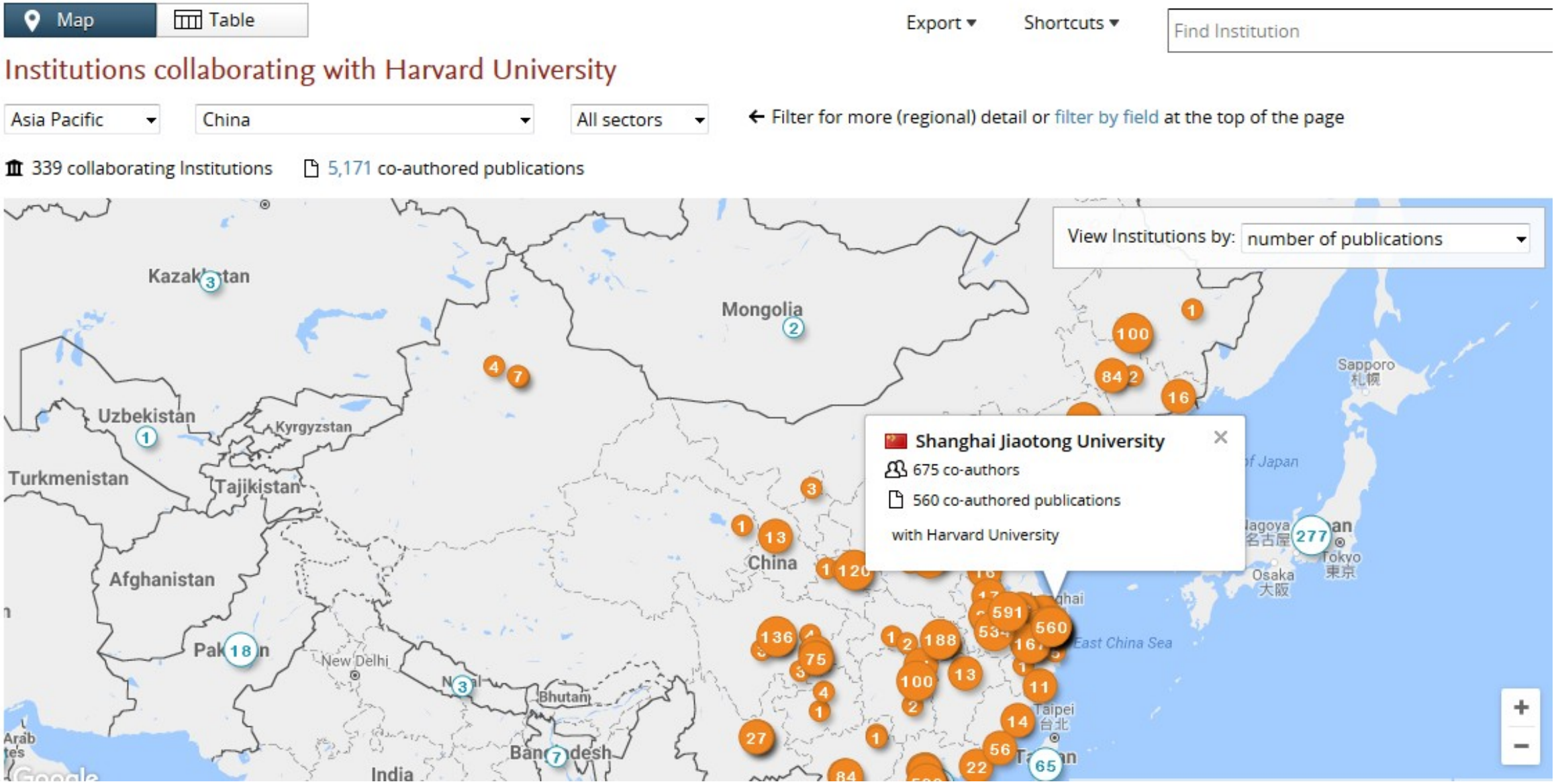
Download page as PDF | Export

Publications	Citations	Authors	Field-Weighted Citation Impact	Citations per Publication
130,916 ▲	2,070,452	71,119 ▲	2.39	15.8

View list of publications



Institutional Collaboration Patterns: Harvard Global Co-Authorship Network



Institutional Collaboration Patterns: Harvard Global Co-Authorship Network

Collaboration with Shanghai Jiaotong University

Year range: 2011 to 2015

Export ▾ Shortcuts ▾

Overview | Current co-authors | Potential co-authors

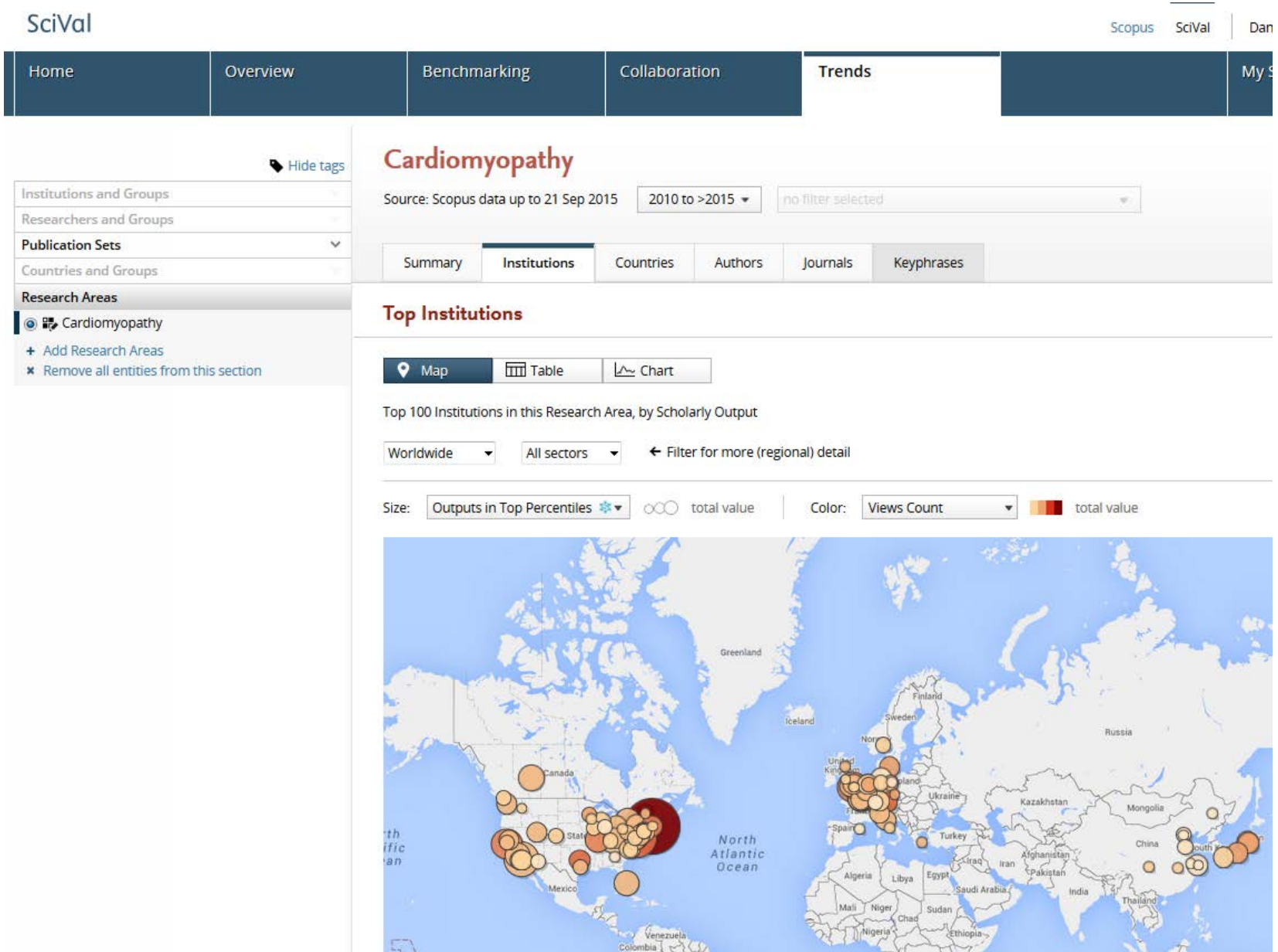
	Harvard University	Co-authored	Shanghai Jiaotong University
	865 ▲ co-authors with Shanghai Jiaotong University	560 ▲ publications	675 ▲ co-authors with Harvard University
	2.39 Field-Weighted Citation Impact	6.41 Field-Weighted Citation Impact	1.12 Field-Weighted Citation Impact
Authors	71,119 ▲	-	48,844 ▲
Scholarly Output	130,916 ▲	-	57,093 ▲
Views count (from Scopus)	2,095,086	41,577	777,491
Field-Weighted Views Impact	1.32	8.01	1.01
Citation Count	2,070,452	21,642	338,170

Show all

Co-authored publications by Subject Area

Pie chart | Bar chart

Custom Research Areas--Usage Data – Heat Map of Abstract Downloads by Originating Institution



Economic Impact and Collaboration Metrics – University-Industry Co-Authorship

Institutions collaborating with Harvard University

Worldwide | Corporate | reset filter

272 collaborating Institutions | 4,925 co-authored publications

Institution	Co-authored publications	Co-authors at Harvard University	Co-authors at the other Institution	Field-Weighted C...	Field-Weighted View...
GlaxoSmithKline	284	649 ▲	492 ▲	8.80	3.36
Novartis USA	283 ▲	887 ▲	491 ▲	5.73	2.10
Pfizer	281 ▼	632 ▼	510 ▲	7.08	2.42
RAND	272 ▲	214 ▲	164 ▲	2.59	1.45
Novartis	237 ▲	618 ▲	514 ▲	7.17	3.01
Merck	230 ▼	607 ▼	413 ▼	5.92	2.66
New England Research Institutes	192 ▼	195 ▼	82 ▲	3.52	1.33
Eli Lilly	176 ▲	352 ▲	223 ▲	7.90	2.79
Genentech Incorporated	172 ▲	405 ▲	207 ▲	13.23	5.00
AstraZeneca	137 ▼	224 ▲	220 ▲	7.00	2.68
Amgen Incorporated	125 ▼	322 ▼	189 ▲	8.24	3.04
Microsoft USA	125 ▲	177 ▼	122 ▼	2.85	0.88

Economic Impact Metrics--Patent Citations per 1000 publications by Institution

Patent-Citations per Scholarly Output

8.4

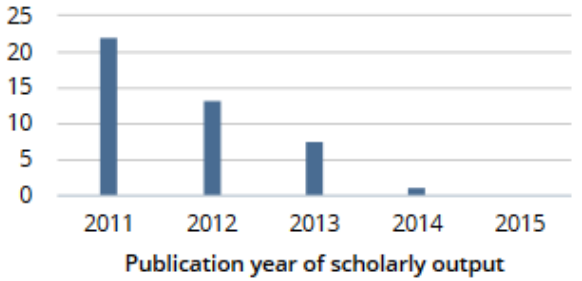
average patent-citations received per 1,000 scholarly outputs published by National Taiwan University

Patent-Citations per Scholarly Output

5.2

average patent-citations received per 1,000 scholarly outputs published by Tsinghua University

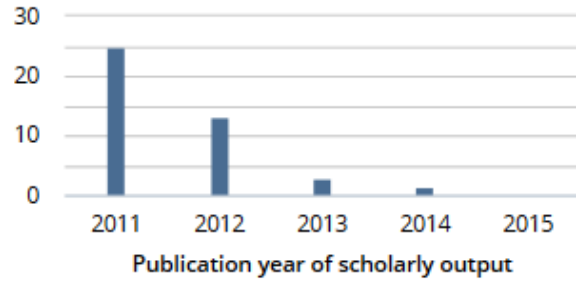
Patent-Citations per Scholarly Output



8.5

average patent-citations received per 1,000 scholarly outputs published by Nanyang Technological University

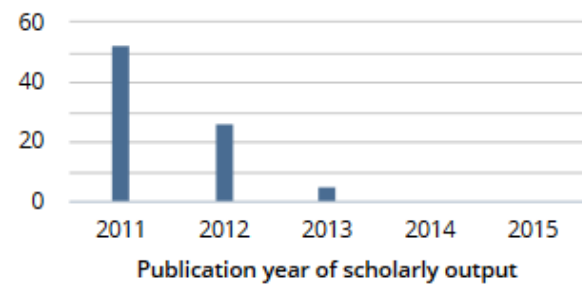
Patent-Citations per Scholarly Output



8.5

average patent-citations received per 1,000 scholarly outputs published by the University of Tokyo

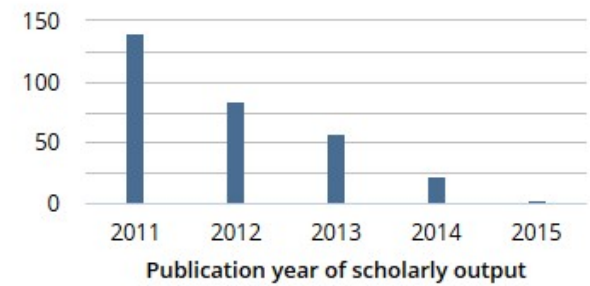
Patent-Citations per Scholarly Output



16.7

average patent-citations received per 1,000 scholarly outputs published by the Korea Advanced Institute of Science and Technology

Patent-Citations per Scholarly Output

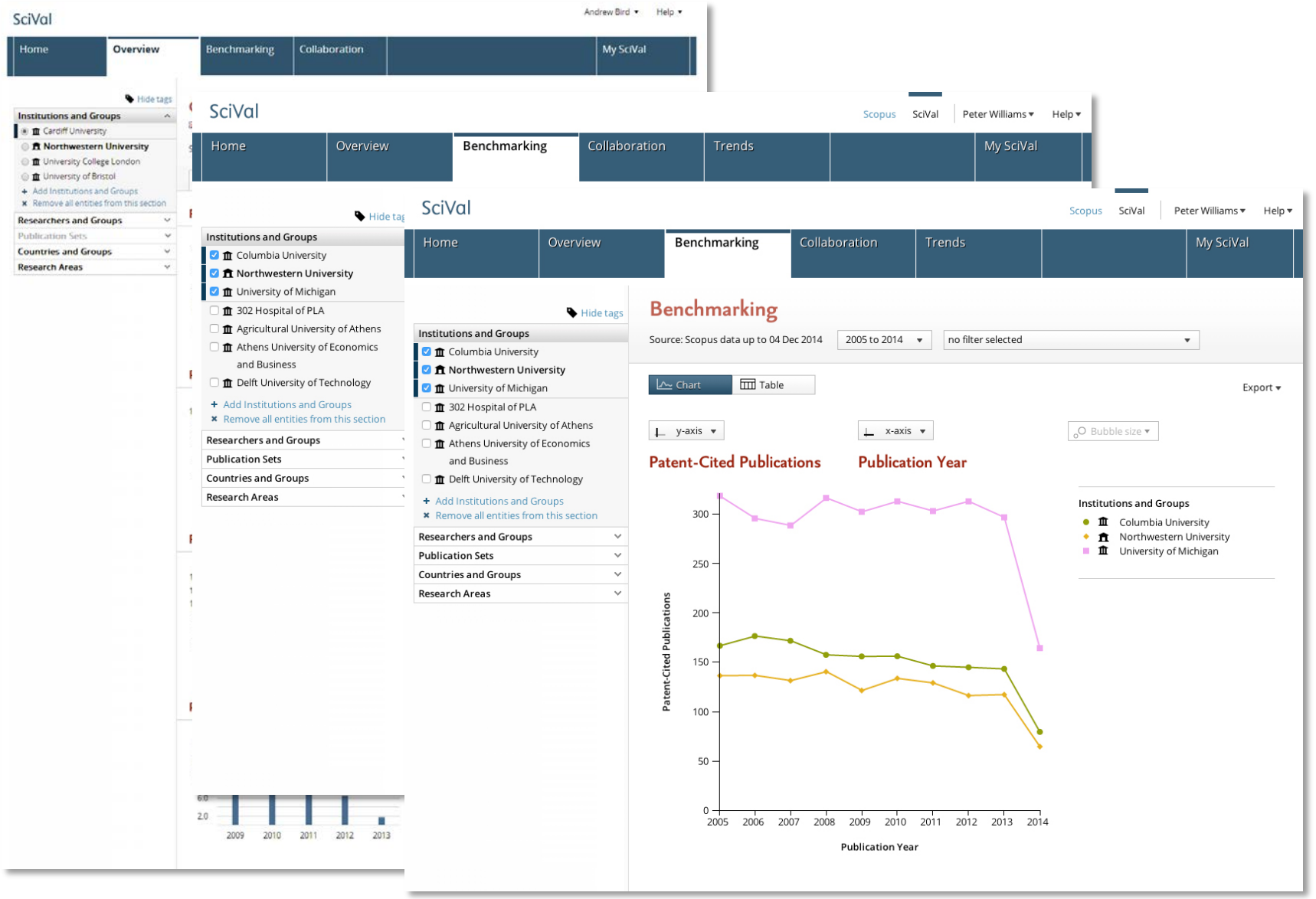


59.1

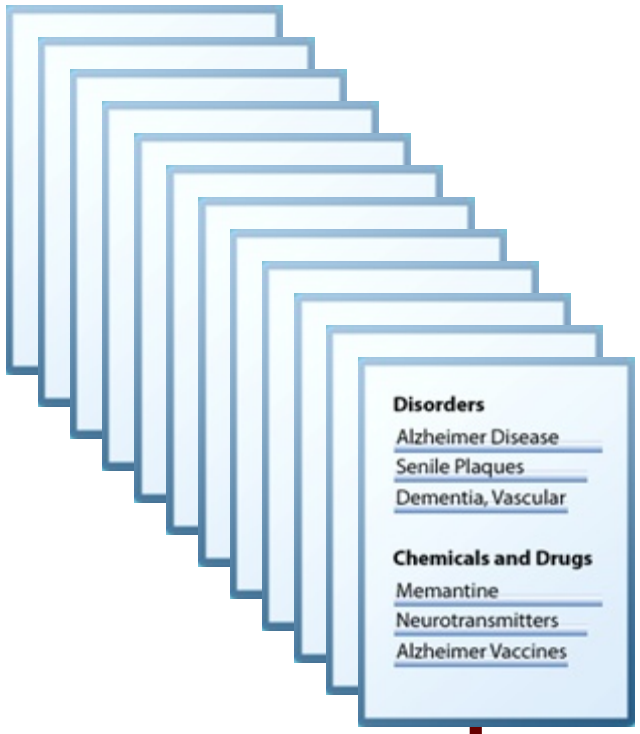
average patent-citations received per 1,000 scholarly outputs published by Harvard University

Learn more about this metric ↗

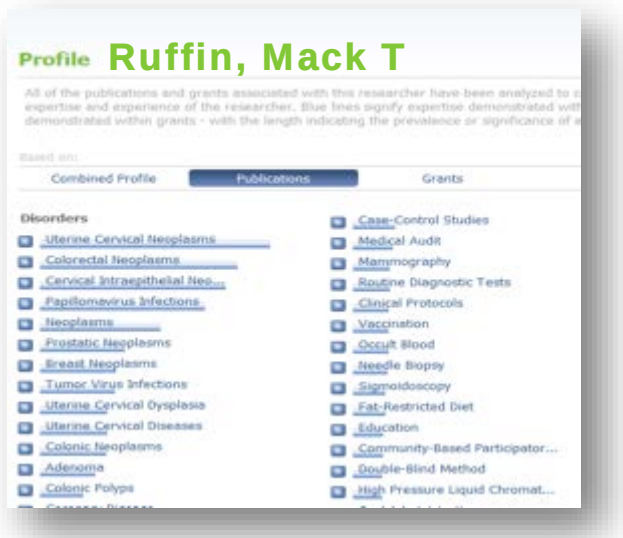
Economic Impact Metrics – Patent-Cited Publications



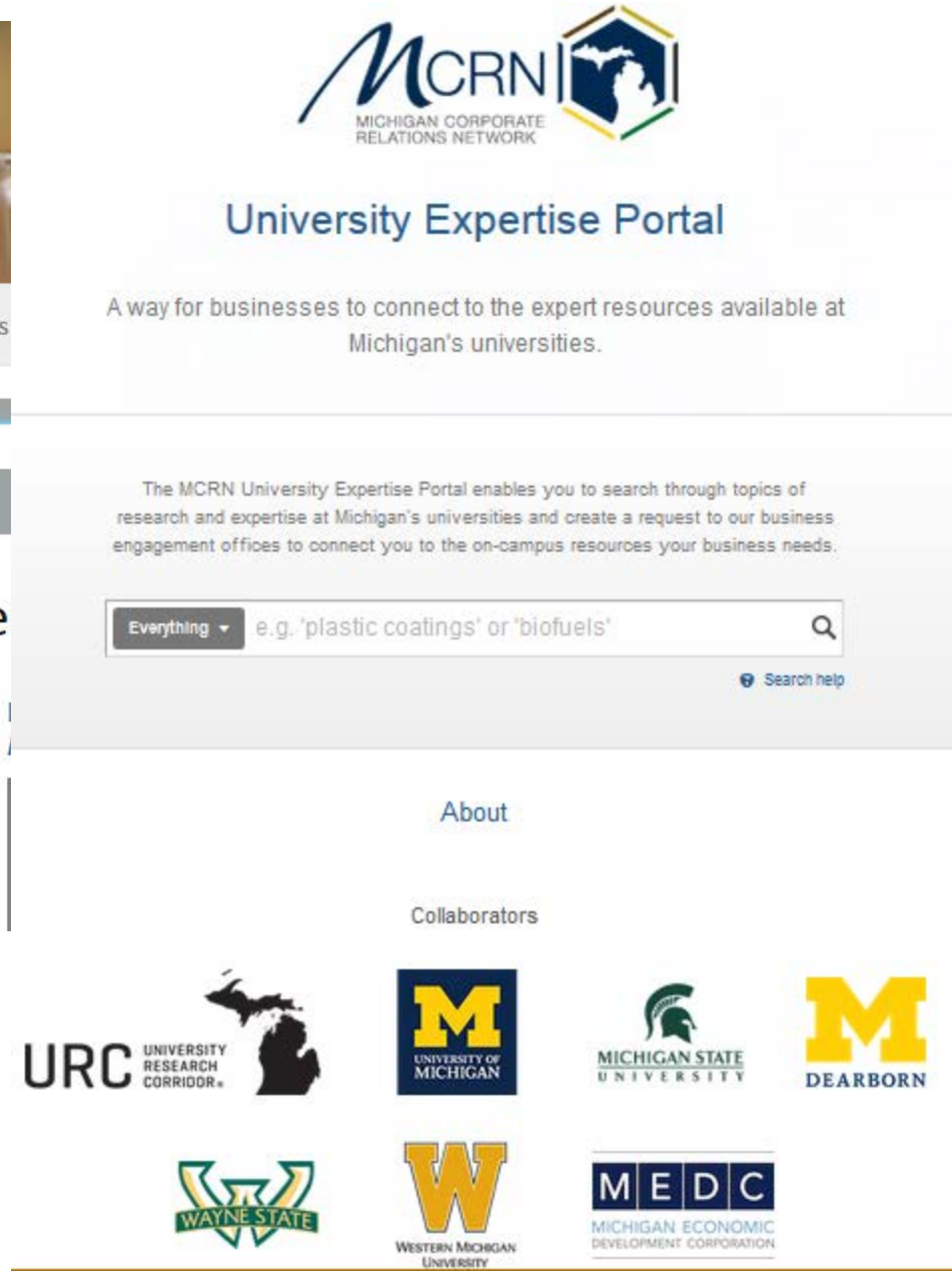
Semantic and NLP Technology--Elsevier Fingerprint Engine



Using advanced semantic technologies and natural language processing, we can generate a researcher's unique Fingerprint by aggregating the Fingerprints of each of their publication abstracts

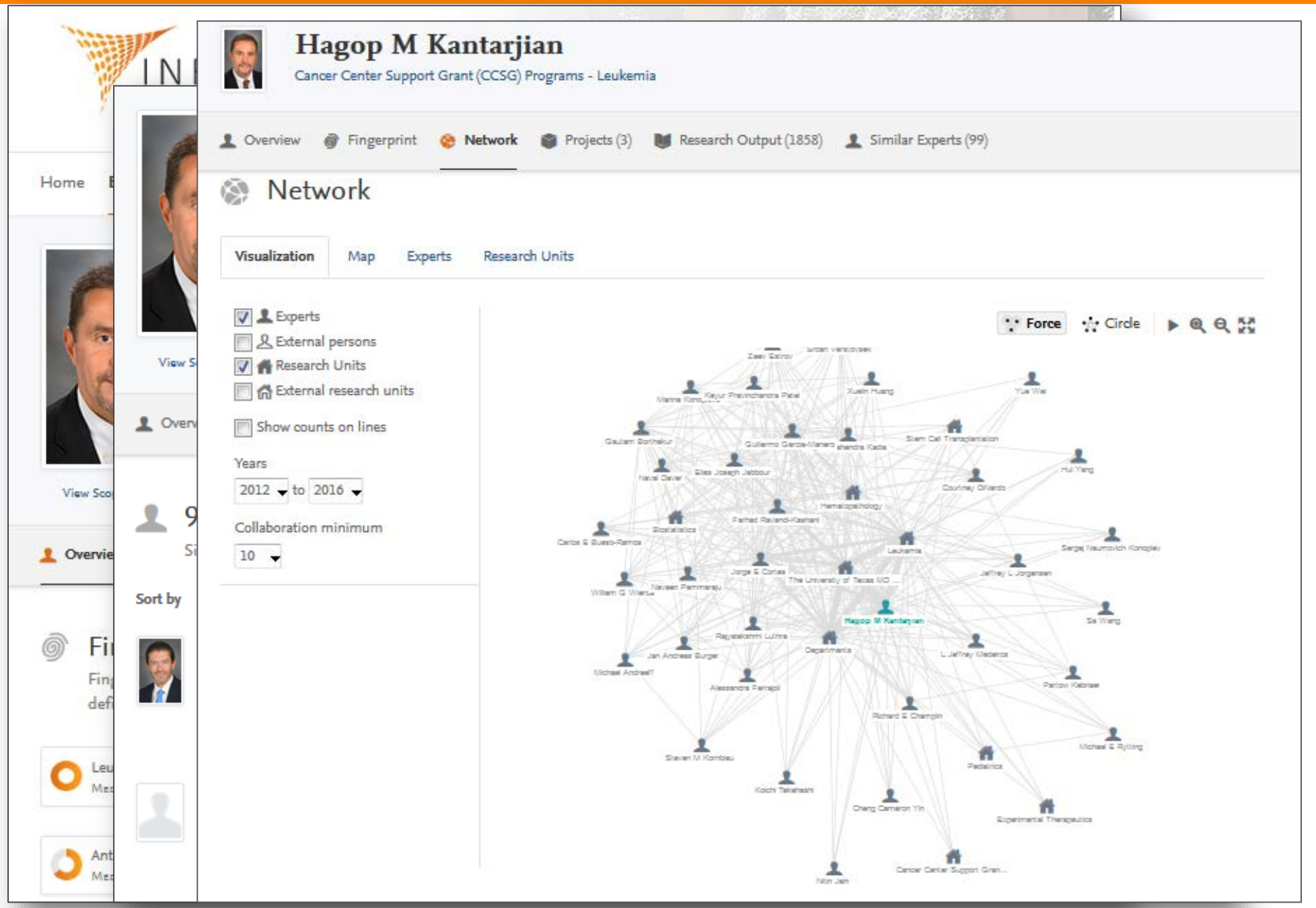


Pure Experts State Portals—Texas and Michigan Systems



http://influuent.utsystem.edu

https://mcrn.pure.elsevier.com/


Hagop M Kantarjian
Cancer Center Support Grant (CCSG) Programs - Leukemia
Overview
Fingerprint
Network
Projects (3)
Research Output (1858)
Similar Experts (99)
Network
Visualization
Map
Experts
Research Units
Experts
External persons
Research Units
External research units
Show counts on lines
Years
2012 to 2016
Collaboration minimum
10
Force
Circle
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Leukemia
Hematopathology
Biostatistics
Stem Cell Transplantation
Pediatrics
Experimental Therapeutics
Sort by