Showcasing your Research Impact using Bibliometrics

An Introduction to Bibliometrics

Ciarán Quinn

Session aims

- What are Bibliometrics?
- What are Altmetrics?
- Why are they important?
- How can you measure?
  - What are the metrics?
  - What resources are available to you?
  - Subscribed and Unsubscribed resources
- How to identify your research impact /profile
- How to improve your citations
  - Where should I publish
  - Using keywords/descriptors
  - Increasing visibility
- Using metrics to identify potential research collaborations

Session aims

What are Bibliometics &Altmetrics?

Why are they important for me?

How to identify your research impact/profile

How do I improve my citations?

Using metrics to identify potential research collaborations

What are Bibliometrics?

- A range of statistical analyses related to publications and their authors.

Beware !

- Each measure has advantages and disadvantages, related to discipline characteristics, inclusiveness of the measures, and the accessibility of the data; and no single measure should be used in isolation.

- There are different emphasis and tools for different groups
  - For example if much of your work feeds into government reports, advisory committees or the media you may not get due credit using traditional metrics alone.

The Metrics

- A variety of metrics have been developed to help assess the output of researchers. Here are some of the most popular:

- **Total number of papers:** a simple count of the number of papers a researcher has published
- **Total number of citations:** a count of all the citations received by a researcher's published works
- **The h-index:** has become the most popular metric for assessing the output of individuals since it was developed by Hirsch in 2005. The h-index of an individual is the number of their papers that have been cited at least *h* times e.g. a researcher has an h-index of 25 if 25 of their papers have been cited at least 25 times.
- A number of **variations on the h-index** have emerged. These include:

- **1)*Egghe's g-index*** which gives more weight to the highest cited papers
- ***2)The individual h-index*** which accounts for co-authorship in calculating impact by giving less weight to such papers
- **3)*The contemporary h-index*** gives less weight to older cited papers
- **4)*The age-weighted citation rate*** which also accounts for the age of papers

Examples of some Bibliometric Indicators

- H Index (Used by WOS Citation Indexes & Scopus Author Evaluator)
  - measures the quantity & sustainability of an individuals research output
- Citation Analysis
  - how many times your publications have been cited on Journal and Citation Indexes such as Scopus and Web of Science
- Journal based metrics and Impact Factors
  - **Journal Citation Reports** (Web of Knowledge)
  - **Eigenfactor (http://www.eigenfactor.org/) (data from JCR)**
  - **Journal Analyzer** (Scopus)

Why are they important?

- Use citation counts & analysis to
  - Assess your own research performance
  - Evaluate and track the impact your published research
  - Identify Journals with the greatest impact in your research area
  - Support applications for promotion, tenure and grant funding
  - Identify potential collaboration opportunities with other researchers
  - Enhance the international reputation of yourself, your department and your Institution by showcasing your citations

Journal Citation Reports by Subject

(Psychology) Sorted by Impact Factor

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2011 JCR Science Edition

Journal Summary List

Journal Title Changes

Journals from: subject categories PSYCHOLOGY | VIEW CATEGORY SUMMARY LIST

Sorted by: Impact Factor | SORT AGAIN

Journals 1 - 20 (of 75)

[1 | 2 | 3 | 4]

Page 1 of 4

MARK ALL | UPDATE MARKED LIST

Ranking is based on your journal and sort selections.

Mark	Rank	Abbreviated Journal Title (linked to journal information)	ISSN	JCR Data						*Eigenfactor*® Metrics	
				Total Cites	Impact Factor	5-Year Impact Factor	Immediacy Index	Articles	Cited Half-life	*Eigenfactor*® Score	*Article Influence*® Score
☐	1	ANNU REV PSYCHOL	0066-4308	9464	16.833	23.274	3.348	23	9.2	0.02575	11.324
☐	2	PSYCHOL BULL	0033-2909	28331	14.457	18.100	1.683	41	>10.0	0.02969	8.095
☐	3	ANNU REV CLIN PSYCHO	1548-5943	1573	9.111	11.287	1.200	20	4.5	0.00830	4.815
☐	4	PSYCHOL REV	0033-295X	19753	7.756	11.010	1.929	28	>10.0	0.02203	5.945
☐	5	PSYCHOTHER PSYCHOSOM	0033-3190	2663	6.284	5.092	1.179	28	7.2	0.00570	1.501
☐	6	PSYCHOL MED	0033-2917	15297	6.159	6.132	0.847	235	8.8	0.03387	2.178
☐	7	SOC COGN AFFECT NEUR	1749-5016	1374	6.132	6.675	1.042	71	3.2	0.00981	2.758
☐	8	J CHILD PSYCHOL PSYC	0021-9630	12042	4.281	6.104	1.306	121	8.4	0.02755	2.300
☐	9	COGNITIVE PSYCHOL	0010-0285	5360	4.273	5.061	0.235	17	>10.0	0.00601	2.850
☐	10	DEPRESS ANXIETY	1091-4269	3467	4.184	3.931	0.555	119	4.4	0.01205	1.288
☐	11	PSYCHOSOM MED	0033-3174	10526	3.968	4.776	0.657	102	8.5	0.01979	1.668
☐	12	HEALTH PSYCHOL	0278-6133	7288	3.873	4.796	0.430	93	9.0	0.01561	1.792
☐	13	NEUROPSYCHOLOGY	0894-4105	4115	3.816	4.063	0.740	77	7.5	0.01023	1.457
☐	14	NEUROBIOL LEARN MEM	1074-7427	4135	3.419	3.687	0.543	129	5.3	0.01396	1.288
☐	15	PSYCHO-ONCOLOGY	1057-9249	5161	3.339	3.992	0.500	156	5.8	0.01423	1.176
☐	16	PSYCHOPHYSIOLOGY	0048-5772	9123	3.290	4.049	0.654	185	>10.0	0.01369	1.357
☐	17	BIOL PSYCHOL	0301-0511	4723	3.225	4.085	0.569	137	5.7	0.01513	1.405
☐	18	J EXP PSYCHOL HUMAN	0096-1523	10323	3.061	3.759	0.408	152	>10.0	0.01616	1.519
☐	19	DEV PSYCHOBIOL	0012-1630	3216	2.977	2.814	0.973	74	9.2	0.00589	0.930
☐	20	INT J EAT DISORDER	0276-3478	6164	2.947	3.347	0.406	106	9.2	0.01038	1.027

Journal Citation Report

(WOS) 'Journal Cell Biology Int'

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Journal: CELL BIOLOGY INTERNATIONAL

Mark	Journal Title	ISSN	Total Cites	Impact Factor	5-Year Impact Factor	Immediacy Index	Citable Items	Cited Half-life	Citing Half-life
☐	CELL BIOL INT	1065-6995	2844	1.482	1.610	0.310	168	5.7	7.8

Cited Journal | Citing Journal | Source Data | Journal Self Cites

CITED JOURNAL DATA | CITING JOURNAL DATA | IMPACT FACTOR TREND | RELATED JOURNALS

Journal Information

Full Journal Title: CELL BIOLOGY INTERNATIONAL
ISO Abbrev. Title: Cell Biol. Int.
JCR Abbrev. Title: CELL BIOL INT
ISSN: 1065-6995
Issues/Year: 12
Language: ENGLISH
Journal Country/Territory: ENGLAND
Publisher: PORTLAND PRESS LTD
Publisher Address: THIRD FLOOR, EAGLE HOUSE, 16 PROCTER STREET, LONDON WC1V 6 NX, ENGLAND
Subject Categories: CELL BIOLOGY SCOPE NOTE | VIEW JOURNAL SUMMARY LIST | VIEW CATEGORY DATA

Journal Rank in Categories: JOURNAL RANKING

Eigenfactor® Metrics
Eigenfactor® Score
0.00682
Article Influence® Score
0.415

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Journal Impact Factor

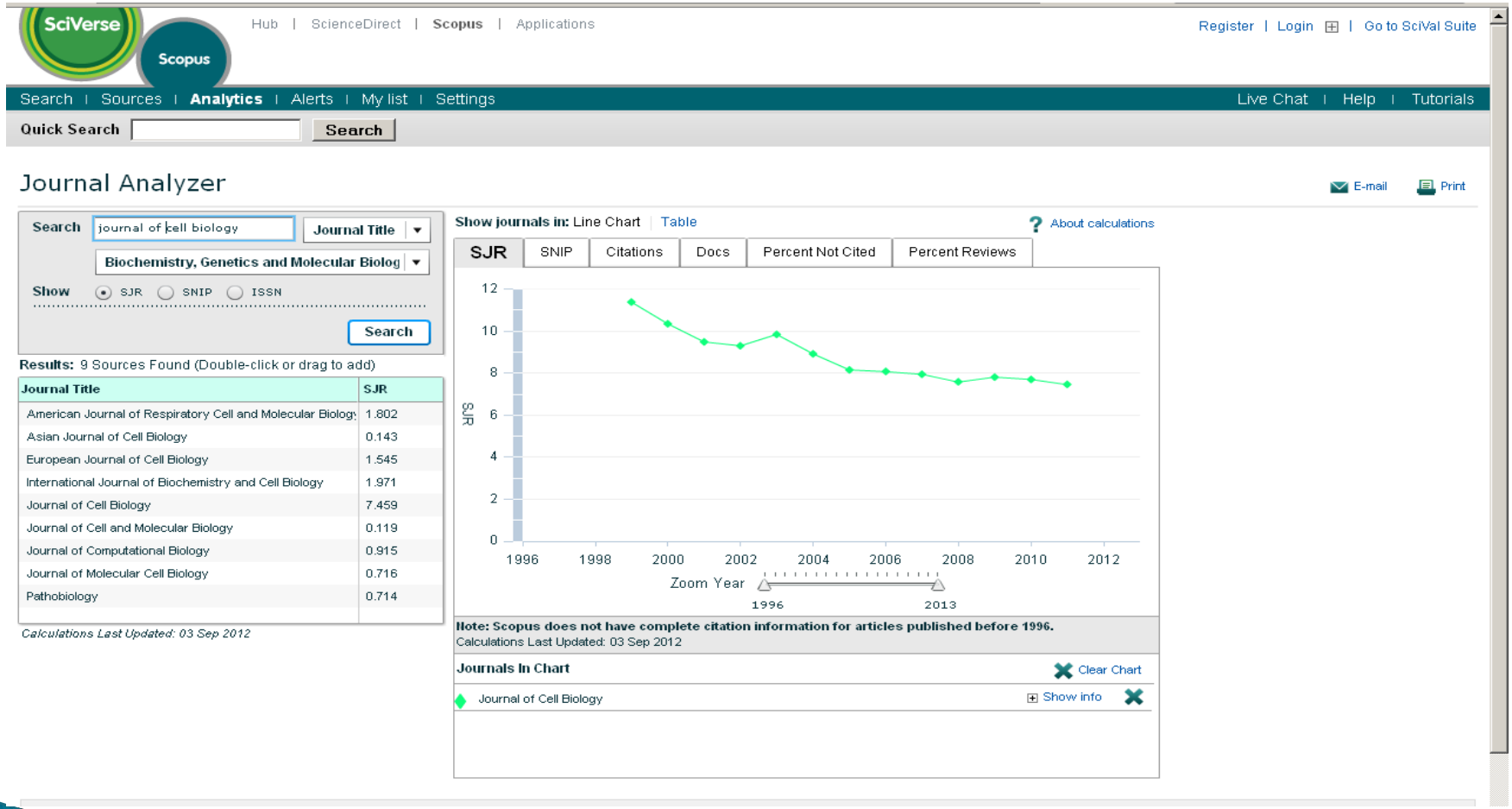
Cites in 2011 to items published in: 2010 = 163, 2009 = 332, Sum: 495
Number of items published in: 2010 = 165, 2009 = 169, Sum: 334

Calculation: Cites to recent items 495 = **1.482**
Number of recent items 334

5-Year Journal Impact Factor

Journal Analyzer

(Scopus) 'Journal of Cell Biology'



Case Study: Author Citation Report

Engler, Adam J (Bio-Engineer)

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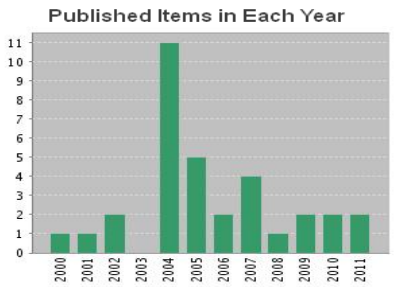
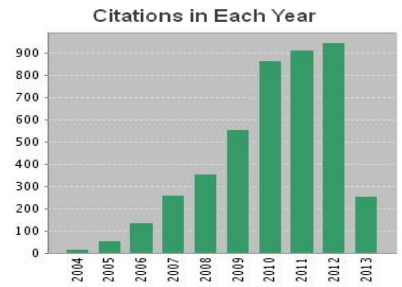
Citation Report Distinct Author Summary: Engler, AJ

Timespan=All years. Databases=SCI-EXPANDED, A&HCI, SSCI.

This report reflects citations to source items indexed within Web of Science. Perform a Cited Reference Search to include citations to items not indexed within Web of Science.





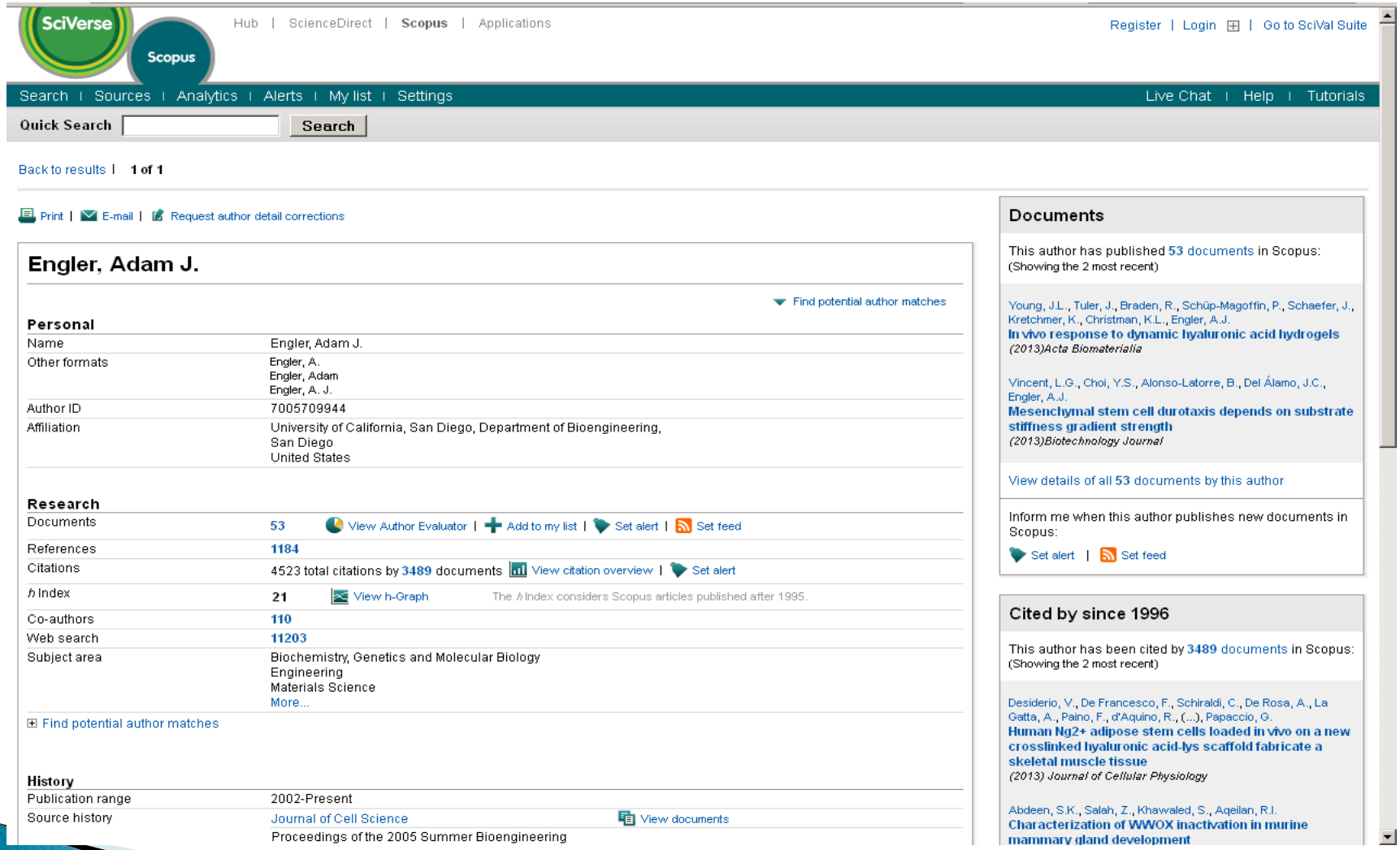
Results found:	33
Sum of the Times Cited [?]:	4351
Sum of Times Cited without self-citations [?]:	4296
Citing Articles [?]:	3286
Citing Articles without self-citations [?]:	3268
Average Citations per Item [?]:	131.85
h-index [?]:	17

Results: 33 — Page 1 of 4 Go — Sort by: Times Cited -- highest to lowest

Use the checkboxes to remove individual items from this Citation Report or restrict to items published between 1945 and 2013 Go

	2009	2010	2011	2012	2013	Total	Average Citations per Year
	554	866	912	944	254	4351	435.10
1. Title: **Matrix elasticity directs stem cell lineage specification** Author(s): Engler, Adam J.; Sen, Shamik; Sweeney, H. Lee; et al. Source: CELL Volume: **126** Issue: **4** Pages: **677-689** DOI: **10.1016/j.cell.2006.06.044** Published: **AUG 25 2006**	322	473	520	515	152	2273	284.12
2. Title: **Myotubes differentiate optimally on substrates with tissue-like stiffness: pathological implications for soft or stiff microenvironments** Author(s): Engler, AJ; Griffin, MA; Sen, S; et al. Source: JOURNAL OF CELL BIOLOGY Volume: **166** Issue: **6** Pages: **877-887** DOI: **10.1083/jcb.200405004** Published: **SEP 13 2004**	63	87	86	83	24	491	49.10
3. Title: **Substrate compliance versus ligand density in cell on gel responses** Author(s): Engler, A; Bacakova, L; Newman, C; et al. Source: BIOPHYSICAL JOURNAL Volume: **86** Issue: **1** Pages: **617-628** DOI: **10.1016/S0006-3495(04)74140-5** Part: **1** Published: **JAN 2004**	47	79	62	56	12	390	39.00
4. Title: **Embryonic cardiomyocytes beat best on a matrix with heart-like elasticity: scar-like rigidity inhibits beating** Author(s): Engler, Adam J.; Carag-Krieger, Christine; Johnson, Colin P.; et al. Source: JOURNAL OF CELL SCIENCE Volume: **121** Issue: **22** Pages: **3794-3802** DOI: **10.1242/jcs.029678** Published: **NOV 15 2008**	21	38	51	41	8	159	26.50

Author Search Scopus



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Engler, Adam J.

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Personal

Name	Engler, Adam J.
Other formats	Engler, A. Engler, Adam Engler, A. J.
Author ID	7005709944
Affiliation	University of California, San Diego, Department of Bioengineering, San Diego United States

Research

Documents	53 View Author Evaluator | Add to my list | Set alert | Set feed
References	1184
Citations	4523 total citations by 3489 documents View citation overview | Set alert
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Web search	11203
Subject area	Biochemistry, Genetics and Molecular Biology Engineering Materials Science More...

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History

Publication range	2002-Present
Source history	Journal of Cell Science View documents Proceedings of the 2005 Summer Bioengineering

Documents

This author has published 53 documents in Scopus:
(Showing the 2 most recent)

Young, J.L., Tuler, J., Braden, R., Schüp-Magoffin, P., Schaefer, J., Kretchmer, K., Christman, K.L., Engler, A.J.
In vivo response to dynamic hyaluronic acid hydrogels
(2013)Acta Biomaterialia

Vincent, L.G., Choi, Y.S., Alonso-Latorre, B., Del Álamo, J.C., Engler, A.J.
Mesenchymal stem cell durotaxis depends on substrate stiffness gradient strength
(2013)Biotechnology Journal

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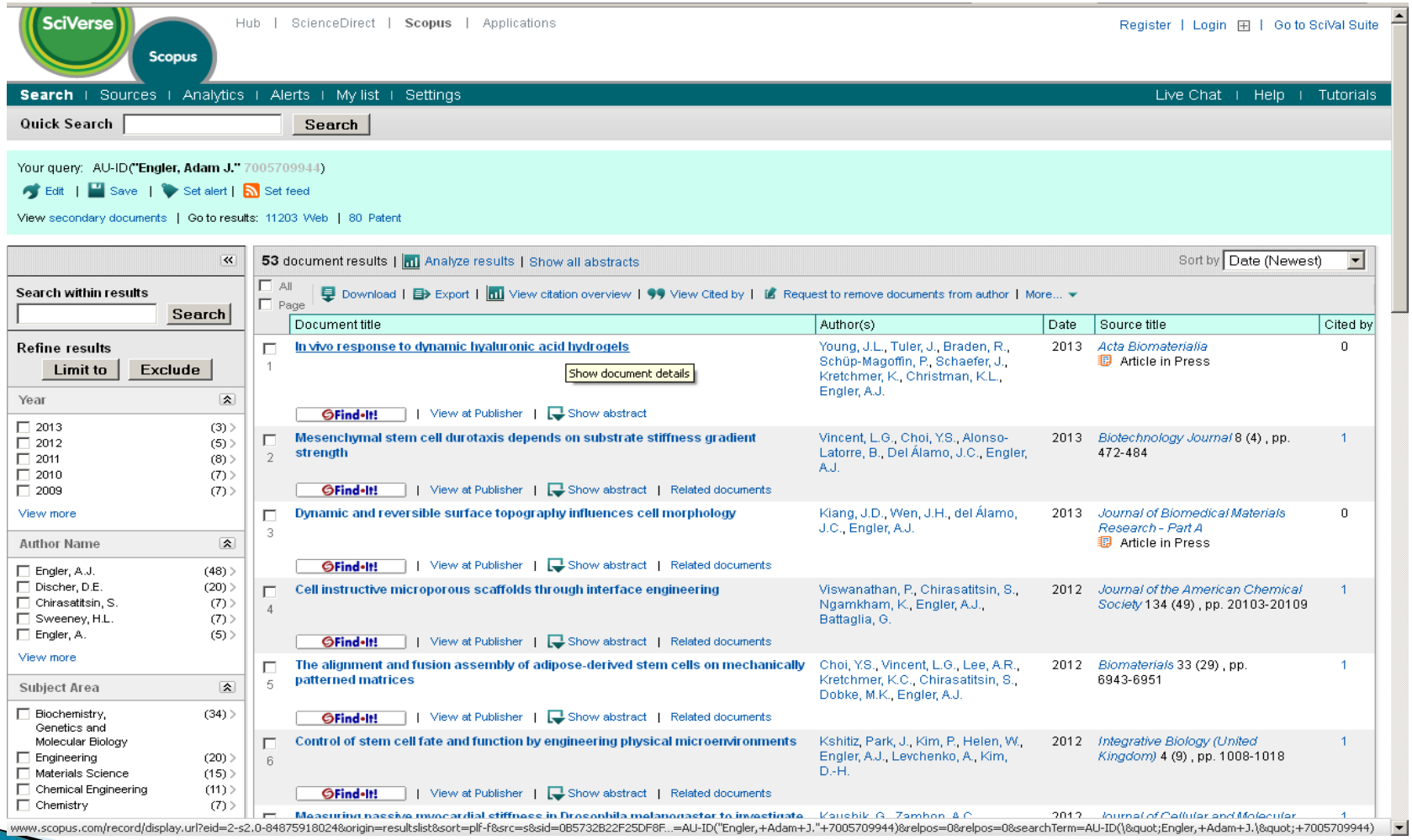
Desiderio, V., De Francesco, F., Schiraldi, C., De Rosa, A., La Gatta, A., Paino, F., d'Aquino, R., (...), Papaccio, G.
Human Ng2+ adipose stem cells loaded in vivo on a new crosslinked hyaluronic acid-lys scaffold fabricate a skeletal muscle tissue
(2013) Journal of Cellular Physiology

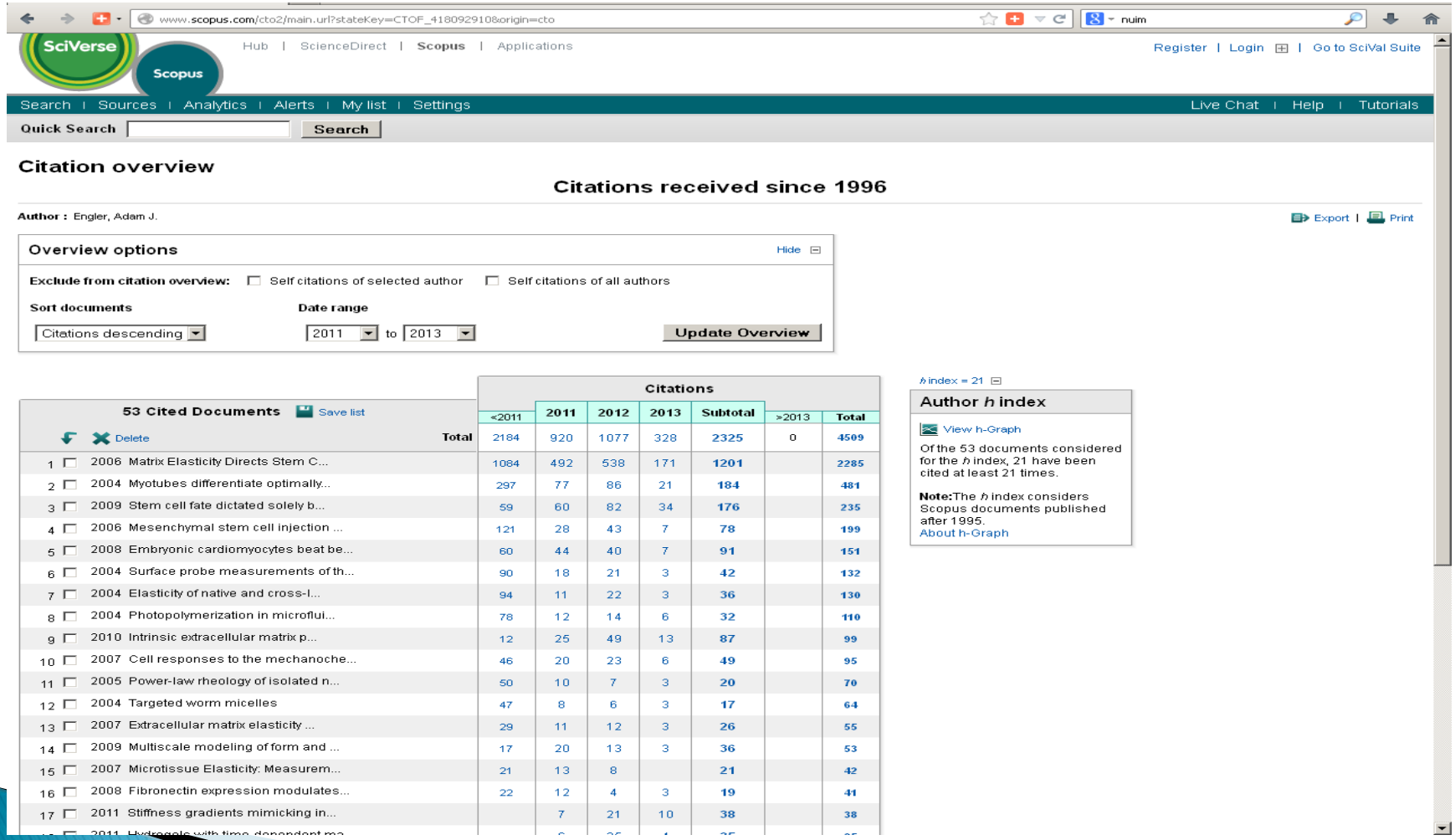
Abdeen, S.K., Salah, Z., Khawaled, S., Aqeilan, R.I.
Characterization of WWOX inactivation in murine mammary gland development

Document Overview
(Scopus)



Citation Overview

Adam J Engler on Scopus



www.scopus.com/cto2/main.url?stateKey=CTOF_418092910&origin=cto

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Citation overview

Citations received since 1996

Author : Engler, Adam J.

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Exclude from citation overview: Self citations of selected author | Self citations of all authors

Sort documents: Citations descending

Date range: 2011 to 2013

Update Overview

53 Cited Documents Save list

Delete

		Total	Citations <2011	2011	2012	2013	Subtotal	>2013	Total
			2184	920	1077	328	2325	0	4509
1	2006 Matrix Elasticity Directs Stem C...		1084	492	538	171	1201		2285
2	2004 Myotubes differentiate optimally...		297	77	86	21	184		481
3	2009 Stem cell fate dictated solely b...		59	60	82	34	176		235
4	2006 Mesenchymal stem cell injection ...		121	28	43	7	78		199
5	2008 Embryonic cardiomyocytes beat be...		60	44	40	7	91		151
6	2004 Surface probe measurements of th...		90	18	21	3	42		132
7	2004 Elasticity of native and cross-l...		94	11	22	3	36		130
8	2004 Photopolymerization in microflui...		78	12	14	6	32		110
9	2010 Intrinsic extracellular matrix p...		12	25	49	13	87		99
10	2007 Cell responses to the mechanoche...		46	20	23	6	49		95
11	2005 Power-law rheology of isolated n...		50	10	7	3	20		70
12	2004 Targeted worm micelles		47	8	6	3	17		64
13	2007 Extracellular matrix elasticity ...		29	11	12	3	26		55
14	2009 Multiscale modeling of form and ...		17	20	13	3	36		53
15	2007 Microtissue Elasticity: Measurem...		21	13	8		21		42
16	2008 Fibronectin expression modulates...		22	12	4	3	19		41
17	2011 Stiffness gradients mimicking in...			7	21	10	38		38

h index = 21

Author *h* index

View h-Graph

Of the 53 documents considered for the *h* index, 21 have been cited at least 21 times.

Note: The *h* index considers Scopus documents published after 1995.

About h-Graph

Author H Index
via Author Evaluator (Scopus)

Author Evaluator - Engler, Adam J.

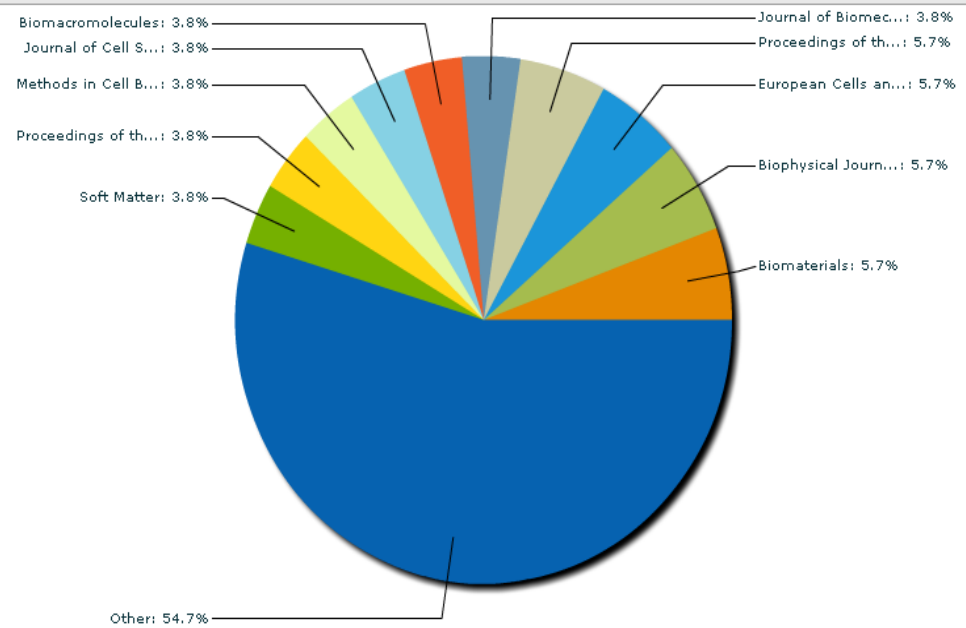
E-mail Print

Engler, Adam J.

Documents (53) | h Index (21) | Citations (4509)

Sources | Document Types | Years | Subject Areas | Co-Authors (110)

Sources This chart shows a breakdown of the author's documents by Source.



Source	Documents
Biomaterials	3
Biophysical Journal	3
European Cells and Materials	3
Proceedings of the 2005 Summer Bioengineering Conference	3
Journal of Biomechanics	2
Biomacromolecules	2
Journal of Cell Science	2
Methods in Cell Biology	2
Proceedings of the National Academy of Sciences of the United States of America	2
Soft Matter	2
Archives of Physiology and Biochemistry	1
Bioengineering Proceedings of the Northeast Conference	1
Biotechnology Journal	1
Cancer Research	1
Cell	1
Cellular and Molecular Bioengineering	1

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  - Highest Impact in a field
  - Largest Journal in a field
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  - average citation rate, h index and Journal Impact Factor
- Incites
  - InCites is a customized, citation-based research evaluation tool on the Web that enables you to analyze institutional productivity and benchmark your output against peers worldwide. Contact Subject Librarian to arrange access
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InCites is a customized, citation-based research evaluation tool on the Web that enables you to analyze institutional productivity and benchmark your output against peers worldwide.

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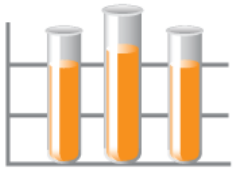

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Dataset: Irish Universities Association: NUI Maynooth: Address Search Dataset

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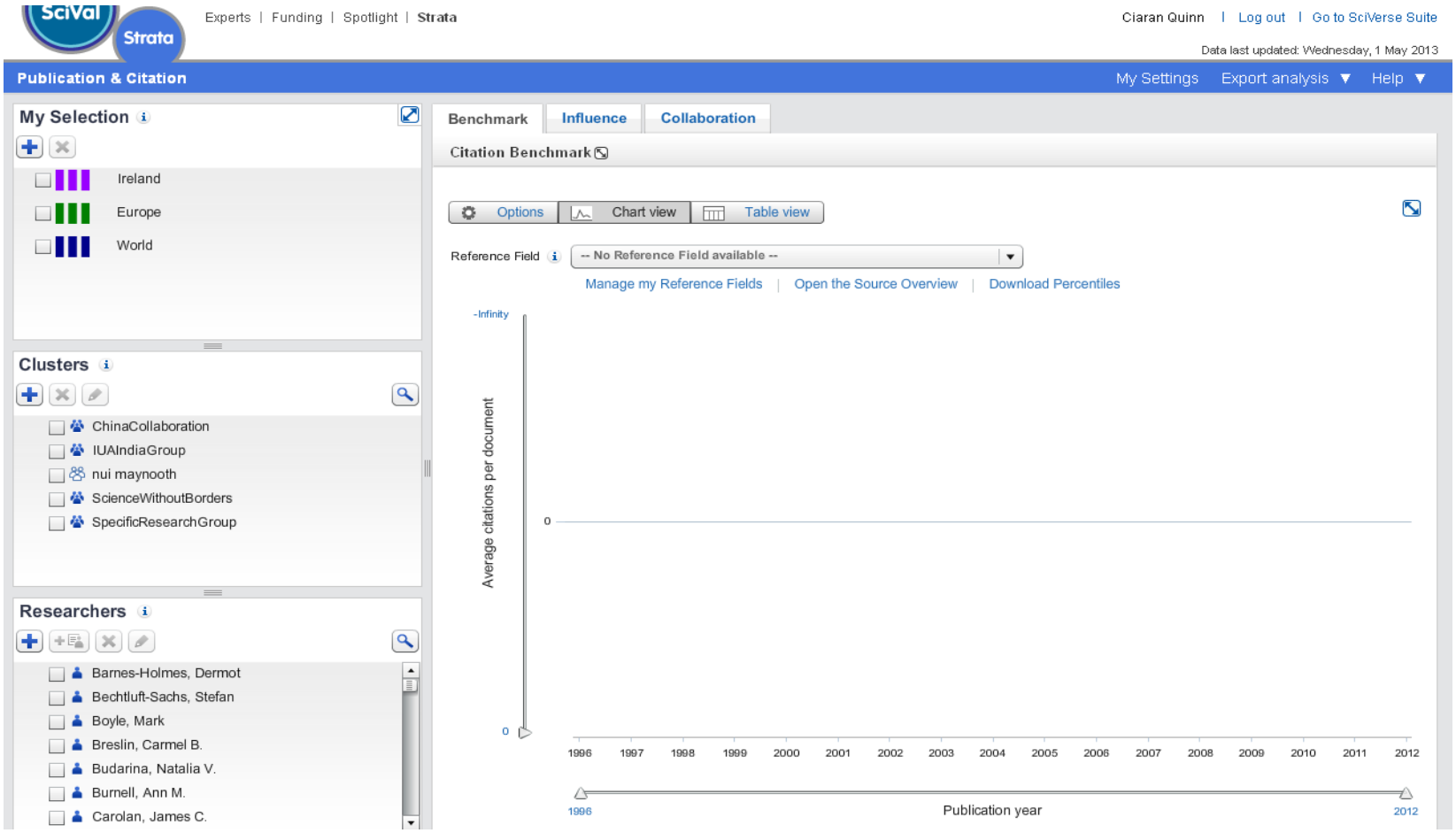


Altmetrics are?
Non Traditional Filters !

- Google Scholar Citations
- Google Scholar Metrics (includes Books)
- SciMago Journal & Country Rank (Elsevier data from 1996-2011)
- Altmetric & Impact Story
- PLoS (Public Library of Science)Open Access
- PMC Citation Search: (uses PubMed ID's)
- Reader Meter: Researcher-level metrics based on readership. Currently from Mendeley

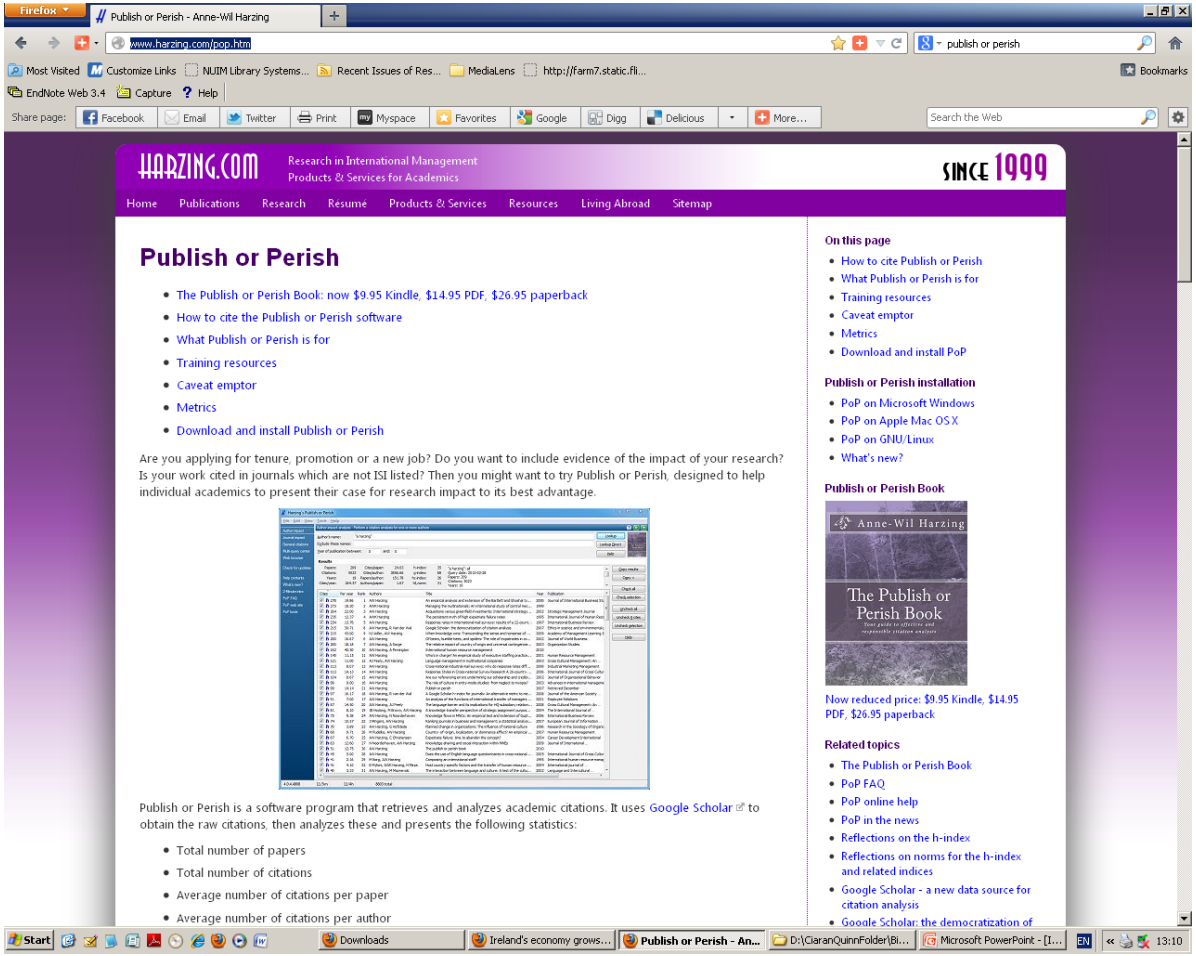
Specialist databases

- There may be specialist databases for your field that offer citation tools and a good coverage of the literature, here are some examples:

- **Spires** - free resource covering physics literature. Includes bibliometric data. http://www.slac.stanford.edu/spires/
- **Medline** - free resource indexing life science and biomedical publications. Includes citation data. http://medline.cos.com/
- **CiteSeer** - free resource for computer and information science publications.Includes citation data . http://citeseer.ist.psu.edu/citeseer.html
- **ArXiv** - Open access. Covers physics, mathematics, computer science, quantitative biology, quantitative finance and statistics . http://arxiv.org/

Google Scholar Metrics with Publish or Perish

http://www.harzing.com/pop.htm



Scholarly peer networks

- Academia.edu
- Mendeley
- Social Science Research Network (SSRN)
- VIVO : International Researcher Network
- Microsoft Academic Search

Does where I publish matter?

- Citation databases such as Web of Science and Scopus *index International, high Impact, Peer Reviewed Journal Titles*
  - *Exclude many books/conference proceedings/non English language*
- Are you publishing in those Journals?
- Do you publish mainly in Books?
- Are there opportunities to publish in Journals?
- Is your research in a field not prioritised by the bibliographic data providers?
  - If not notify us and we'll supply details to the database provider if the journal has a international audience

Improve your citations:make yourself visible!

- Use Researcher Profile Directory: expert database of all researchers at NUI Maynooth.
- Use NUI Maynooths Institutional Repository ‘Eprints’
  - Open Access policy
  - Deposit publications to RIS & automatically sent to eprints
- Avoid using different versions of your name and Institutional name variants (National University of Ireland Maynooth,)
  - Beware collaborative articles as it can affect the name variants !
- Use Research ID (Web of Knowledge)
  - Check your name variants & align with your publications
- Use Author Identifier (Scopus)
  - Merge your Author identities (disambiguation)and align with your articles

Encourage the Citation of your Work

- Help the Literature Reviewer !
  - Don’t be obscure use commonly used descriptors
  - Use informative titles
  - Be clear and informative in writing abstracts and book descriptions. Include the key points of the research.
  - Collaborative works attract more citations due to networking across researchers
  - Self cite but keep it in line with other academics
- Use social media and traditional media to get your work noticed

Finding Potential Research Collaborators

- **Increase your profile**
- **Promote your research**
- **SciVal ® Strata** (Elsevier): is a visualization tool that helps users track team and individual research performance across a flexible spectrum of benchmarks and measures.
- **Incites** (Thomson Reuters):is a customized, citation-based research evaluation tool on the Web that enables you to analyze institutional productivity and benchmark your output against peers worldwide.

Putting bibliometrics in context

- Bibliometrics & citation analysis is only one quantitative indicator of research. There are other quantitative indicators and qualitative approaches of which peer-review a key indicator.
- Bibliometric Measures:
  - Patterns of authorship, publication & the use of literature
- Benefits
  - Quantitative approaches could be argued to easier **be fairer?** than qualitative methods e.g. peer-review
  - Cost effective
  - Efficiency advantage & consitency
- Application & importance varies from field to field
  - tremendous controversy surrounds any assessment of the intellectual output of academics & researchers
- Examples Times Higher & QS Ranking to assess University Performance. Whole range in indices.
  - Measuring impact of literature
  - Just one of many measures

Research Skill Tutorials

http://library.nuim.ie/training/postgraduate

Research Skills Tutorials:

- Moodle Library Area (EBooks,Research Skills, Plagiarism, Referencing),
- Graduate School Generic Skills Training,
- VTS Tutorials
- Emerald Research Zone
- Net Skills
- Measuring your Research Impact (MyRI) online tutorial
- EndNote Web Help
- EndNote Web Training
- eTheses Information briefing sessions: PostGrad Forum

MyRI (Measuring your Research Impact)

- A collaborative project of four Irish academic libraries producing a set of materials to support bibliometrics training.
- http://www.ndlr.ie/myri/
- Contains:
  - **An online tutorial**
    This is in 3 modules: introductory overview; journal ranking; bibliometrics to support your career and research strategy. Includes videos and other interactive elements.
  - Product Profiles
  - Datasheets

Other Bibliometric Sources:

- Useful Links at:
  - Science & Engineering Subject Librarian Blog
  - http://ciarnthelibrarian.blogspot.ie/