

Daniel Torres-Salinas

Bibliometrics in practice: how to generate reports for institutions.



JULY 23 – 28
2018
VIENNA

Introduction



Objectives and index

★ Learn **how to design bibliometric reports at the institutional level** (e.g., universities, hospitals, research centers). We are going to concentrate in a specific report: the **annual memory** (University of Granada - UGR).

★ Mission of the bibliometrics units

★ Talk Index

- What information sources can we use
- Content and selection of bibliometrics indicators
- Making data available online
- Examples of different reports



Type of bibliometric Reports

If you are working for a bibliometric unit or research evaluation unit
What kind of bibliometric reports can you offer to your institution?

**Annual
memory**

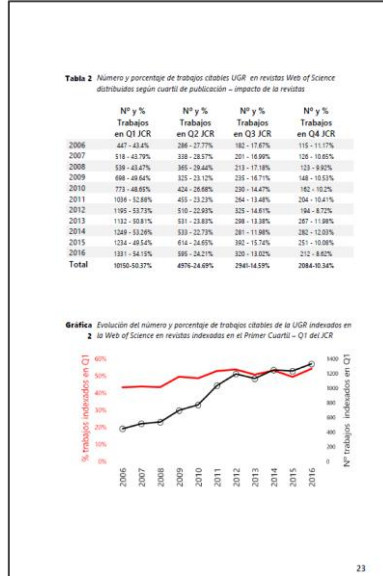
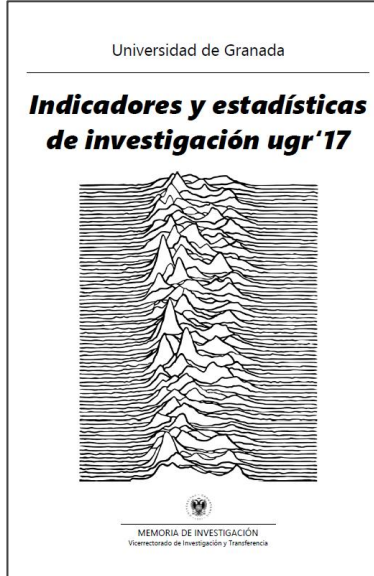
**Reports on a
specific
topics
relevant to
the institution**

**Reports on
demand by
policy
managers**

Type of bibliometric Reports

- Specific topics, for example gender, collaboration
- Specific areas, for example humanities
- Specific information sources, for example altmetrics
- Specific document type, for example books
- Reports on demand, examining a program
- Publication ... Open Access
- Reports on new social media

Case Study: University of Granada



For this course we are going to take as a case study the annual memory from the University of Granada

“Indicators and statistics at the University of Granada”

Download at:

<https://tinyurl.com/y8ywsdu3>

Structure of a bibliometric report

For an annual memory we have to consider at least the following sections:

Indicadores y estadísticas
de investigación ugr'17

Contenido

1. Highlights ugr'17
2. Fuentes e indicadores
3. Indicadores globales
4. Ranking de Shanghai
5. Comparativa de universidades
6. Disciplinas y especialidades
7. Áreas y universidades
8. Excelencia científica
9. Proyectos y contratos
10. Investigadores destacados

Main sections

- 1) Summary
- 2) Sources and indicators
- 3) General view
- 4) Fields and disciplines
- 5) Benchmarking and comparisons
- 6) Funding information

Information Sources



Types of sources



★ External database

- Bibliographic databases and Citation Indexes: Scopus or Web of Science Core Collection,
- Bibliometric suites: Incites or Scival

★ Internal databases

- Current Research Information Systems (CRIS)
- Institutional administrative databases (Projects, Staff, etc...)

★ Other complementary sources

- World University Rankings
- Online academic profiles
-

Types of sources



★ External database

- In-Cites for bibliometric indicators (Around 60% of the report)

★ Internal databases

- e-proyecta: internal management database for projects

★ Other complementary sources

- ARWU (Shanghai) - Benchmarking and verification of scientific policies
- Google Scholar Profiles to identify outstanding researchers and promote internet visibility

Incites for reports



- ★ At the University of Granada we use InCites from Clarivate Analytics. We recommend this bibliometric suite if:
 - you are working in large and multidisciplinary institutions
 - you don't have time for normalization and data cleaning
- ★ **Advantages:** indicators are already calculated, you can download raw data and use them for your report
- ★ **Disadvantages:** non-normalization for authors, inaccurate information for institutions due to errors in the organization enhanced field...

Bibliometric suites (Incites or Scival) are expensive (between 35.000-60.000 Euros) depending institution's size.

Incites for reports

The screenshot shows the InCites interface with a search bar at the top left containing the text "Search 76 results...". On the right side, there are "Benchmarks" and a download icon. Below the search bar, a table header is visible with columns for "Name", "Rank", and "Web of Science Documents". An "Export These Results" dialog box is open on the right, showing "File Name" as "InCites Organizations", "File Type" as "CSV", and "Records" as "76". There is an "Export" button at the bottom right of the dialog.

The screenshot shows a Microsoft Excel spreadsheet with the following data:

	A	B	C	D	E	F
1	Name	Rank	Web of Science Documents	Category Normalized Citation Impact	International Collaborations	H-Index
2	University of Barcelona	1	28165	1.57	54.64	156
3	Autonomous University of Barcelona	2	19764	1.38	53.07	114
4	Complutense University of Madrid	3	15443	1.09	44.93	86
5	University of Valencia	4	14121	1.46	51.2	107
6	University of Granada	5	12989	1.3	50.47	91
7	Autonomous University of Madrid	6	12338	1.45	55.76	106
8	University of Basque Country	7	11897	1.17	51.11	83
9	University of Sevilla	8	11099	1.1	42.13	76

The main advantage of InCites is provided useful datasets!!

Content and indicators



What indicators

- Which bibliometric indicators should you use?
 - **Easy interpretation.** Complex indicators are difficult to comprehend and should be avoided.
 - **Standard indicators** approved by the international community.
 - They have to reflect the **different dimensions** of research performance

What indicators

Useful indicators for reports. **Four types of dimensions seven indicators**

01 Production

- Number of documents
- Number of citable documents

02 Collaboration

- Number of documents with international collaboration

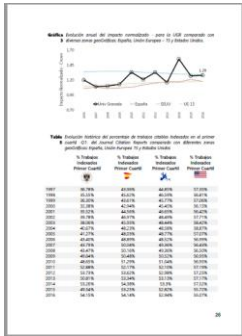
03 Impact

- % of papers in first quartile journals
- Category Normalized Citation Impact

04 Excellence

- % Highly Cited Papers
- Papers in top journals (Science & Nature)

Contextualization of performance



- ★ **Bibliometric indicators make sense when comparing with different aggregation levels**, i.e. compare university with the national average. How is our institution performing in comparison with the national average?
- ★ **Some indicators for benchmarking** are the Category Normalized Citation Impact (InCites), relative indicators like percentage of papers in first quartile journals or percentage of papers in international collaboration
- ★ In Granada, we compare different indicators with three geographical regions: Spain, European Union and USA
- ★ **Without contextualization there is no meaning!**

Contextualization of performance

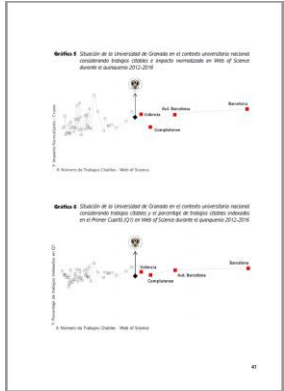
- ★ Example for the publication profile in high impact factor journals
- ★ Indicator > Percentage of papers in first quartile journals



2011	52.88%	52.17%	52.10%	57.19%
2012	53.73%	53.62%	52.98%	57.25%
2013	50.81%	53.34%	53.13%	57.17%
2014	53.26%	54.38%	53.3%	57.52%
2015	49.54%	53.25%	52.82%	55.72%
2016	54.15%	54.14%	52.94%	55.07%

- ★ The publication profile of the University of Granada is quite similar to the national and international standards

Benchmarking & Comparisons



- ★ It is important to compare also our institution with other similar institutions. We have to **select a coherent and homogeneous benchmarking group** taking into account at least this variables:
 - **Size of research output** How many papers?
 - **Size of staff** How many faculty?
 - **Same institutional objectives** Focus on teaching or research?
 - **Similar disciplinary profile** Humanities, Life Sciences...?
- ★ At the University of Granada we compare our results with Spanish historical universities with a multidisciplinary profile.
- ★ Data from other institutions is retrieved from the Shanghai Ranking

Benchmarking & Comparisons

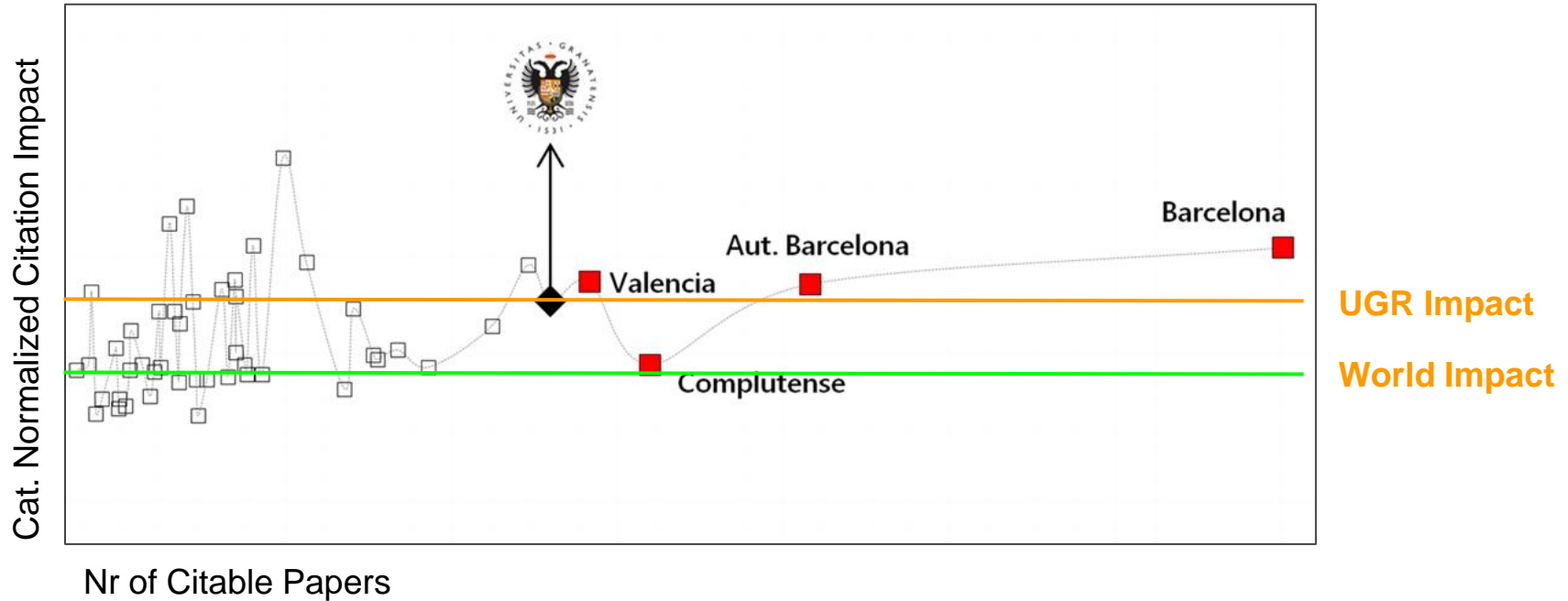
- ★ Example: benchmarking of the university of Granada with Spanish universities.

Nombre Universidad	Nr of Citable Papers	Category Normalized Citation Impact	% International Collaboration	% First Quartile
University of Barcelona	30047	1.54	52.40%	60.53%
Autonomous University of Barcelona	18647	1.39	50.98%	58.50%
Complutense University of Madrid	14802	1.06	43.58%	53.39%
University of Valencia	13332	1.40	50.88%	56.74%
University of Granada	12393	1.32	48.39%	52.28%
Autonomous University of Madrid	11860	1.47	54.33%	62.04%
University of Basque Country	10984	1.22	50.25%	57.63%
Universitat Politecnica de Valencia	8217	1.08	41.77%	55.26%
University of Santiago De Compostela	7642	1.29	50.88%	56.50%
Pompeu Fabra University	5942	1.91	59.95%	66.13%

All universities perform better than Granada according based on the percentage of papers in First Quartile Journals

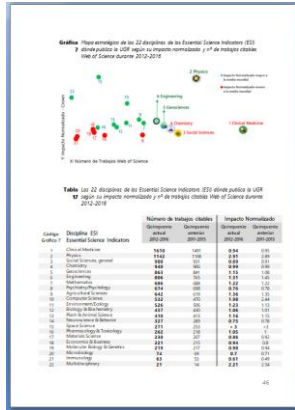
- ★ UGR performs well according to the number of citable papers, impact and collaboration, but has to improve the share of papers in first Quartile journals

Benchmarking & Comparisons



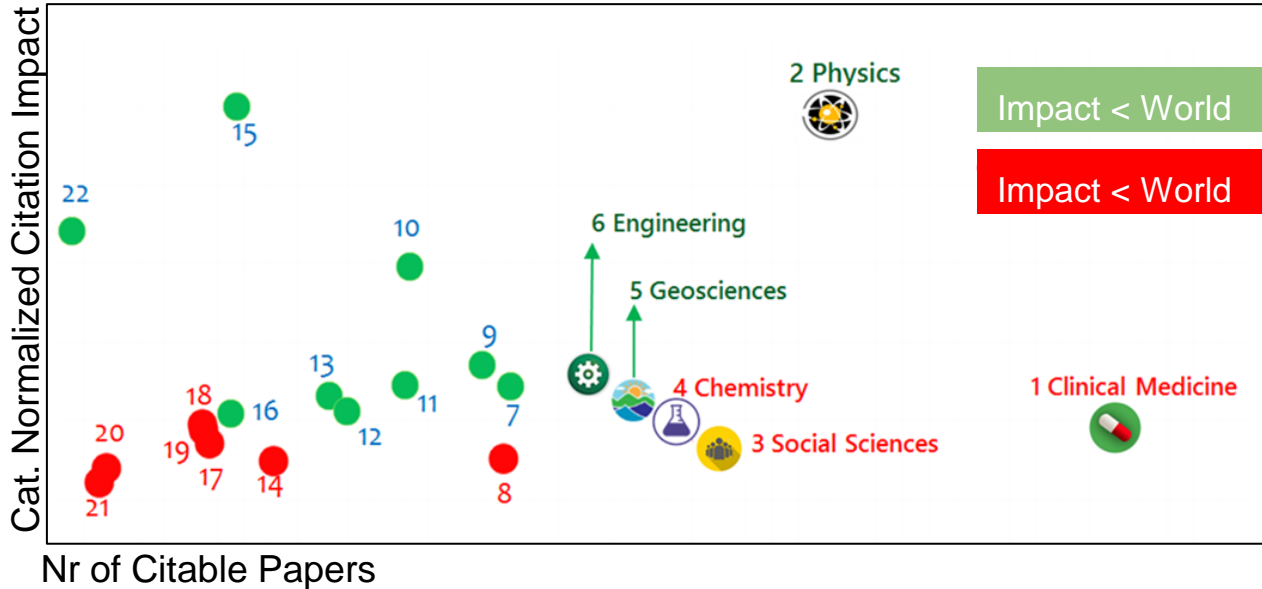
- ★ If we are working at universities it is important also to represent in a bivariate graph the position of our institution within our national university system

Fields and disciplines



- ★ Another question that we have to address in our report is the thematic profile of our institutions; **detecting best fields fields and disciplines**
- ★ For this we must consider the use of **different aggregation levels**. Select at least one general level for an overview of the fields (for example Essential Science Indicators, 22 fields) and a more specific discipline level (for example Web of Science Categories, more than 200 categories).
- ★ **Differentiate always between Science and Social Sciences / Humanities**

Fields and disciplines



1 Clinical Medicine, 2 Physics, 3 Social Sciences, 4 Chemistry, 5 Geosciences, 6 Engineering, 7 Mathematics, 8 Psychology, 9 Agricultural Science, 10 Computer Sciences, 11 Ecology, 12 Biology, 13 Plant & Animal Science, 14 Neuroscience, 15 Space Science, ...

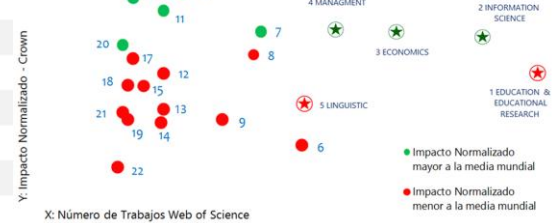
We can see the general scientific profile of the UGR according ESI classification.

In this case we can identify very productive but low impact areas (1, 3, 4); very productive and high impact areas (2); relatively productive but with high impact areas (15) and not productive and low impact areas (14, 17, ...)

Take care when choosing a classification, for example ESI does not have an specific field for the Humanities

Fields and disciplines

Web of Science Category	Nr Citable Papers	Category Normalized Citation Impact	% International Collaboration	% First Quartil Journals
Social Sciences and Humanities				
EDUCATION & EDUCATIONAL RESEARCH	193	0.82	26.94%	11.61%
INFORMATION SCIENCE & LIBRARY SCIENCE	172	1.07	25.58%	43.37%
ECONOMICS	138	1.10	52.90%	27.27%
MANAGEMENT	114	1.12	28.95%	23.91%
LANGUAGE & LINGUISTICS	102	0.62	22.55%	--
LINGUISTICS	101	0.34	28.71%	11.96%
BUSINESS	85	1.10	28.24%	18.18%
SOCIAL SCIENCES, INTERDISCIPLINARY	82	0.95	36.59%	51.25%
HISTORY	70	0.51	5.71%	5.00%

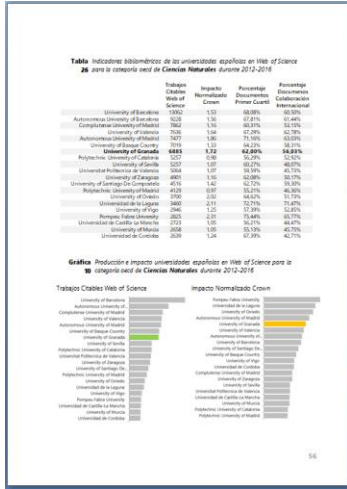


- ★ In this example we have the second level of presentation of the data at the disciplinary level, the WoS categories applied to the social sciences and the humanities.

Combining fields and institutions

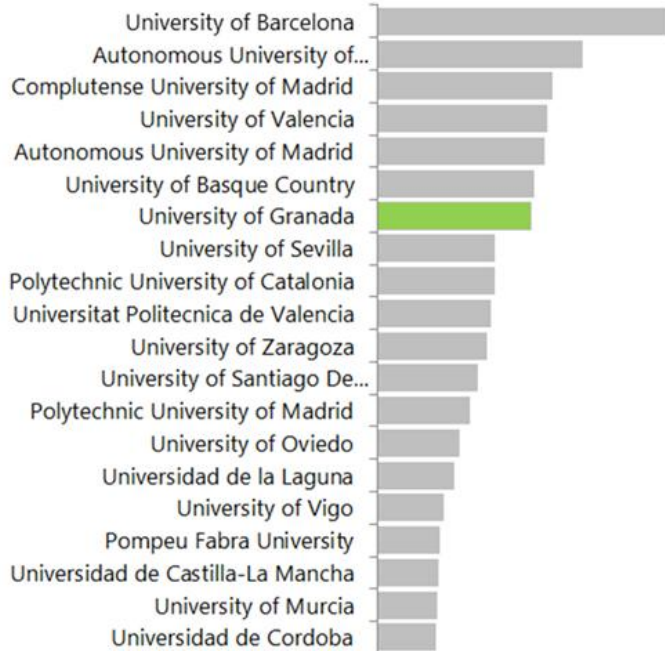
- ★ Another interesting option to complete the report is to compare the performance of our institution with other universities in different scientific fields.

- ★ At University of Granada we check its position in five different fields (Natural Science, Engineering, Health Sciences, Social Sciences and Humanities) and compare its results with the Spanish university system.

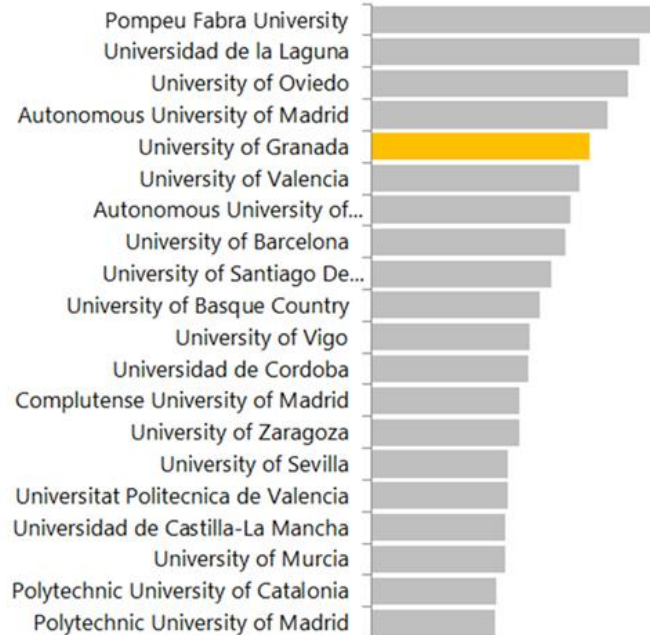


Combining fields and institutions

Nr of citable papers



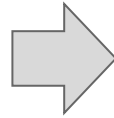
Category Normalized Citation Impact



In this example we can see the position of the University of Granada in the field of Natural Sciences according to two different bibliometric indicators.

Non bibliometric Indicators: funding

01	Production	<ul style="list-style-type: none">• Number of documents• Number of citable documents
02	Collaboration	<ul style="list-style-type: none">• Number of documents with international collaboration
03	Impact	<ul style="list-style-type: none">• % of papers in first quartile journals• Category Normalized Citation Impact
04	Excellence	<ul style="list-style-type: none">• % Highly Cited Papers• Papers in top journals



In order to complement the information provided by bibliometric indicators we can include information on other inputs

★ We use the number of projects and total funding in competitive programmes to contextualize our results. We consider two calls a) Spanish R&D National programmes and b) European funding from the European Commission.

★ **Nr. of project** and **total funding** are important indicators but also **success rate** (Nr of applications / Proposals selected for funding). It is important also to compare these indicators with national or UE average and do benchmarking with other institutions



Non bibliometric Indicators: funding

	Total Applications	Proposals selected for funding	Success Rate	Total Funding
UNIVERSIDAD DE BARCELONA	191	125	65%	13.194.445€
UNIVERSIDAD DE GRANADA	171	99	54%	8.533.404€
UNIVERSIDAD COMPLUTENSE DE MADRID	188	99	53%	9.422.754€
UNIVERSIDAD DE SEVILLA	189	91	48%	11.665.489€
..

- ★ In the University of Granada we focus on national research programmes. In this example we can see the results of four Spanish universities in the last year. We can see that the University of Granada is the second university in Spain with a larger number of projects conceded

Indicators at author level

		Nr of papers	H Index	Starting Year
Agriculture				
<i>AGRONOMY</i>	GARCIA DEL MORAL GARRIDO, LUIS FERNANDO	58	23	1988
Biology				
<i>ECOLOGY</i>	ZAMORA RODRIGUEZ, REGINO	121	40	1990
<i>ENVIRONMENTAL SCIENCES</i>	OLEA SERRANO, NICOLAS	221	41	1979
<i>FISHERIES</i>	DE LA HIGUERA, MANUEL	76	26	1988
<i>GENETICS & HEREDITY</i>	MARTINEZ CAMACHO, JUAN PEDRO	180	28	1980
<i>MICROBIOLOGY</i>	VALDIVIA, EVA	127	40	1981
<i>MICROBIOLOGY</i>	MAQUEDA ABREU, MERCEDES	103	36	1982
<i>ORNITHOLOGY</i>	SOLER CRUZ, MANUEL	152	32	1988
<i>ORNITHOLOGY</i>	MARTIN VIVALDI, MANUEL	54	18	1998
<i>ZOOLOGY</i>	SOLER CRUZ, MANUEL	152	32	1988
Health sciences				
<i>DENTISTRY & ORAL SURGERY MEDICINE</i>	TOLEDANO PEREZ, MANUEL	196	39	1995
<i>DENTISTRY & ORAL SURGERY MEDICINE</i>	OSORIO RUIZ, RAQUEL	235	37	1993
....

- ★ For authors we have included the researchers with the highest H-index in Web of Science for different scientific categories

Indicators at author level

TOP 50 INVESTIGADORES UGR

	Citas	h-index		
1	SERGIO NAVAS CONCHA	85045	70	Ciencias Exactas v Naturales
2	JUAN ANTONIO AGUILAR SAAVEDRA	71307	111	Ciencias Exactas v Naturales
3	FRANCISCO HERRERA TRIGUERO	53124	115	Ingeniería v Tecnología
4	ENRIQUE HERRERA VIEDMA	21740	72	Ingeniería v Tecnología
5	ANGEL GIL HERNANDEZ	21154	70	Ciencias de la Salud
6	EDUARDO BATTANER LOPEZ	20452	49	Ciencias Exactas v Naturales
7	NICOLAS OLEA SERRANO	14744	53	Ciencias de la Salud
8	ANTONIO BOLLIVAR BOTIA	14617	58	Ciencias Sociales v Jurídicas
9	ROBERTO PITTAJ	14386	47	Ciencias Exactas v Naturales
10	FRANCISCO B ORTEGA PORCEL	14018	63	Ciencias de la Salud
11	JONATAN RUIZ RUIZ	12948	66	Ciencias de la Salud
12	ANTONIO BUENO VILLAR	12698	57	Ciencias Exactas v Naturales
13	CARLOS MORENO CASTILLA	12211	54	Ciencias Exactas v Naturales
14	JOSE LUIS VERDEGAY GALDEANO	11765	47	Ingeniería v Tecnología
15	ANDREW STEPHEN KOWALSKI	11397	31	Ciencias Exactas v Naturales
16	OSCAR CORDON GARCIA	11287	50	Ingeniería v Tecnología
17	CARMEN BATANERO BERNABEU	11137	51	Ciencias Sociales v Jurídicas
18	DARIO ACUÑA CASTROVIEJO	10536	60	Ciencias de la Salud
19	JOSE RIVERA UTRILLA	10176	52	Ciencias Exactas v Naturales
20	ALBERTO FERNANDEZ GUTIERREZ	9955	49	Ciencias Exactas v Naturales
21	ANTONIO SEGURA CARRETERO	9808	50	Ciencias Exactas v Naturales
22	MANUEL JOAQUIN CASTILLO GARZON	9772	50	Ciencias de la Salud
23	REGINO ZAMORA RODRIGUEZ	9558	52	Ciencias Biológicas
24	JOSE GUTIERREZ PEREZ	9412	39	Ciencias Sociales v Jurídicas
25	JUAN DIAZ GODINO	9406	51	Ciencias Sociales v Jurídicas
26	SALVADOR GARCIA LOPEZ	8873	35	Ingeniería v Tecnología
27	JUAN DE DIOS LUNA DEL CASTILLO	8100	44	Ciencias Exactas v Naturales
28	MARIA AMPARO VILA MIRANDA	8043	48	Ingeniería v Tecnología
29	FATIMA OLEA SERRANO	7329	33	Ciencias de la Salud
30	GERMAINE ESCAMES ROSA	7271	50	Ciencias de la Salud
31	FRANCISCO DEL AGUILA GIMENEZ	7218	48	Ciencias Exactas v Naturales
32	MARIANA FATIMA FERNANDEZ CABRERA	6741	37	Ciencias de la Salud
33	JORGE CASTRO GUTIERREZ	6644	31	Ciencias Biológicas
34	JOSE MANUEL SANCHEZ RUIZ	6612	44	Ciencias Exactas v Naturales
35	JOSE LUIS VILCHEZ QUERO	6570	48	Ciencias Exactas v Naturales
36	JUAN LUPIANEZ CASTILLO	6558	43	Ciencias de la Salud
37	ROQUE HIDALGO ALVAREZ	6497	41	Ciencias Exactas v Naturales
38	MIGUEL CARLOS MOYA MORALES	6341	37	Ciencias Sociales v Jurídicas
39	ANGEL VICENTE DELGADO MORA	6323	39	Ciencias Exactas v Naturales
40	MANUEL LOZANO MARQUEZ	6275	29	Ingeniería v Tecnología
41	JUAN MANUEL DUARTE PEREZ	6205	43	Ciencias de la Salud
42	JOSE LUIS QUILES MORALES	6184	45	Ciencias de la Salud
43	VICENTE ENRIQUE CABALLO MANRIQUE	6180	37	Ciencias de la Salud
44	LUCAS ALADOS ARBOLEDAS	5977	42	Ciencias Exactas v Naturales
45	JUAN JULIAN MERELO GUERVOS	5958	31	Ingeniería v Tecnología
46	JUAN CARLOS BRAGA ALARCON	5850	43	Ciencias Exactas v Naturales
47	ENRIQUE RUIZ ARIOLA	5825	40	Ciencias Exactas v Naturales
48	JULIO JUAN GALVEZ PERALTA	5750	41	Ciencias de la Salud
49	ALEJANDRO FERNANDEZ BARRERO	5711	38	Ciencias Exactas v Naturales
50	JESUS GONZÁLEZ LÓPEZ	5539	41	Ciencias de la Salud

★ Finally, we include the most outstanding researchers in "Google Scholar Profiles". We review all profiles and only include those with correct information. We have analyzed a total of 2000 University of Granada profiles and approved 1,700. These profiles have been classified into five different scientific areas. In the report we present a summary of the 200 most cited researchers

[Link to google scholar profile](#)

Making data available online



Transparency and availability of data

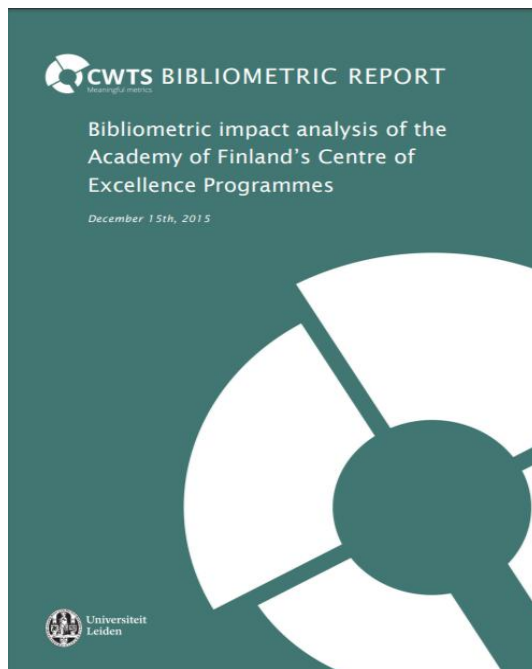
- ★ To promote institutional transparency, reproducibility, verification of results and data reuse by other departments, we share our data in an standardized way.
- ★ **Livemetrics Portal.** We have developed a portal that includes a dynamic version of the report with the main indicators



Examples and resources



Institutional reports



Bibliometric report for the Gurdon Institute and comparator research institutions

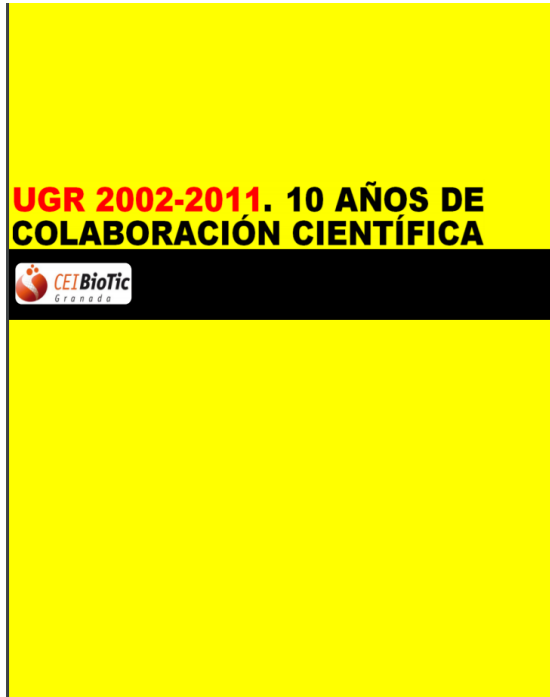
5th February 2013

Contact details

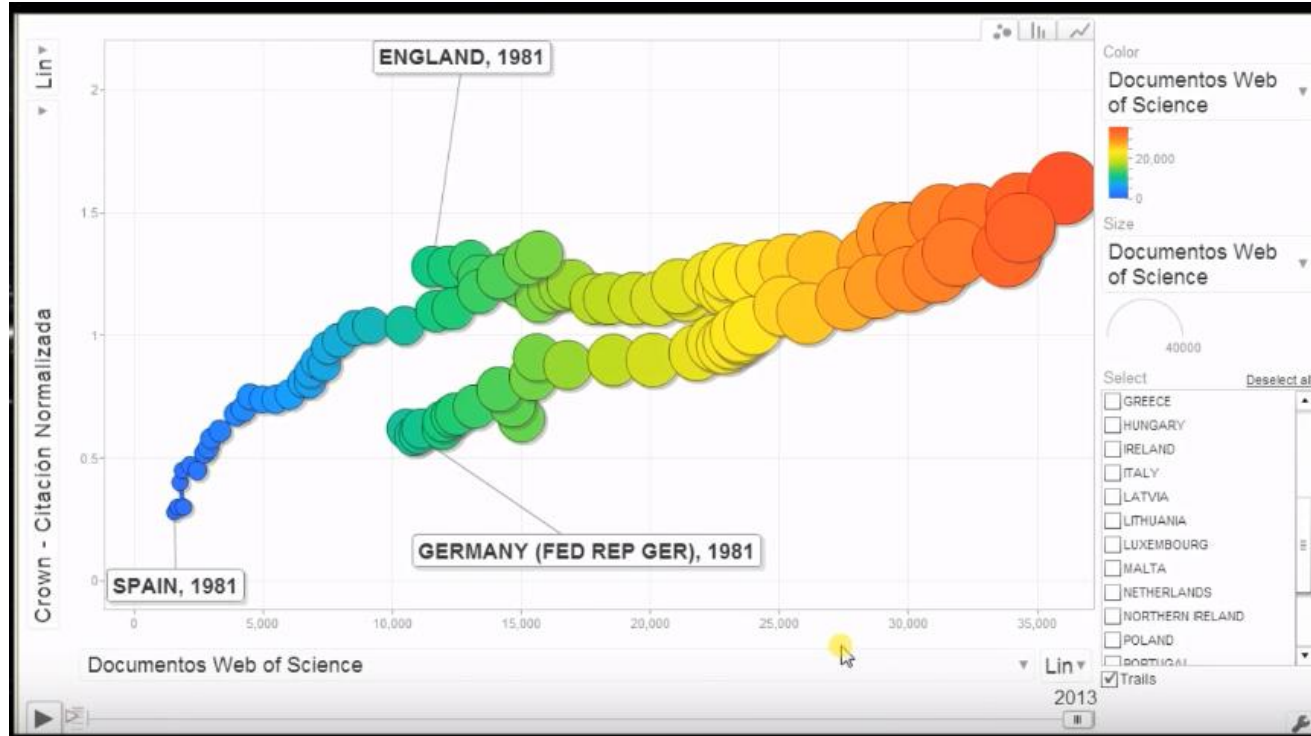
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Granada and Modena - Collaboration



Videoreports



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