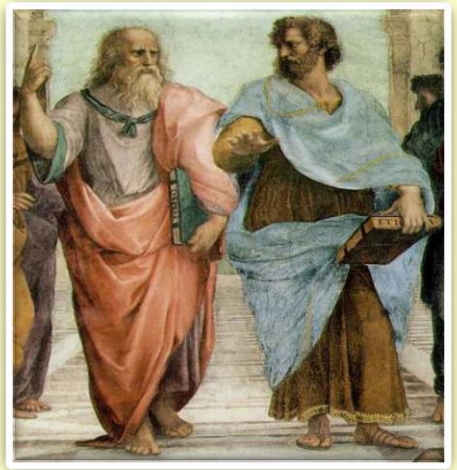


Popp, József

University of Debreceni

Ihrig Károly Doctoral School

How to measure scientific activity?



Debrecen

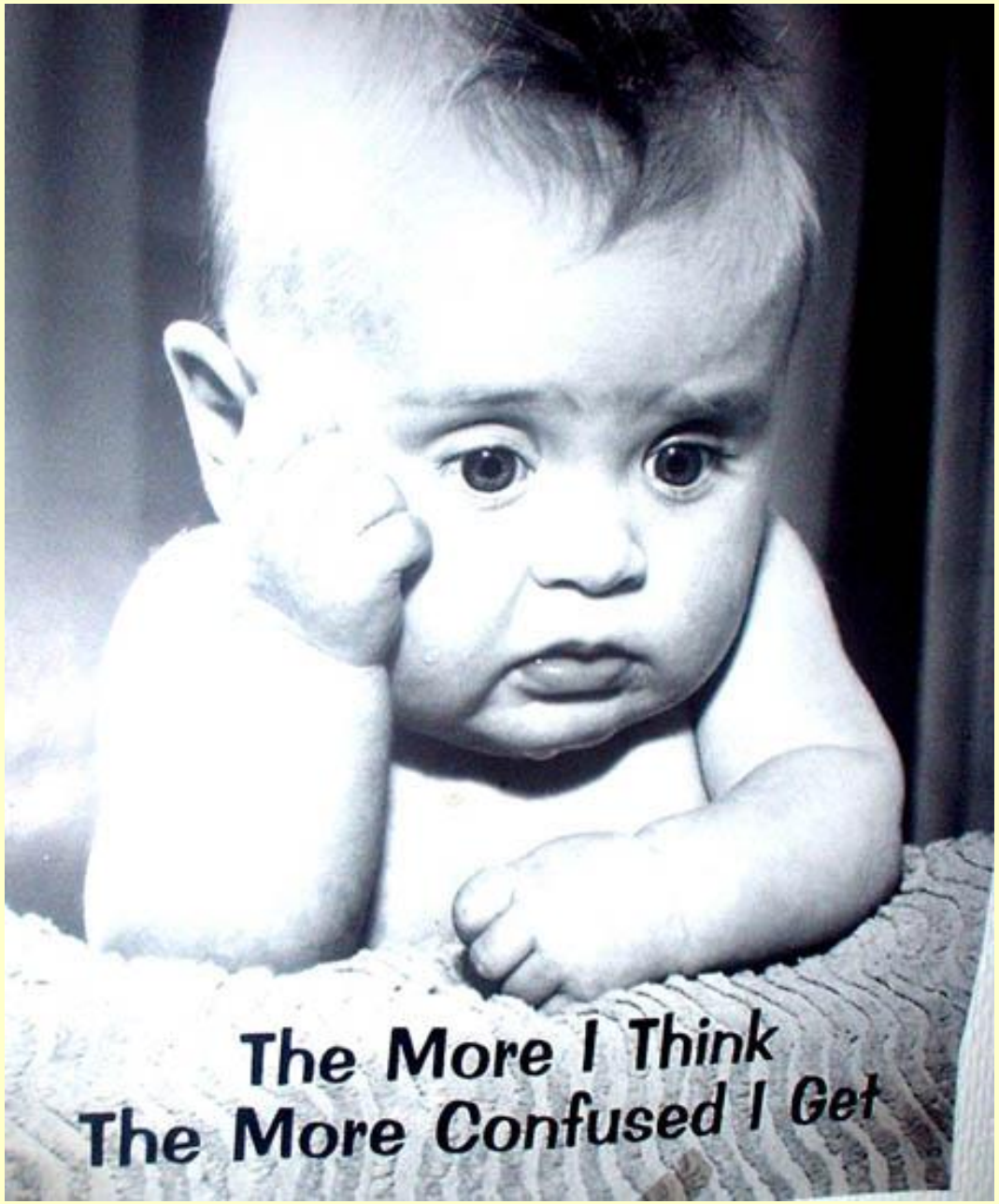
8 March 2019

Foreword

But in science the credit goes to the man who convinces the world, not to the man to whom the idea first occurs.

Sir Francis Darwin

Where do we begin?



The PhD factory

NATURE 21 APRIL 2011

Why publish and what is publishable….

Why publish?

- A paper is an organized description of hypotheses, data and conclusions to instruct the reader.

- **If it wasn't published, it wasn't done…**

Journals like to publish papers that are going to be widely read and useful to the readers.

- Papers that report **"original and significant" findings** that are likely to be of interest to a broad spectrum of its readers.

- Papers that are **well organized and well written**.

- Papers that are **concise and yet complete** in their presentation of the findings.

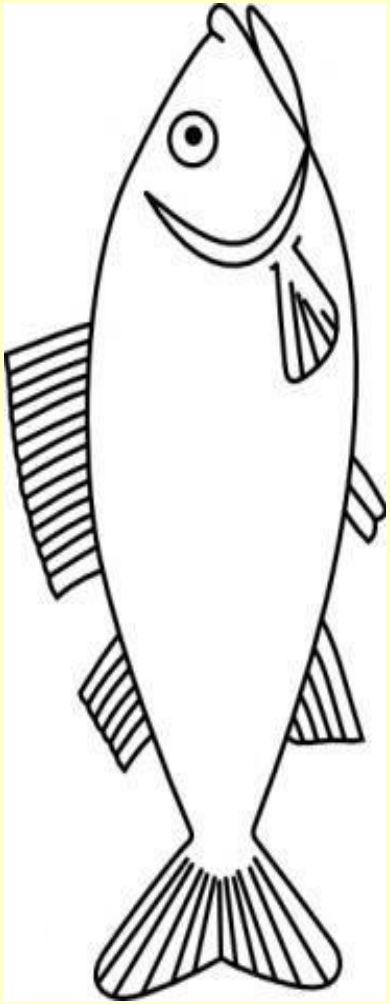
Useful tips to succeed in research

- **BE SELFISH. You are working for your degree program.**
- **It is your PhD. If you do not put hard work into it, nobody else will!**
- **Plan on publishing 3-4 papers in impact journals.**

Note: Each paper can serve as the basis for writing a chapter in your thesis.

- **Discuss the plan for writing your thesis with your advisor/supervisor.**
- **The role of your advisor/supervisor is to guide you through your project and help you succeed in your thesis.**

General structure of a research article



- **Title**
- **Abstract**
- **Keywords**

Make them easy for indexing and searching!
(informative, attractive, effective)

- **Main text (IMRAD)**
  - Introduction
  - Methods
  - Results
  - And
  - Discussions

Journal space is not unlimited.

Your reader's time is scarce.

Make your article as concise as possible - more difficult than you imagine!

- **Conclusion**
- **Acknowledgement**
- **References**
- **Supplementary Data**

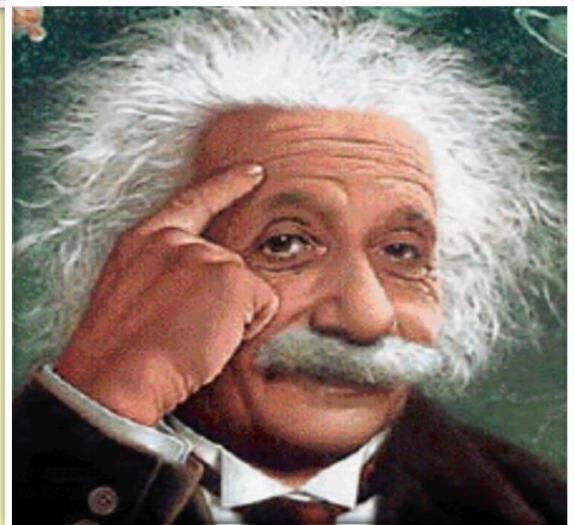
What is a good scientific article?

Novelty

Communication

CLEAR

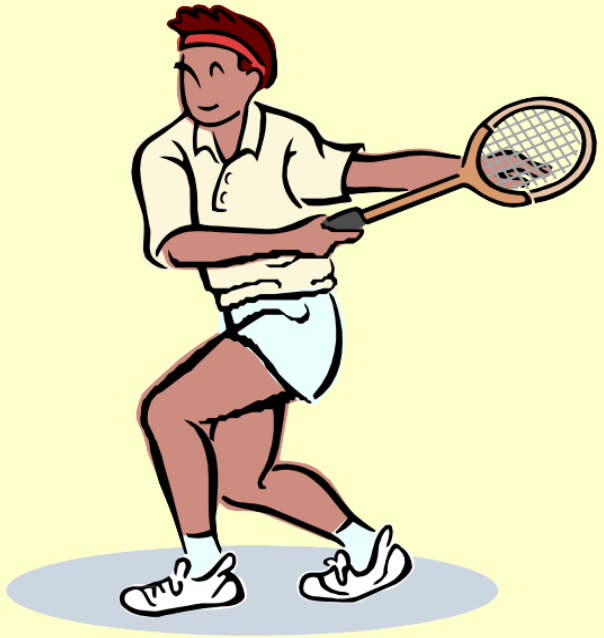
„If you can't explain something simply, you do not understand it well."
(Albert Einstein)



Rejected?

If your article is rejected, improve and resubmit!

For 90% submissions the problem is NOT ***novelty****, it is the* ***explanation of novelty!***



Publish and perish – if you break ethical rules

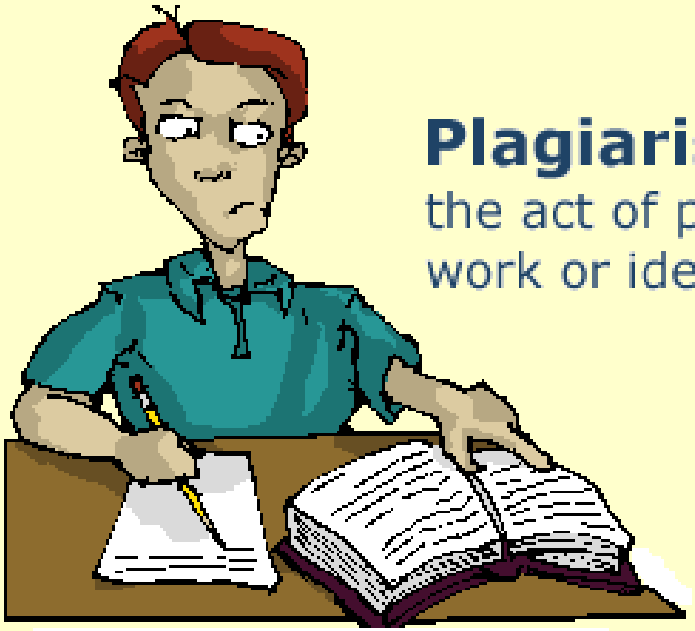
- Scientific ethics are not considered to have national variants or characteristics – there is a single ethical standard for science.
- Ethics problems with scientific articles are on the rise globally.
- **Unethical behavior:**

  - Multiple submissions,
  - Redundant publications,
  - Plagiarism: using the words of another person without giving appropriate attribution,
  - Data fabrication (altering data or results) and falsification (creating data),
  - Improper use of human subjects and animals in research,
  - Improper author contribution,

- **Main research misconduct**: honorary, quest or gift (phantom) authors

  - Listing undeserving authors on publications,
  - English publications of authors who don't have the resources to publish in English.

What are the reasons for plagiarism?



Plagiarism:
the act of presenting another's work or ideas as your own.

Paraphrase!!!

Source: http://www.indiana.edu/~wts/pamphlets/plagiarism.shtml

Publishing advice

- Submit to the right journal (scope and prestige)
- Submit to one journal only
- Do not submit “salami” article (slice an article)
- Pay attention to journal requirements
- Pay attention to structure
- Check the English
- Pay attention to ethical standards

Common problems with submissions

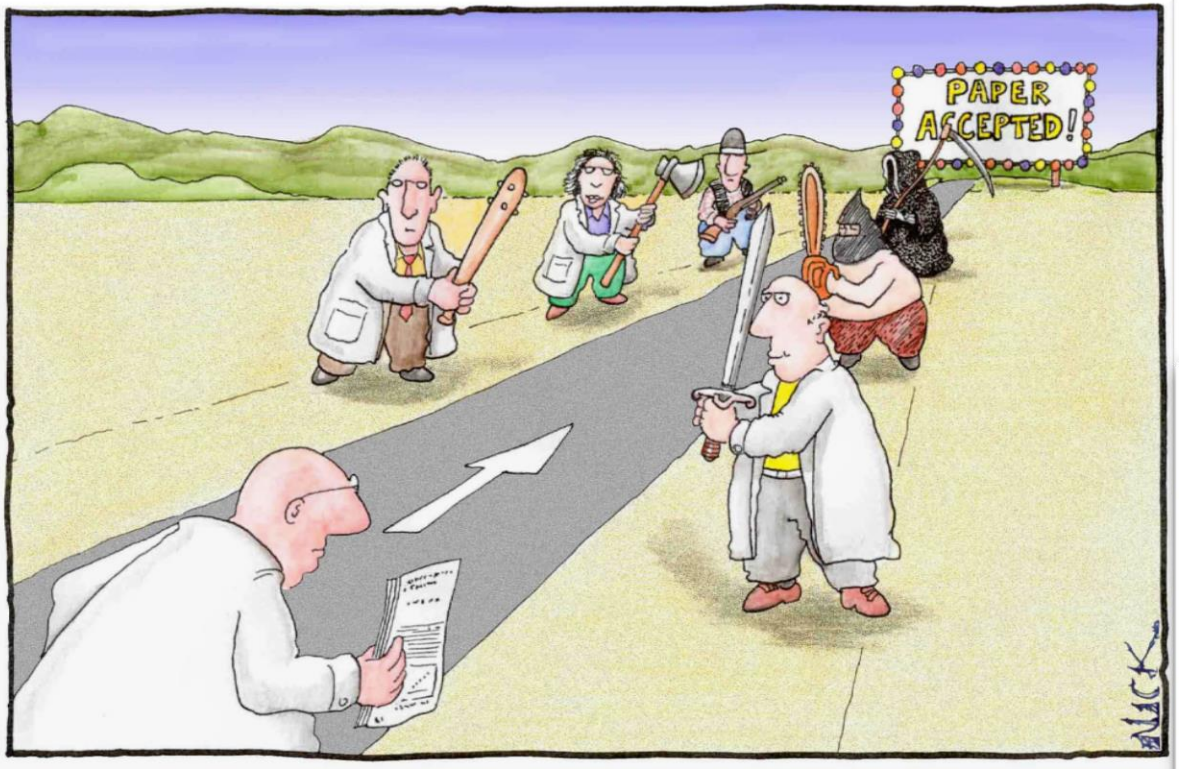
An international editor says…

"*The following problems appear much too frequently*"

- *Submission of papers which are clearly out of scope*
- *Failure to format the paper according to the Guide for Authors*
- *Inappropriate (or no) suggested reviewers*
- *Inadequate response to reviewers*
- *Inadequate standard of English*
- *Resubmission of rejected manuscripts without revision*

– Paul Haddad, Editor, *Journal of Chromatography A*

„Gatekeeper”



Most scientists regarded the new streamlined peer-review process as ‘quite an improvement.’

When u try to convince the reviewer

The Metric Tide:

Report of the Independent Review of the Role of Metrics in Research Assessment & Management

Underpinning infrastructure

- If metrics are to be used, it is critical that they are as accurate & reliable as possible, otherwise they will be mistrusted

- **How** underlying data is collected/processed is very important

- We therefore need:
  - Unique, disambiguated, persistent, verified **identifiers**
  - Agreed standard **data formats**
  - Agreed standard **data semantics**

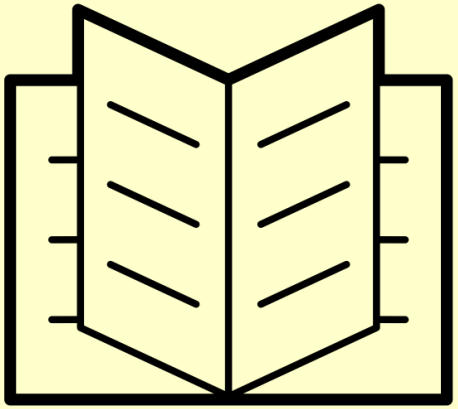
- If we are to end up with:
  - Agreed **standard metrics**

Role of metrics in research

In bibliometrics, what should we count/calculate?

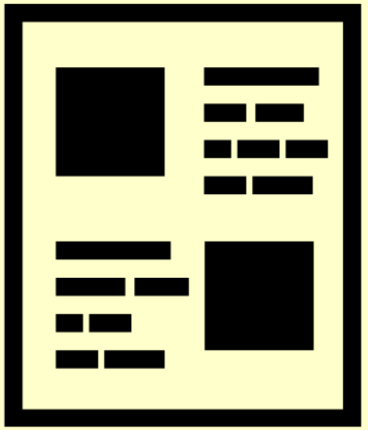
- **Total number of papers**
  - Measures quantity, but does not take quality into account; does not give due weight to influence.
- **Number of 'quality papers' e.g. defined as papers in WoS/Scopus**.
  - Relies on the inclusion in a particular journal as a measure of quality instead of trying to assess the actual quality of the paper.
- **Total number of citations**
  - Measures influence, but may be inflated by a small number of unrepresentative big hits.
- **Number of citations per paper**
  - Punishes productivity.
- **Number of papers with >x citations**
  - Rewards quality as well as quantity if a fair value of x is chosen
  - But different values of x need to be decided upon for different fields of research.

Levels of metrics



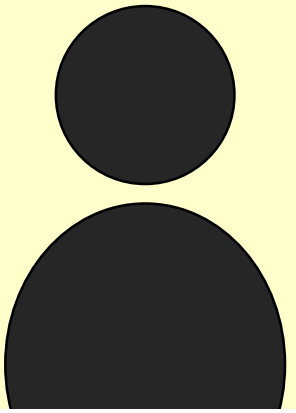
Journal/Venue Level Metrics

- Journal Impact Factor (JIF)
- 5-year JIF
- Eigenfactor



Output/Article Level Metrics

- Citation counts
- Field Weighted Citation Impact (Scopus)
- Eigenfactor Article Influence Score



Author Level Metrics

- h-index
- i-10 index
- Google Scholar

Journal-level metrics

- **Most journal-level metrics are calculated from the pool of journals indexed in two citation indexing databases:**

  – ***Web of Science(WOS) (Clarivate Analytics)***

    Over 11,549 journals from the Science Citation Index Expanded (SCIE) and Social Science Citation Index (SSCI).

  – ***SCOPUS (Elsevier)***

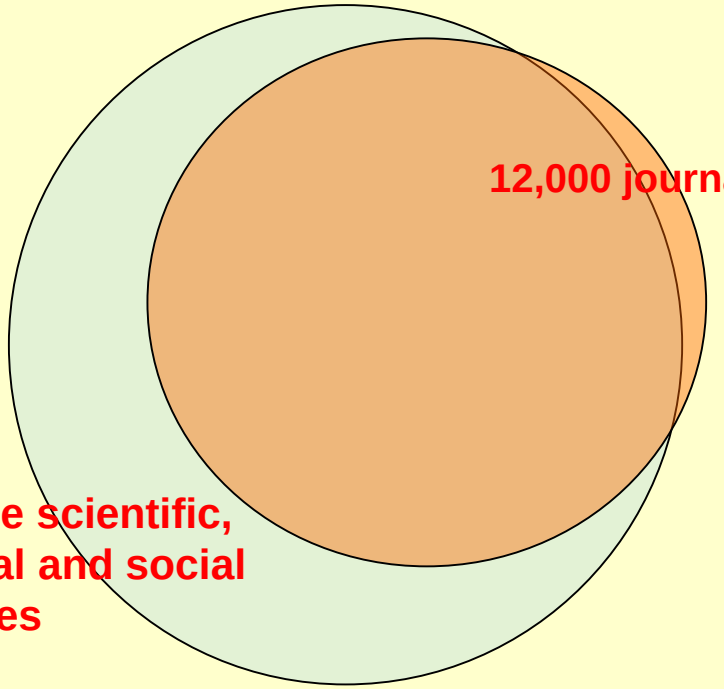
    Covers nearly 22,000 titles in the scientific, technical, medical and social sciences (including arts and humanities. Journal Metrics are freely available.

Journal-level metrics: research database

160 million documents

Google Scholar

H-index



12,000 journals

22,000 titles in the scientific, technical, medical and social sciences

Web of Science (Clarivate):

- Journal Impact Factor (JIF)
- EigenFactor (EF)
- Article Influence Score (AIF)

Scopus (Elsevier):

- Scimago Journal Rank (SJR)
- Source Normalized Impact per Paper (SNIP)
- Impact per Paper (IPP)

MTMT -
Journal Impact Factor >>
„Prestige factor” (SJR)

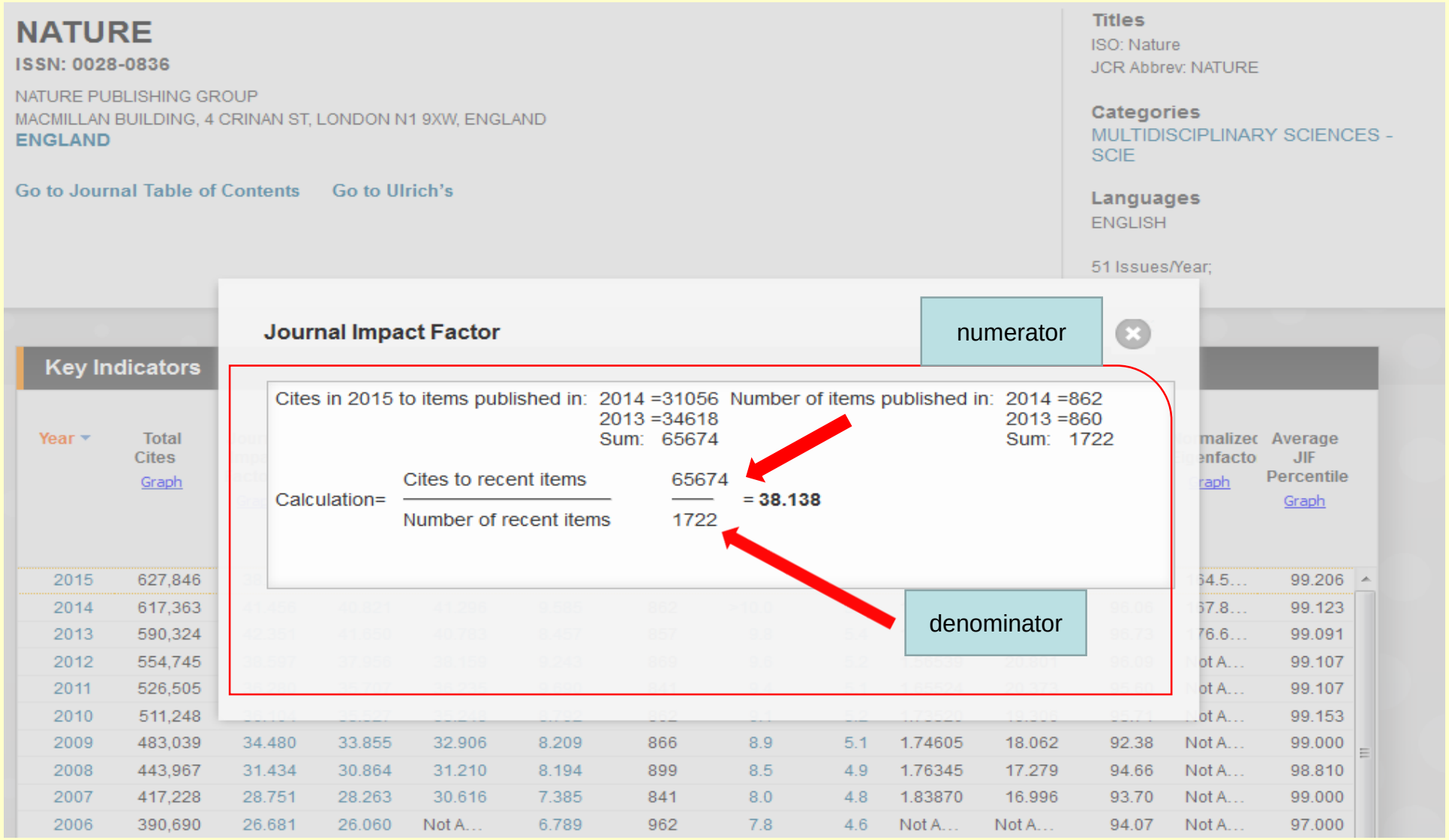
Clarivate Analytics: Journal Citation Reports (JCR)

- **Journal Impact Factor (JIF)**
  - The average annual number of citations per article published.
  - JIF is not normalized for discipline.
  - Can use Quartile position of title in category: Q1, Q2, Q3, Q4.

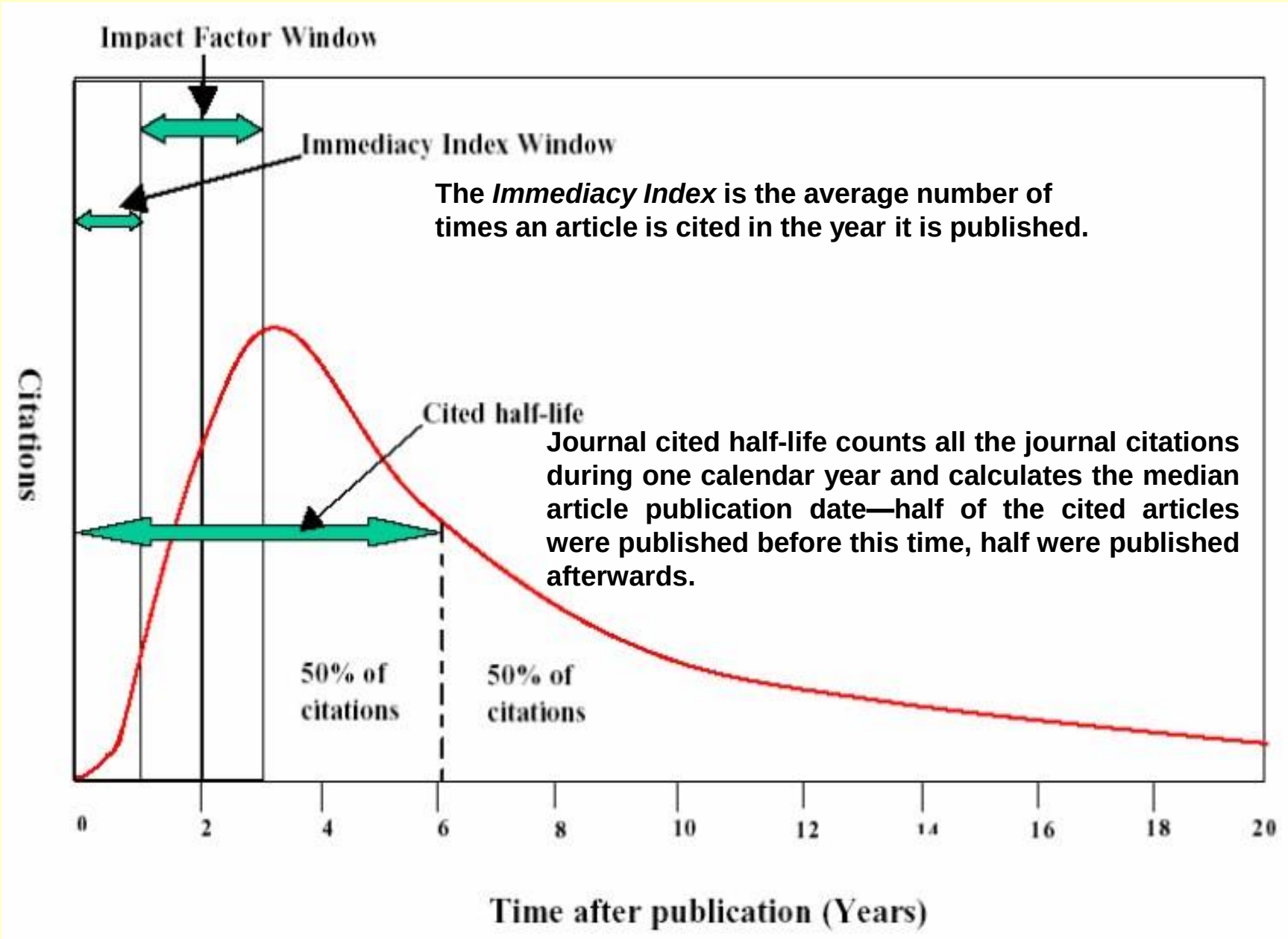
- **Same journals in WOS (Web of Science)**
  - Rigorous process to determine included journals.

- **Impact factor of a journal is the average number of citations to those papers published during the two preceding years**
  - Calculation of 2017 IF of a journal:
    - *A* = the number of times articles published in 2015 and 2016 were cited by indexed journals during 2017
    - *B* = the total number of "citable items" published in 2015 and 2016.
    - 2017 impact factor = *A*/*B* → **600 citations / 150 + 150 articles = 2.000**

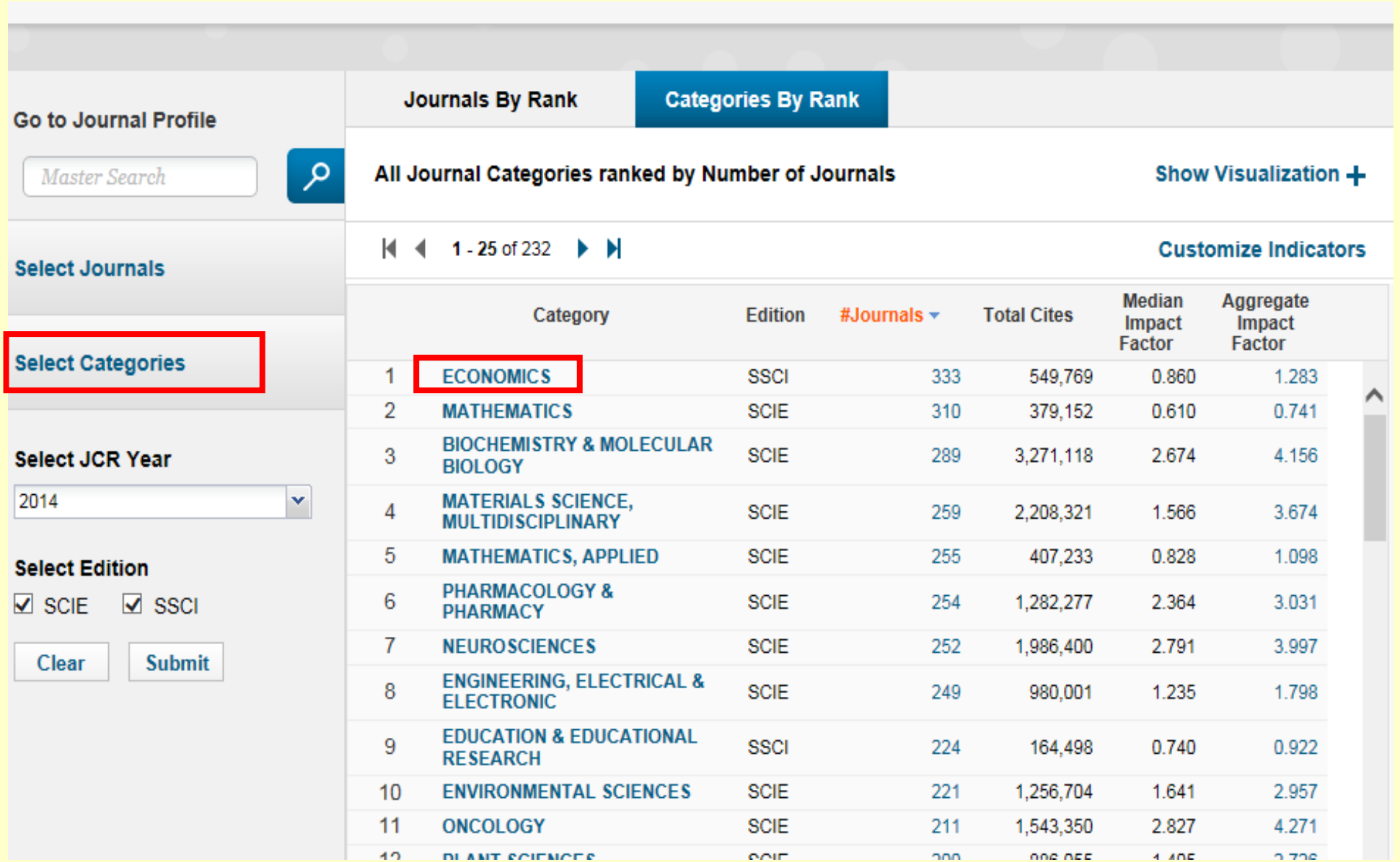
IF value – calculation



Impact Factor and other bibliometric parameters



Categories



Go to Journal Profile

Master Search

Select Journals

Select Categories

Select JCR Year

2014

Select Edition

SCIE SSCI

Clear Submit

Journals By Rank | Categories By Rank

All Journal Categories ranked by Number of Journals

Show Visualization +

1 - 25 of 232

Customize Indicators

	Category	Edition	#Journals	Total Cites	Median Impact Factor	Aggregate Impact Factor
1	ECONOMICS	SSCI	333	549,769	0.860	1.283
2	MATHEMATICS	SCIE	310	379,152	0.610	0.741
3	BIOCHEMISTRY & MOLECULAR BIOLOGY	SCIE	289	3,271,118	2.674	4.156
4	MATERIALS SCIENCE, MULTIDISCIPLINARY	SCIE	259	2,208,321	1.566	3.674
5	MATHEMATICS, APPLIED	SCIE	255	407,233	0.828	1.098
6	PHARMACOLOGY & PHARMACY	SCIE	254	1,282,277	2.364	3.031
7	NEUROSCIENCES	SCIE	252	1,986,400	2.791	3.997
8	ENGINEERING, ELECTRICAL & ELECTRONIC	SCIE	249	980,001	1.235	1.798
9	EDUCATION & EDUCATIONAL RESEARCH	SSCI	224	164,498	0.740	0.922
10	ENVIRONMENTAL SCIENCES	SCIE	221	1,256,704	1.641	2.957
11	ONCOLOGY	SCIE	211	1,543,350	2.827	4.271
12	PLANT SCIENCES	SCIE	200	996,055	1.405	2.726

Quartile of the journal (WoS)

- **Quartile position of title in category:**

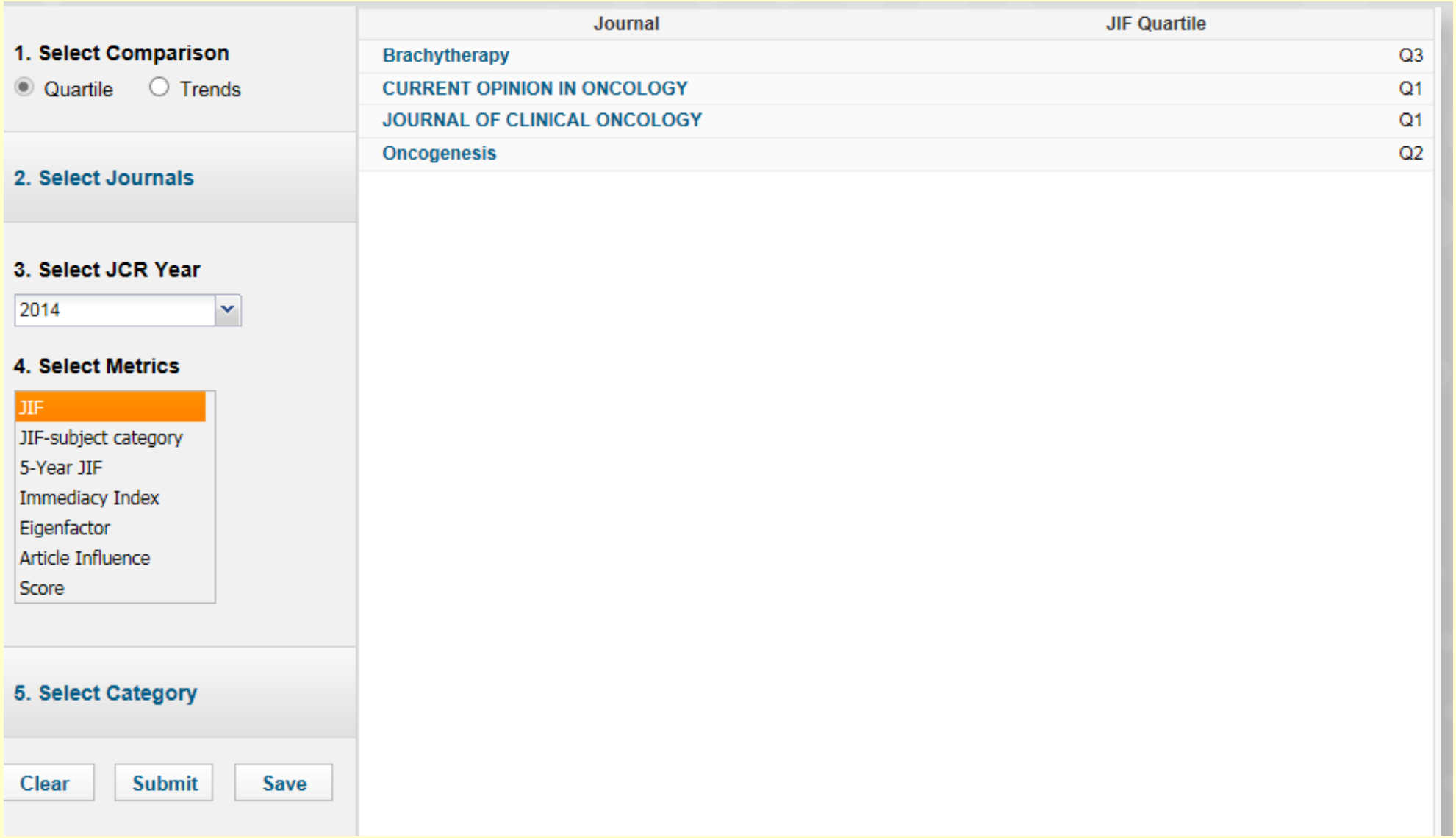
  - Q1 denotes the top 25% of the IF distribution

  - Q2 for middle-high position (between top 25% and top 50%)

  - Q3 middle-low position (top 50% to top 75%)

  - Q4 the lowest position (bottom 25% of the IF distribution)

Quartile”of the selected journals only in their category

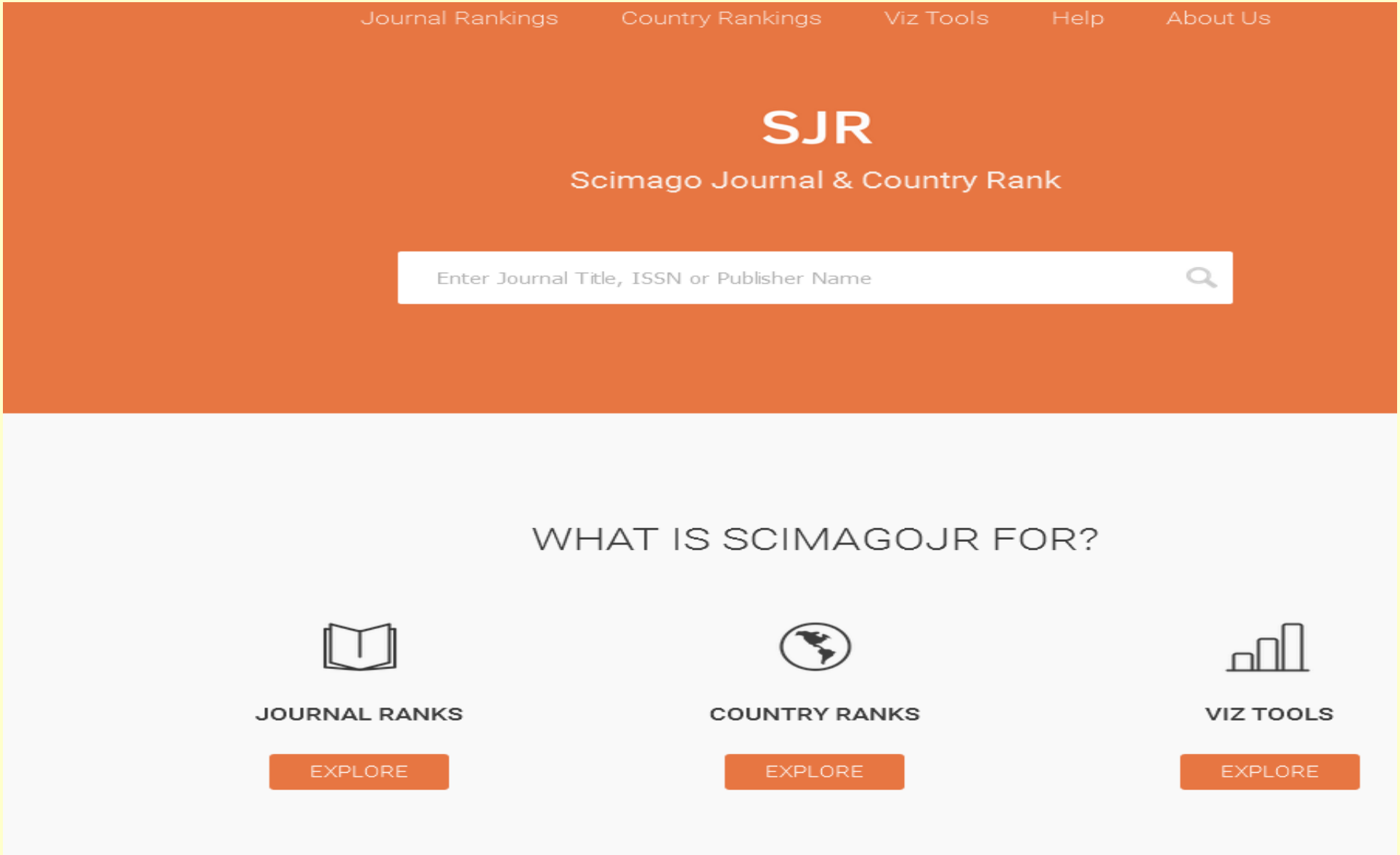


Scopus-based metrics

- **SCImago Journal Rank (SJR): comparable to IF as it is a measure of the scientific prestige of scholarly sources: value of weighted citations per document.**
  - Citations are weighted, depending on the rank of the citing journal.
  - A citation from an important journal will count as more than one citation; a citation coming from a less important journal will count as less than one citation.
- **SNIP (Source Normalized Impact per paper)**
  - Defined as the ratio of the raw Impact per Publication divided by the Relative Database Citation Potential.
  - Corrects for subject-specific characteristics of the field someone is publishing in so any two journal can be compared.
- **CiteScore (Elsevier)**
  - Calculates the average number of citations received in a calendar year by all items published in that journal in the preceding three years.
  - CiteScore counts all documents since they all have the potential to attract citations, and the Impact Factor counts the documents considered most likely to attract citations. CiteScore is independent of the document-type classification.

Scimago

http://scimagojr.com/



Quartiles of the journal (Scopus)

- **The set of journals have been ranked according to their SJR and divided in four equal groups for quartiles:**

  - Q1 (green) comprises the quarter of the journals with the highest values (top 25% of journals; top 10% D1 – decile1)

  - Q2 (yellow) the second highest values (top 25% to top 50%)

  - Q3 (orange) the third highest values (top 50% to top 75%)

  - Q4 (red) the lowest value (bottom 25%)

All subject areas | All subject categories | All regions / countries | All types | 2015

Display only Open Access Journals

Display journals with at least 0 | Citable Docs. (3years) | Apply

Download data

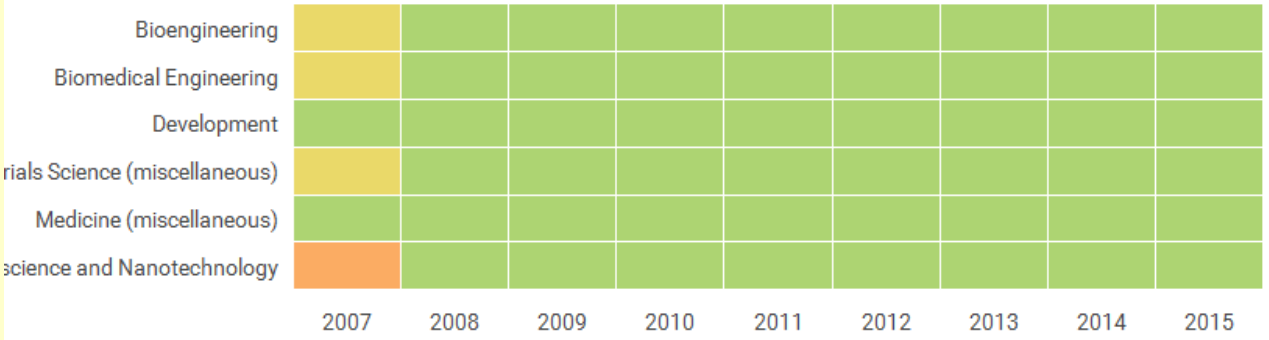
1 - 50 of 29713

	Title	Type	SJR	H index	Total Docs. (2015)	Total Docs. (3years)	Total Refs.	Total Cites (3years)	Citable Docs. (3years)	Cites / Doc. (2years)	Ref. / Doc.	
1	Nature Reviews Molecular Cell Biology	journal	32.928 Q1	324	170	539	8084	7978	202	37.10	47.55	
2	Annual Review of Immunology	journal	32.720 Q1	254	26	74	5684	2937	74	35.72	218.62	
3	Nature Reviews Genetics	journal	32.615 Q1	267	157	676	6584	8171	212	36.13	41.94	
4	CA - A Cancer Journal for Clinicians	journal	32.242 Q1	117	43	139	3741	8650	117	80.54	87.00	
5	Cell	journal	28.188 Q1	616	651	1794	25257	40673	1626	23.40	38.80	
6	Annual Review of Astronomy and Astrophysics	journal	27.065 Q1	138	16	41	3575	1373	40	35.04	223.44	

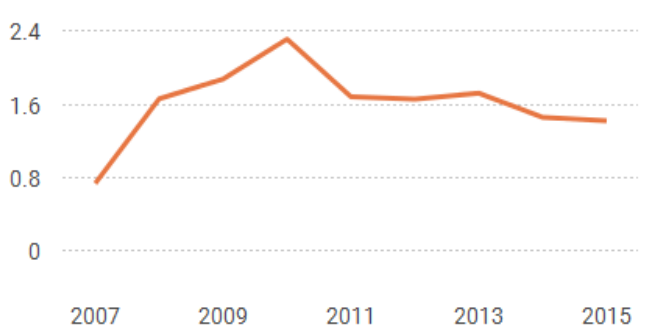
Nanomedicine

Country	United Kingdom
Subject Area	Chemical Engineering, Engineering, Materials Science, Medicine, Social Sciences
Subject Category	Bioengineering, Biomedical Engineering, Development, Materials Science (miscellaneous), Medicine (miscellaneous), Nanoscience and Nanotechnology
Publisher	Future Medicine Ltd.
Publication type	Journals
ISSN	17486963, 17435889
Coverage	2006-ongoing
Scope	Medicine has developed throughout time but has remained forever concerned with the maintenance of health and thus the sc and alleviation, and ultimately curing, of disease. To continue its development in new directions, medicine is now looking to n emerging scientific specialty born from nanotechnology, which has grown up in the fields of engineering, physics, chemistry a is now moving into medicine, with huge potential for expansion and development over the next decade and beyond. As our kn body continues to improve, nanotechnology will be developed to monitor, repair and control human biological systems at the (source)

tiles



SJR



otal Cites Self-Cites

External Cites per Doc Cites per Doc

% International Collaboration

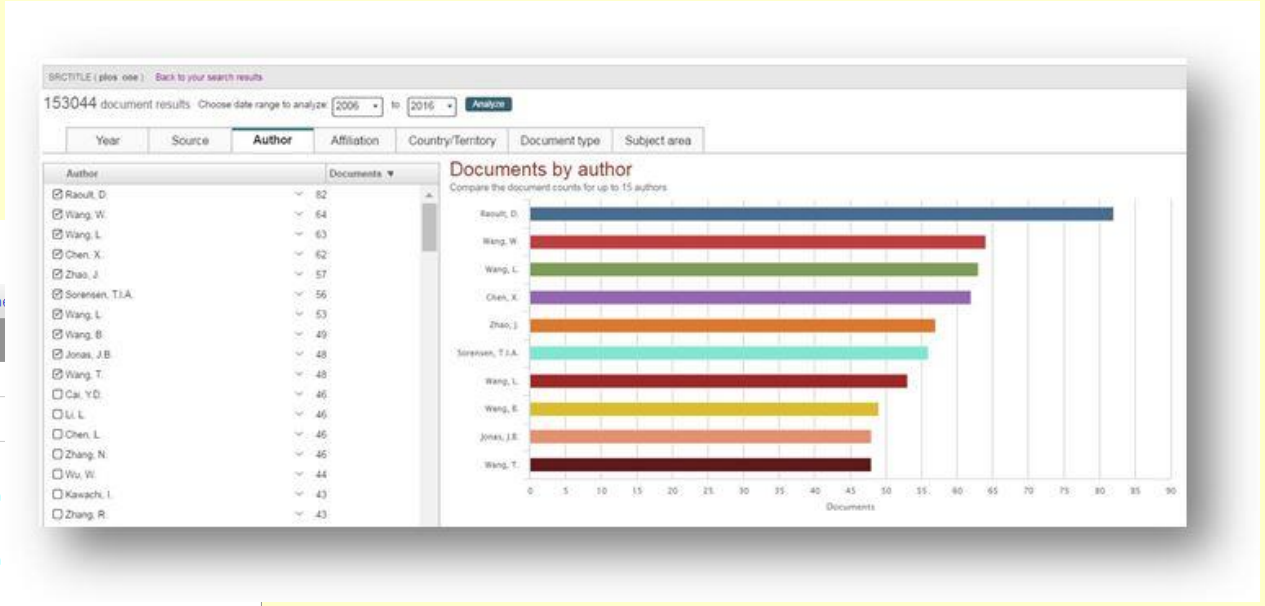
Article-level metrics

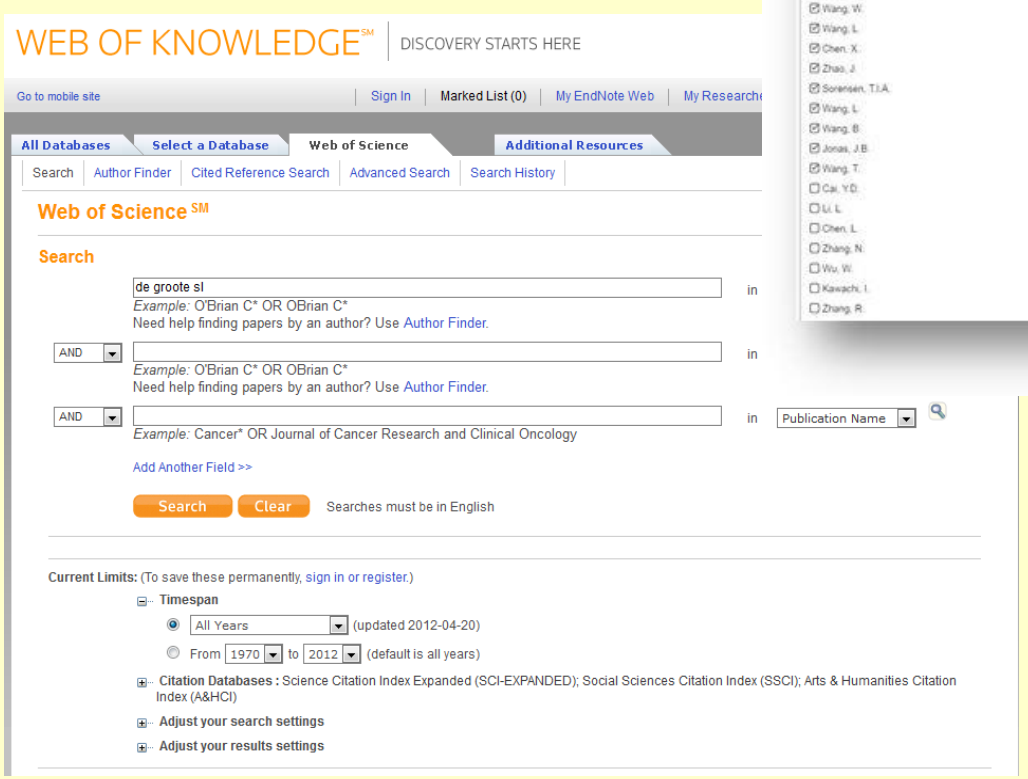
Citation-based and altmetric measures can show impact of individual research publication

- How many times was an article cited?
- How is it tracking in social media?
- What is the geographic distribution of citing papers?
- What is the disciplinary distribution of citing papers?
- What is the impact outside of the scholarly community?

Web of Science and Scopus

- **Limited to Journals indexed in Web of Science (JCR) and Scopus.**
- **Level of vetting for journal to be included in list.**





Google Scholar

- **No Journal Impact Tool.**
- **The Google Scholar index includes most peer-reviewed online (not paper-based) academic journals and books, conference papers, theses and dissertations, preprints, abstracts, technical reports, etc.**
- **Useful for authors and publications in disciplines less well covered by the commercial services.**
- **Author search in Google Scholar will produce a list of publications with citation and a link to Google Scholar Profile.**
- **Indexes varied content:**
  - Pro – Includes documents cited by literature such as policies
  - Con – Can inflate citation counts

Google Scholar Citations

Albert Einstein

Institute of Advanced Studies, Princeton
Physics
No verified email

Citation indices

	All	Since 2007
Citations	60244	20526
h-index	91	56
i10-index	328	186

Citations to my articles

Select: All, None Export Show: 20 **1-20** Next >

Title / Author	Cited by	Year
Can quantum-mechanical description of physical reality be considered complete? A Einstein, B Podolsky, N Rosen Physical review 47 (10), 777	9134	1935
On the movement of small particles suspended in stationary liquids required by the molecular-kinetic theory of heat A Einstein Annalen der Physik 17, 549-560	3539 *	1905
Zur Elektrodynamik der bewegter Kérper'Annalen der Physik, 17 A Einstein	2636 *	1955
Investigations on the Theory of the Brownian Movement A Einstein Dover Pubns	2166	1956
Eine neue bestimmung der moleküldimensionen A Einstein Annalen der Physik 324 (2), 289-306	1920	1906
The meaning of relativity A Einstein	1653	2003

József Popp

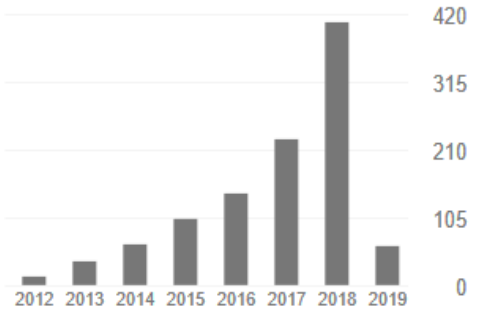
MÁR KÖVETEM

Professor of agricultural economics
E-mail megerősítve itt: econ.unideb.hu
agricultural economics

CÍM	IDÉZTE	ÉV
The effect of bioenergy expansion: food, energy, and environment J Popp, Z Lakner, M Harangi-Rakos, M Fari Renewable and Sustainable Energy Reviews 32, 559-578	284	2014
Pesticide productivity and food security. A review J Popp, K Pető, J Nagy Agronomy for sustainable development 33 (1), 243-255	244	2013
Consumer willingness to pay for traditional food products P Balogh, D Békési, M Gorton, J Popp, P Lengyel Food Policy 61, 176-184	61	2016
Biofuels and their co-products as livestock feed: global economic and environmental implications J Popp, M Harangi-Rákos, Z Gabnai, P Balogh, G Antal, A Bai Molecules 21 (3), 285	35	2016
The impact of crop protection on agricultural production J Popp, K Hantos Studies in Agricultural Economics 113 (1316-2016-102739), 47	29	2011
Technical and economic effects of cooling of monocrystalline photovoltaic modules under Hungarian conditions A Bai, J Popp, P Balogh, Z Gabnai, B Pályi, I Farkas, G Pintér, H Zsiborács Renewable and Sustainable Energy Reviews 60, 1086-1099	27	2016
Az EU Közös Agrárpolitikájának elmélete és nemzetközi mozgástere J Popp Európai Agrárpolitikai Kft.	25	2004
A főbb mezőgazdasági ágazatok fejlesztési lehetőségei, különös tekintettel az EU csatlakozásra J Popp Gazdálkodás 44 (4), 1-12	22	2000
Phytoaccumulation potentials of two biotechnologically propagated ecotypes of Arundo donax in copper-contaminated synthetic wastewater N Elhawat, T Alshaal, É Domokos-Szabolcsy, H El-Ramady, L Márton, ... Environmental Science and Pollution Research 21 (12), 7773-7780	19	2014

Idézte — ÖSSZES MEGTEKINTÉSE

	Összes	2014 óta
Idézetek	1254	1010
h-index	15	11
i10-index	26	14



Társszerzők — SZERKESZTÉS

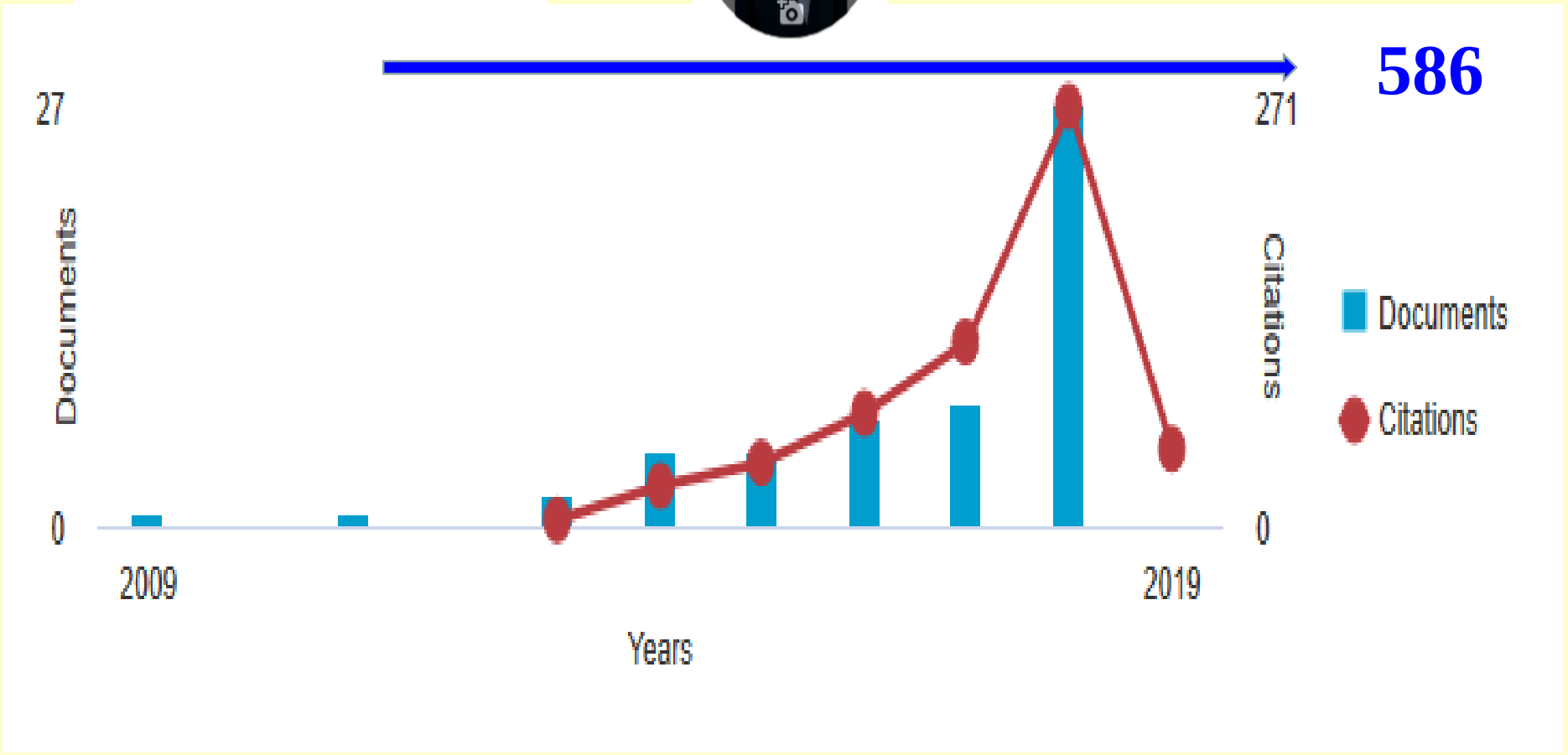
- Prof. Péter Balogh — Agrárökonómia, Debreceni Egye...
- Prof. Miklos G. Fari — Department of Agricultural Botan...
- Attila Bai — Professor, University of Debrecen
- Domician Máté — Debreceni Egyetem, Műszaki Kar
- Dr. Judit Oláh — associate professor. habil PhD
- Péter Lengyel — Debreceni Egyetem
- Karmazin György — főiskolai adjunktus, Szolnoki Főis...
- Dr. Attila Jambor — Corvinus University of Budapest
- Matthew Gorton — Newcastle University

Scopus citations (2009-2018)

50-100 Scopus/WoS citations needed fot the Title of Doctor of the Hungarian Academy of Sciences

Popp, József
Author ID:56031677900

Scopus



Forrás: https://www.scopus.com/hirsch/author.uri?stateKey=CTOF_1014075673&accessor=CTO&origin=cto&display=hIndex&documentCount=58&txGid=e76dba4ade81b99b89f4f2a84ce385bf

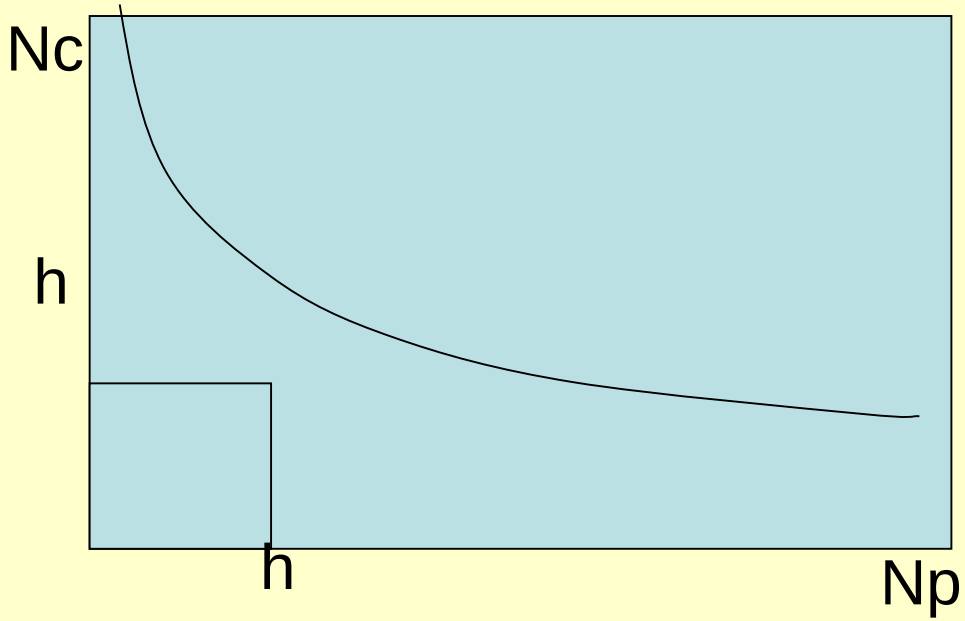
MTMT publication and citation summary table

Popp József 's data (2019.03.04)

Publication types	Count		Citations[1]	
Full scientific publications	All	Detailed	Independent	All
I. Scientific journal article	222	---	---	---
in international journal	---	79	833	913
in hungarian journal in foreign language	---	40	67	79
in hungarian journal in hungarian	---	103	137	183
II. Books	57	---	---	---
a) Book as author	38	---	---	---
in foreign language	---	5	0	1
in hungarian	---	33	133	161
b) Book as editor	19	---	---	---
in foreign language	---	4	[3]---	---
in hungarian	---	15	---	---
III. Book chapter	35	---	---	---
in foreign language	---	9	9	11
in hungarian	---	26	8	9
IV. Conference in journal or conference paper	51	---	---	---
in foreign language	---	26	20	22
in hungarian	---	25	28	31
Scientific publications (I.-IV.)	365	---	1235	1410
Other scientific works[4]	---	122	45	46
Number of citations	---	---	1283	1459
Hirsch index[5]	15	---	---	---
Educational works				
Higher educational books	7	---	---	---
in foreign language	---	2	0	0
in hungarian	---	4	1	4
Higher educational book chapter in foreign language	---	0	0	0
Higher educational book chapter in hungarian	---	1	0	0
Other educational works	1	---	0	0
Titles of protection	0	---	0	0
Achievement	0	---	0	0
Popular science works				
Books	0	---	0	0
Other popular science works	140	---	12	15
Of public interest and unclassified publications	5	---	0	0
Abstract	14	---	3	3
Other authorships	0	---	0	0
Citations of edited publications	---	---	38	42
Citations in dissertations and other types	---	---	189	200
All publications and citations	654	---	1523	1720

Author metrics: H-index

- **A scientist has the index h if h of his or her papers have at least h citations each - Hirsch JE (2005) PNAS 102(46): 16569-16572**
  - To have an h-index of 5, an author has to have 5 publications, each receiving at least 5 citations.
- **Variants include g-index and m-index**
  - Account for highly cited papers or author career span.



Where to find H-index

Value of the index may vary depending on the source of information (number of indexed publications, time span, etc.):

- **Web of Science**
  - To identify all publications by an author you can use Author Analyze search function or enter author's ORCID or ResearcherID identifier (if known).
- **Google Scholar**
  - Requires creation of Google Scholar profile before providing metrics.
  - H-index tends to be higher than what is calculated by Web of Science.
- **Publish or Perish** http://www.harzing.com/pop.htm
  - Freely accessible software program.
  - Uses Google Scholar data and includes h-index, g-index, m-index and other metrics.

What's next: The end of the Journal Impact Factor?

- May be… slowly: San Francisco Declaration on Research Assessment (2012).
- The Journal Impact Factor is frequently used as the primary parameter with which to compare the scientific output of individuals and institutions.
- The Journal Impact Factor has a number of well-documented deficiencies as a tool for research assessment:
  - citation distributions within journals are highly skewed
  - the properties of the Journal Impact Factor are field-specific: it is a composite of multiple, highly diverse article types, including primary research papers and reviews
  - Journal Impact Factors can be manipulated (or "gamed") by editorial policy
- Do not use journal-based metrics, such as Journal Impact Factors, as a surrogate measure of the quality of individual research articles, to assess an individual scientist's contributions, or in hiring, promotion, or funding decisions.
- For the purposes of research assessment, consider the value and impact of all research outputs (including datasets and software) in addition to research publications, and consider a broad range of impact measures including qualitative indicators of research impact, such as influence on policy and practice.

Forrás: San Francisco Declaration on Research Assessment, Annual Meeting of The American Society for Cell Biology (ASCB), San Francisco, CA, December 16, 2012).

Prestige, tenure, and impact factor

- Altmetrics = Alternative ways of measuring the use and impact of scholarship
- “Altmetrics are measures of scholarly impact mined from activity in online tools and environments” (Jason Priem)
- Altmetrics combines traditional impact measures (citation counts) with non-traditional measures
- **Altmetrics = ALL METRICS**

Altmetrics

“Altmetrics expand our view of what impact looks like, but also of what’s making the impact.

This matters because expressions of scholarship are becoming more diverse.”

From http://altmetrics.org/manifesto/

Simply, altmetrics are metrics beyond traditional citations.

What altmetrics address

- How many times something is downloaded?
- Who is reading the work?
- Has it been covered by news outlets?
- Who is commenting on the work?
- How is it being shared?
- Which countries are looking at my work?

http://pitt.libguides.com/altmetrics/introduction

Possible future: altmetrics?

- New metrics such as the Relative Citation Ratio
- Changing expectations of funding agencies
- Acceptance of altmetrics
- Social Impact

Special Olympics Seattle 1992

- For the hundred-yard dash, there were nine contestants, all of them so-called physically or mentally disabled.
- All nine of them assembled at the starting line and, at the sound of the gun, they took off.
- But one boy stumbled, fell and hurt his knee and began to cry.
- The other eight children slowed down, turned around, and ran back to him.
- The boy got up, and he and the rest of the runners linked their arms together and joyfully walked to the finish line.
- When they finished the race at the same time, everyone in the stadium stood up and clapped and whistled and cheered for a long, long time.

And you know why?

Because deep down we know that what matters in this life is more than winning for ourselves. What really matters is helping others win, too, even if it means slowing down and changing our course now and then.

Alfred Nobel

Alfred Nobel

1833-1896

My dynamite will sooner lead to peace than a thousand world conventions.

As soon as men will find that in one instant, whole armies can be utterly destroyed, they surely will bide by golden peace.

The history of the Nobel Prize

Alfred Bernhard Nobel (1833-1896) invented dynamite, endowed a $9 million fund in his will.

The interest on this endowment was to be used as awards for people whose work most benefited humanity.

He wanted the profit from his invention to be used to reward human ingenuity.

First awarded in 1901, the **Nobel Prize** is still the most honored in the world.

Provisions on the five Nobel Prices

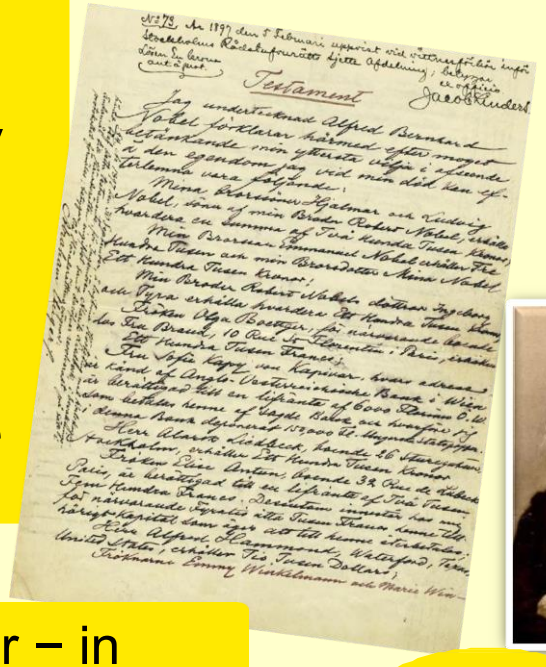
The whole of my remaining realizable estate shall be dealt with in the following way: the capital (...) shall constitute a fund, the interest on which shall be annually distributed used in the form of prizes to those who, during the preceding year, shall have conferred the greatest benefit on mankind. The said interest shall be divided into five equal parts, which shall be apportioned as follows: one part to the person who shall have made the most important discovery or invention within the field of physics, (...) one part to the most imortant chemical discovery or improvement, (...) one part to the domain of physiology or medecine, one part to the domain of literature (...); **and one part to the person who shall have done the best work for brotherhood between nations, for the abolition or reduction of the standing armies and for the holding and promotion of peace congresses**".

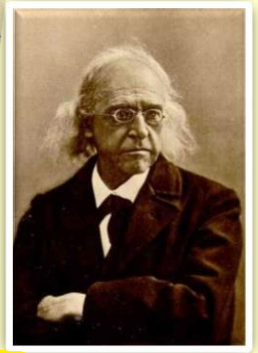
Alfred Nobel's will, signed in Paris on November 27, 1895

The will of Alfred Nobel

According to the will of Alfred Nobel, a yearly Prize should be awarded in five categories: physiology or medicine, physics, chemistry, literature and peace.

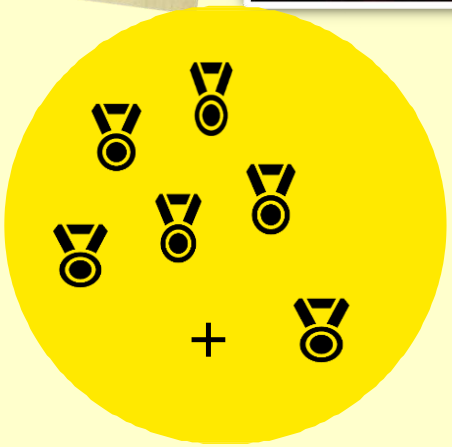
And it should reward those who “shall have conferred the greatest benefit to mankind.”

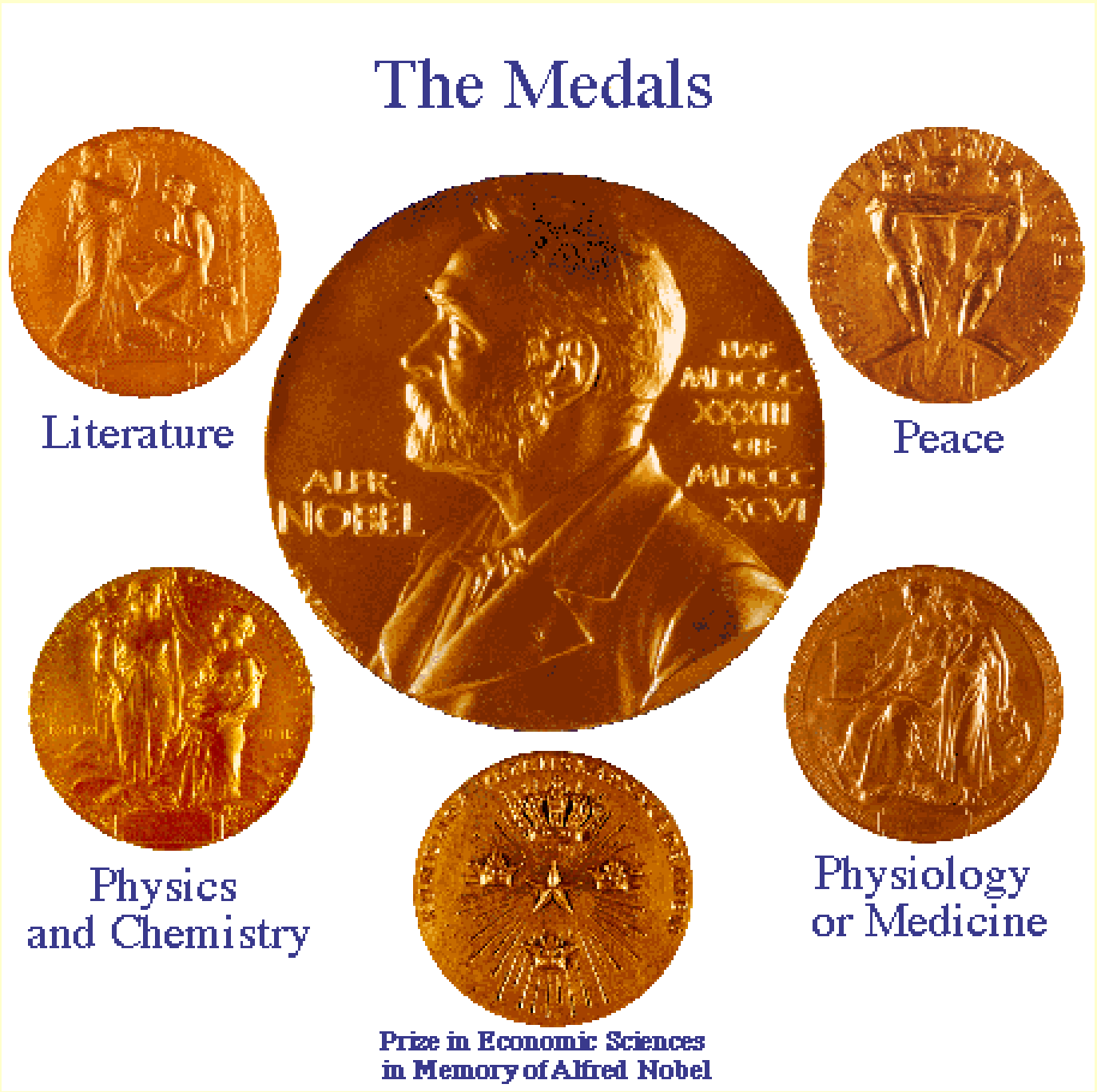

Testament



The Prize in Economic Sciences was created later − in memory of Alfred Nobel.

Sveriges Riksbank, Sweden’s central bank, established the prize in 1968 with the help of a donation





All medals made before 1980 were struck in 23 carat gold.

Today, they are made from 18 carat green gold plated with 24 carat gold.

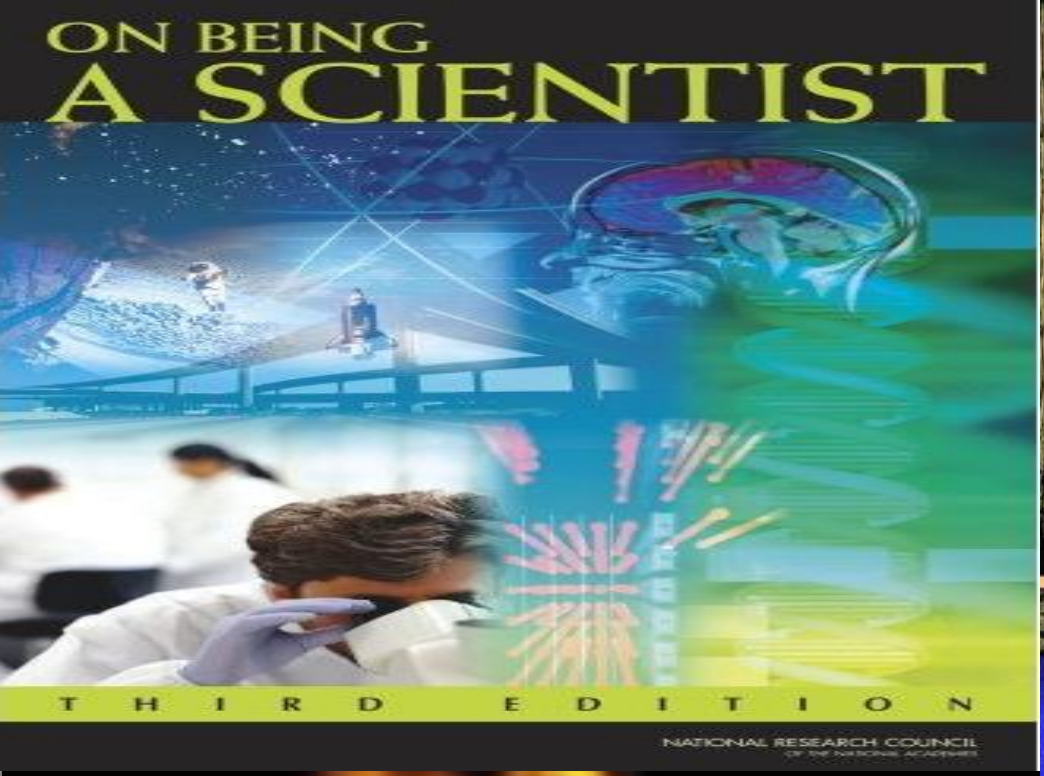
However….

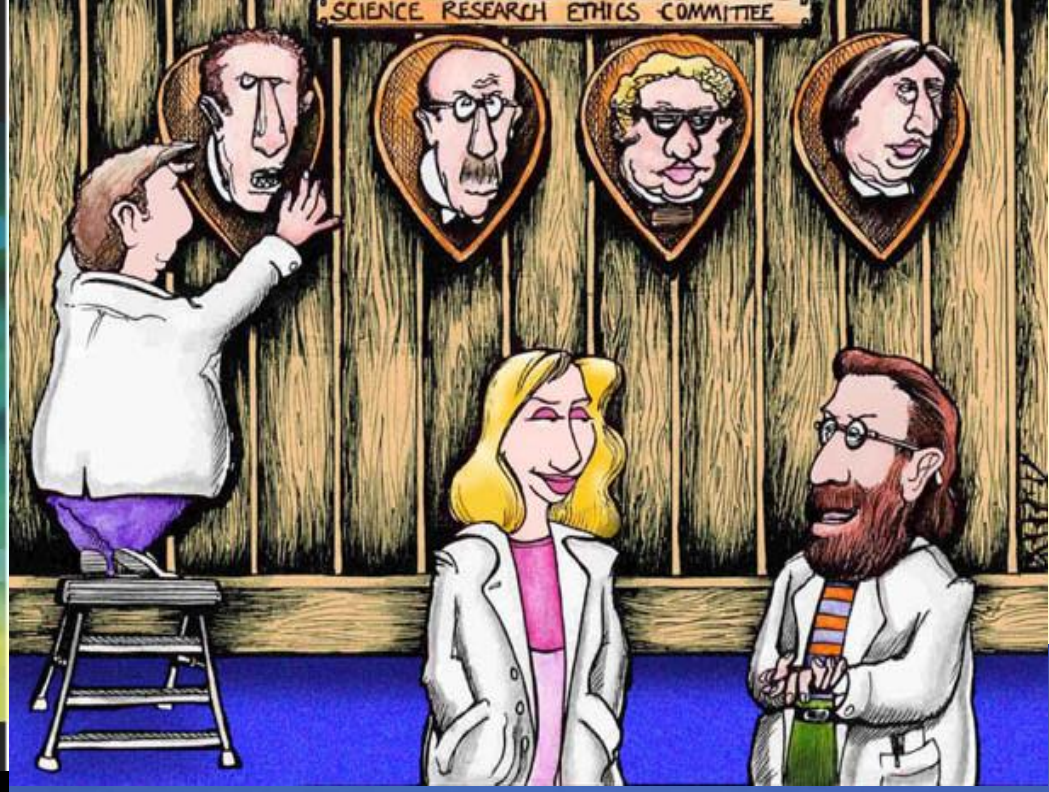
- Due to the fact that the Nobel Peace Prize is the world's most important price (therefore, very visible and prestigious)…

- The Norwegian Nobel Committee has come under increasing political, geopolitical and commercial pressures

  ➡ INAPPROPIATE AWARDS?…

- On many occasions, this brushes aside the visionary intent of Alfred Nobel's will (it is still a legal binding duty!)





QUESTIONS?

popp.jozsef@econ.unideb.hu

BE SPECIFIC
NOT GENERAL!