Bibliometrics and science: importance of indicators in the research career

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SCIENTIFIC ACTIVITY

Peer Review

SCIENTIFIC PUBLICATION

Analysis of Publications

BIBLIOMETRICS

Peer Review

Quality control process by which experts evaluate scholarly works and ensure the high quality of published science

EDITORIAL BOARD

Journal Editor

- Establishes the editorial lines of the journal
- Assign the experts who should review the manuscripts
- Final decision on publication

Editorial Staff

- Receive manuscripts "candidates for publication"
- Coordinate the review
- Establish correspondence with the authors

Scientific Comitee

- Experts in the field
- Anonymous review of the manuscripts

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Peer Review

Authors
- Manuscript Submission

Journal Editor
- Manuscript checking

Editorial Staff
- Send the Manuscript to two experts of the Scientific comitee for review

Scientific Comitee

Expert 1 evaluation YES
Expert 2 evaluation YES → Accept the manuscript with the relevant change recommendations

Expert 1 evaluation YES
Expert 2 evaluation NO → Third expert or Editor evaluation "tiebreaker"

JOURNAL EDITOR FINAL DECISION

- Accepted manuscript
- Accepted with Minor changes
- Accepted after Major changes
- Revision and Resubmission
- Manuscript rejection

JOURNAL EDITOR FINAL DECISION

Author is informed about manuscript acceptation

Conventional Journal

Subscription
Peer Review
Copyright

Open Access Journal

Digital
Free access
Peer Review
No copyright
Article Processing Charges

≠

Predatory Journal

Fast publication/Peer Review?

SCIENTIFIC ACTIVITY

Peer Review

SCIENTIFIC PUBLICATION

Analysis of Publications

BIBLIOMETRICS

Bibliometrics

Use of statistical methods in the analysis of a body of literature to reveal the historical development of subject fields and patterns of authorship, publication and use.

(MeSH/Medline)

Evaluates scientific activity through the use of bibliometric indicators extracted from the publications considered as the final result of any investigation.

- Scientific activity information is obtained through the evaluation of research articles published in journals

- The basic source of information for bibliometric studies are the bibliographic databases

- WOS and Scopus are the main databases which provide the necessary information: affiliation of authors, references and citations of articles, and classification of journals by categories

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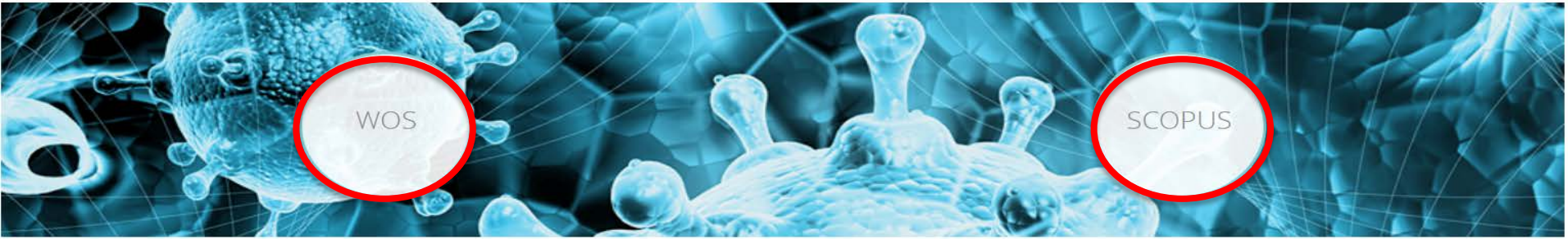

Indices de impacto

ABIERTO CURSOS DE FORMACIÓN PRESENCIAL

Formación

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BIBLIOMETRIC INDICATORS

1. Indicators of scientific productivity

2. Circulation and dispersion indicators

3. Collaboration indicators

4. Impact indicators

1. INDICATORS OF SCIENTIFIC PRODUCTIVITY

- **Number of articles produced by** an author, group, institution, country, field
- **Productivity Index (PI):** log of the number of published papers
- **Index of fractional productivity**: same as the PI but each published paper with *n* firms corresponds *1/n* points
- **Index of number of articles per inhabitant**
- **Index of number of articles by GDP**

2001-2017

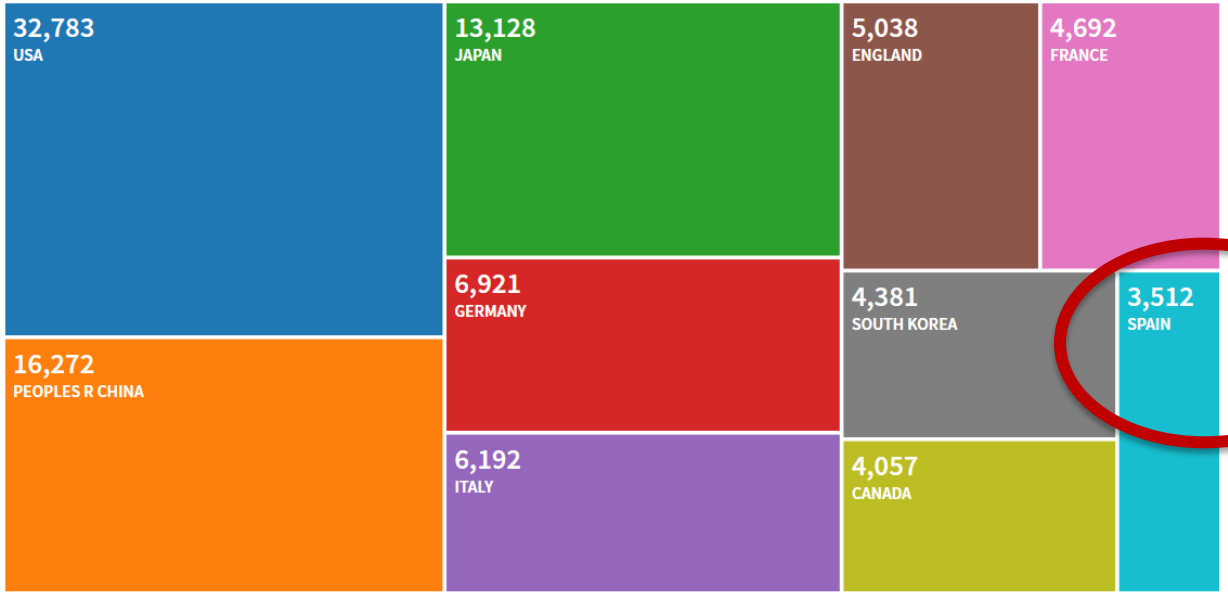
Showing 101,184 records for TOPIC: (("carcinoma* non small cell lung") OR ("lung carcinoma* non small cell") OR ("non small cell lung carcinoma*") OR ("non small cell lung cancer") OR ("cancer non small cell lung") OR ("squamous cell carcinoma*") OR ("carcinoma* squamous cell") OR ("epidermoid carcinoma*") OR ("carcinoma* epidermoid") OR ("adenocarcinoma") OR ("large cell carcinoma*") OR ("carcinoma* large cell"))

Citation report feature not available

Analysis: **WEB OF SCIENCE CATEGORIES:** (ONCOLOGY)

...Less

Visualization **Treemap** | Number of results **10** | Download | Hide



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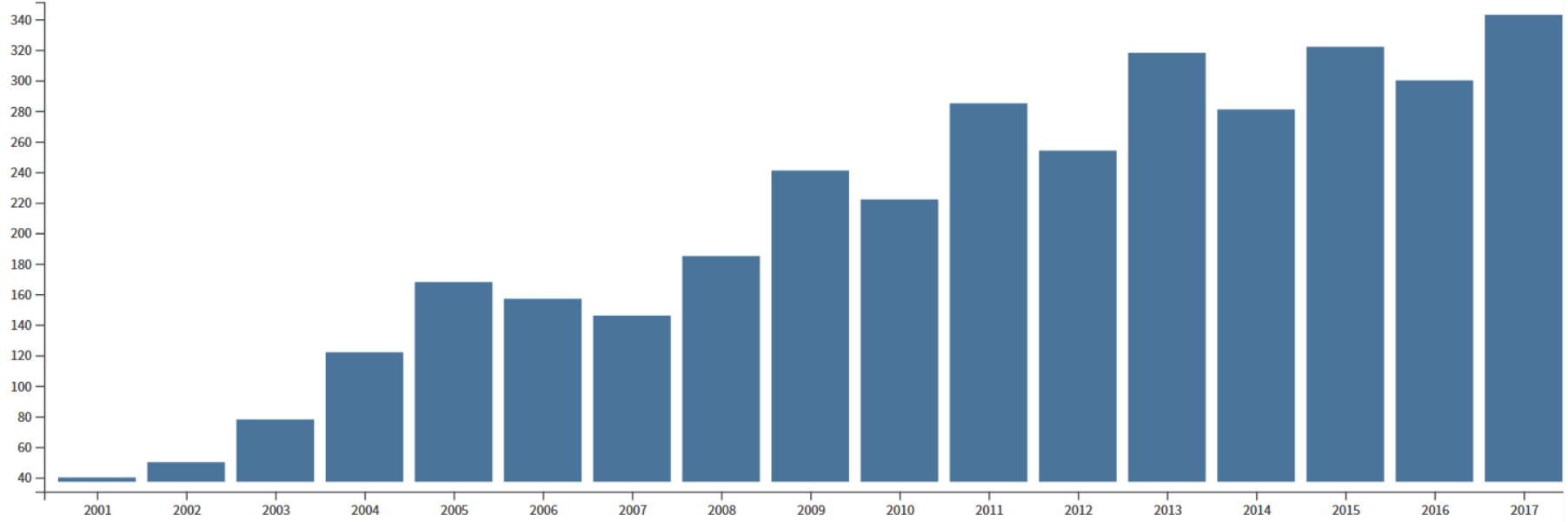
Chronological evolution of scientific production on NSCLC, according to the year of publication of the documents

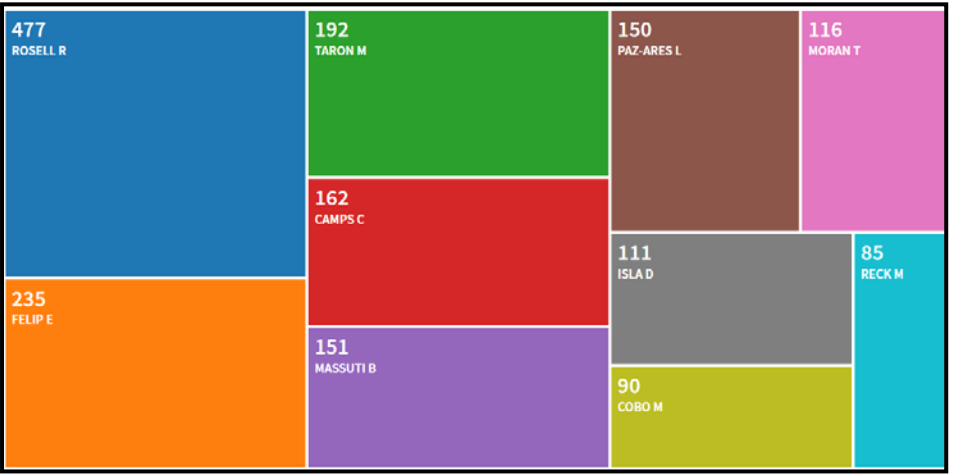
Total Publications

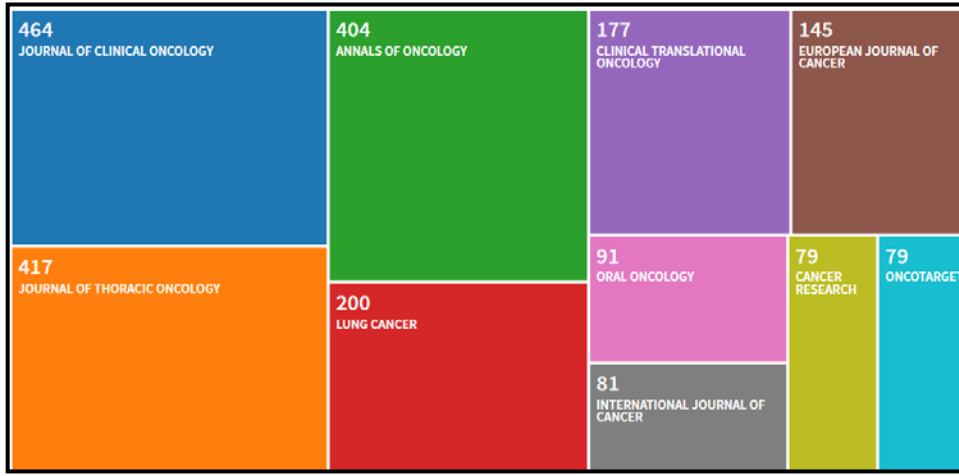
3.512 Analyze



The productivity of the authors measured by the number of their publications

Authors ← Spain 2001-2017 → Journals





- **Small producers** 1 paper → **IP = 0**
- **Medium producers** 2-9 papers → **0 > IP < 1**
- **Large producers** ≥10 papers → **IP≥1**

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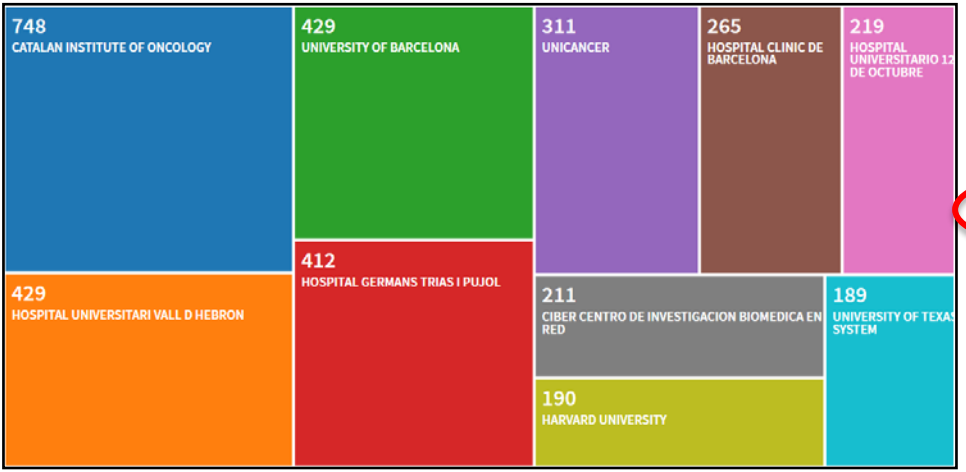
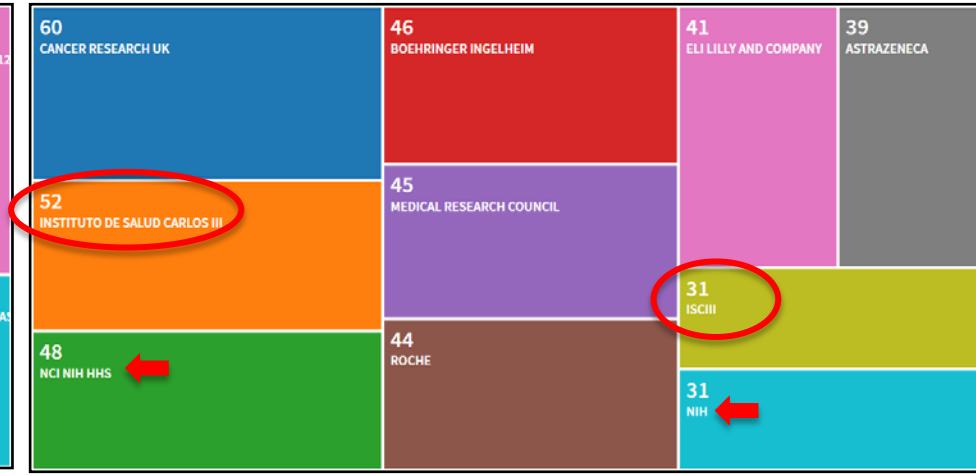
Spain 2001-2017

Organizations



Funding Agencies



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LIMITATIONS OF PRODUCTIVITY INDICATORS

- Not all knowledge is included in published articles.
- It does not evaluate other non-formal methods of communication in science.
- There are numerous defects in the form of bibliographic databases.
- The number of publications does not provide an idea of their quality.
- There are social and political pressures that require publication to increase the CV: "publish or perish"

2. CIRCULATION AND DISPERSION INDICATORS

- **Circulation Indicators:** It is necessary to verify every year the effective circulation of each journal by means of the computation of works really included

- **Dispersion Indicators**: Identify the core of publications where the most important production of a topic is concentrated.

3. COLLABORATION INDICATORS (authors, institutions, countries)

- **Number of articles in co-authorship:** signed by more than 1 author
- **Co-authorship or Collaboration Index:** index of signatures per work

- **Collaboration networks**

Formation of clusters of authors and institutions: set of nodes (authors) connected to each other through links (co-authorship relationships)

4. IMPACT INDICATORS

- Assumption that the important papers are usually cited, while the irrelevant ones are ignored and not cited.

- **Cites per article**
- **JIF, SJR, Citescore**
- **h-index**
- Usage, captures, mentions, social media and citations,…

- Number of citations received by an article, author, journal, country, etc.

- **Visibility index**

Logarithm of citations received

Web of Science InCites Journal Citation Reports Essential Science Indicators EndNote Publons Kopernio

Web of Science

NSCLC, Spain, Oncology, 2001-2017

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Link to Full Text · Look Up Full Text · Full Text Options · Save to EndNote online · Add to Marked List · 1 of 1,801

Eriotinib versus standard chemotherapy as first-line treatment for European patients with advanced EGFR mutation-positive non-small-cell lung cancer (EURTAC): a multicentre, open-label, randomised phase 3 trial

By: Rosell, R (Rosell, Rafael)[1,52]; Carcereny, E (Carcereny, Enric)[52]; Gervais, R (Gervais, Radj)[2]; Vergnenegre, A (Vergnenegre, Alain)[3]; Massuti, B (Massuti, Bartomeu)[4]; Felip, E (Felip, Enriqueta)[5]; Palmero, R (Palmero, Ramon)[6]; Garcia-Gomez, R (Garcia-Gomez, Ramon)[7]; Pallares, C (Pallares, Cinta)[8]; Sanchez, JM (Miguel Sanchez, Jose)[9,10] ...More

Group Author(s): Grp Francais Pneumocancerologie; Assoc Italiana Oncologia Toracica

View ResearcherID and ORCID

LANCET ONCOLOGY
Volume: 13 Issue: 3 Pages: 239-246
DOI: 10.1016/S1470-2045(11)70393-X
Published: MAR 2012
Document Type: Article
View Journal Impact

Abstract

Background Eriotinib has been shown to improve progression-free survival compared with chemotherapy when given as first-line treatment for Asian patients with non-small-cell lung cancer (NSCLC) with activating EGFR mutations. We aimed to assess the safety and efficacy of eriotinib compared with standard chemo therapy for first-line treatment of European patients with advanced EGFR-mutation positive NSCLC.

Methods We undertook the open-label, randomised phase 3 EURTAC trial at 42 hospitals in France, Italy, and Spain. Eligible participants were adults (>18 years) with NSCLC and EGFR mutations (exon 19 deletion or L858R mutation in exon 21) with no history of chemotherapy for metastatic disease (neoadjuvant or adjuvant chemotherapy ending >= 6 months before study entry was allowed). We randomly allocated participants (1: 1) according to a computer-generated allocation schedule to receive oral eriotinib 150 mg per day or 3 week cycles of standard intravenous chemotherapy of cisplatin 75 mg/m(2) on day 1 plus docetaxel (75 mg/m(2) on day 1) or gemcitabine (1250 mg/m(2) on days 1 and 8). Carboplatin (AUC 6 with docetaxel 75 mg/m(2) or AUC 5 with gemcitabine 1000 mg/m(2)) was allowed in patients unable to have cisplatin. Patients were stratified by EGFR mutation type and Eastern Cooperative Oncology Group performance status (0 vs 1 vs 2). The primary endpoint was progression-free survival (PFS) in the intention-to-treat population. We assessed safety in all patients who received study drug (>= 1 dose). This study is registered with ClinicalTrials.gov, number NCT00446225.

Findings Between Feb 15, 2007, and Jan 4, 2011, 174 patients with EGFR mutations were enrolled. One patient received treatment before randomisation and was thus withdrawn from the study; of the remaining patients, 86 were randomly assigned to receive eriotinib and 87 to receive standard chemotherapy. The preplanned interim analysis showed that the study met its primary endpoint; enrolment was halted, and full evaluation of the results was recommended. At data cutoff (Jan 26, 2011), median PFS was 9.7 months (95% CI 8.4-12.3) in the eriotinib group, compared with 5.2 months (4.5-5.8) in the standard chemotherapy group (hazard ratio 0.37, 95% CI 0.25-0.54; p<0.0001). Main grade 3 or 4 toxicities were rash (11 [13%] of 84 patients given eriotinib vs none of 82 patients in the chemotherapy group), neutropenia (none vs 18 [22%]), anaemia (one [1%] vs three [4%]), and increased aminotransferase concentrations

Citation Network

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24 Cited References

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Most recently cited by:

Xu, Yanjun; Tong, Xiaoling; Yan, Junrong; et al.
Short-Term Responders of Non-Small Cell Lung Cancer Patients to EGFR Tyrosine Kinase Inhibitors Display High Prevalence of TP53 Mutations and Primary Resistance Mechanisms.
TRANSLATIONAL ONCOLOGY (2018)

Bronte, Giuseppe; Bravaccini, Sara; Bronte, Enrico; et al.
Epithelial-to-mesenchymal transition in the context of epidermal growth factor receptor inhibition in non-small-cell lung cancer.
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NSCLC, Spain, Oncology, 2001-2017

Web of Science

Citing Articles: 2,359

Cited References: 24

Related Records: 26,112

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Xu, Yanjun; Tong, Xiaoling; Yan, Junrong; et al. Short-Term Responders of Non-Small Cell Lung Cancer Patients to EGFR Tyrosine Kinase Inhibitors Display High Prevalence of TP53 Mutations and Primary Resistance Mechanisms. TRANSLATIONAL ONCOLOGY (2018)
Bronte, Giuseppe; Bravaccini, Sara; Bronte, Enrico; et al. Epithelial-to-mesenchymal transition in the context of epidermal growth factor receptor inhibition in non-small-cell lung cancer. BIOLOGICAL REVIEWS (2018)
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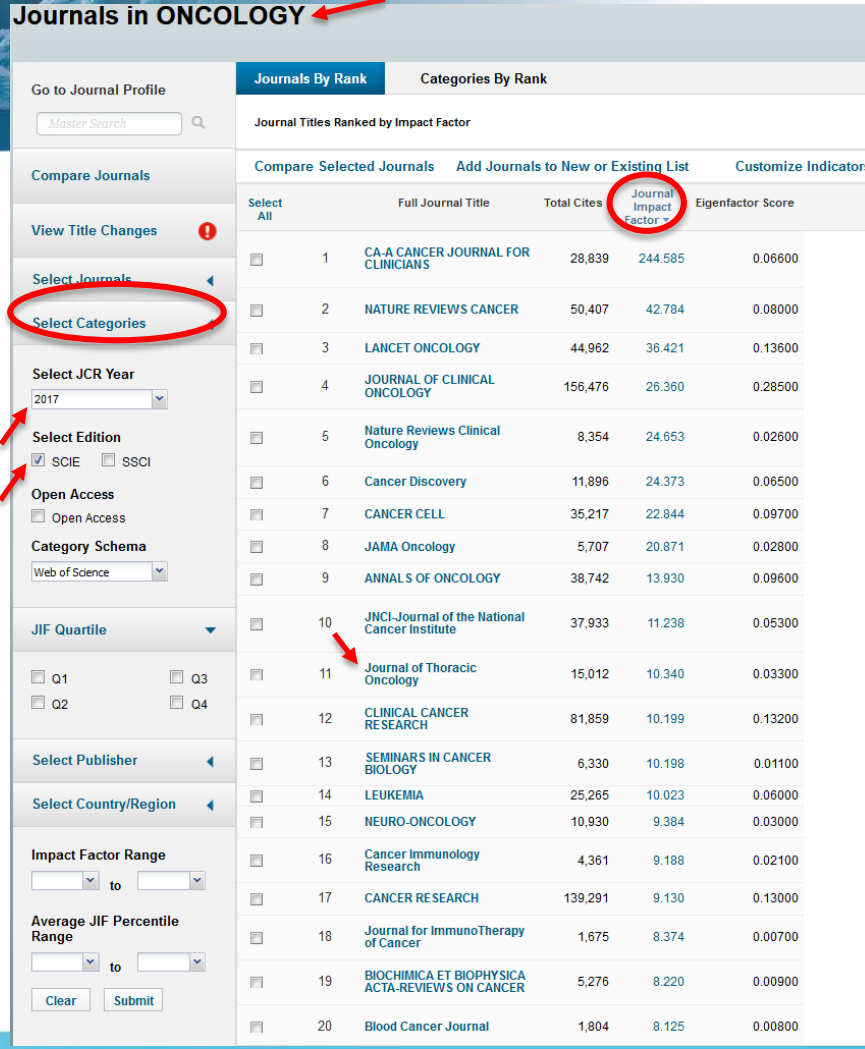
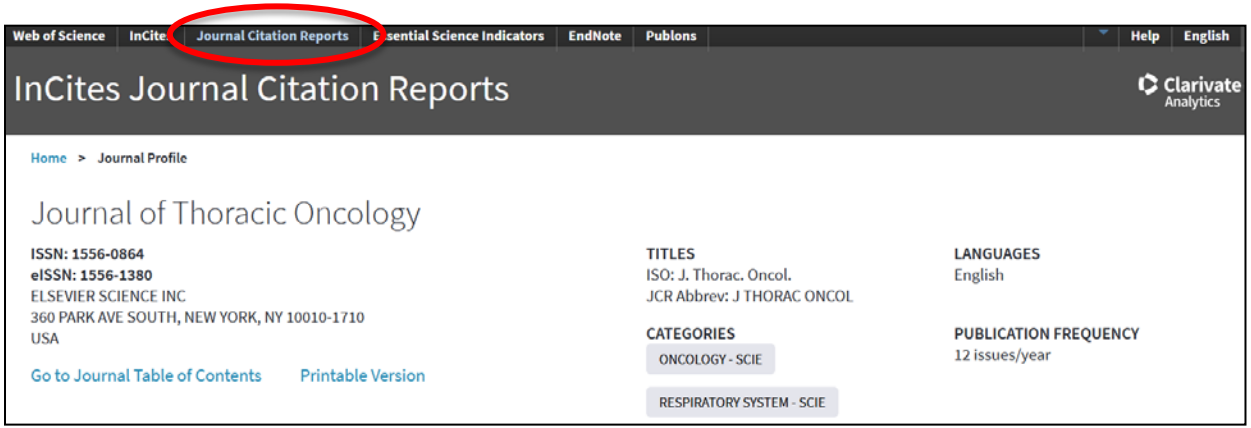
JOURNAL IMPACT FACTOR

- Measures the quality and prestige of journals
- It is based on the recognition of the value of publications for the scientific community through the citations they receive
- Since the journal is the main vehicle for the transmission of knowledge, JIF is used to evaluate the scientific activity of researchers, groups and institutions:
  For professional promotion - To obtain projects and grants



JOURNAL IMPACT FACTOR

- The **JIF** is calculated in each journal establishing the relationship between the citations that have received in 1 year the articles published during the previous 2 years, and the total of articles published in it during those 2 years



Journal Impact Factor Calculation

$$\text{2017 Journal Impact Factor} = \frac{4{,}498}{435} = 10.340$$

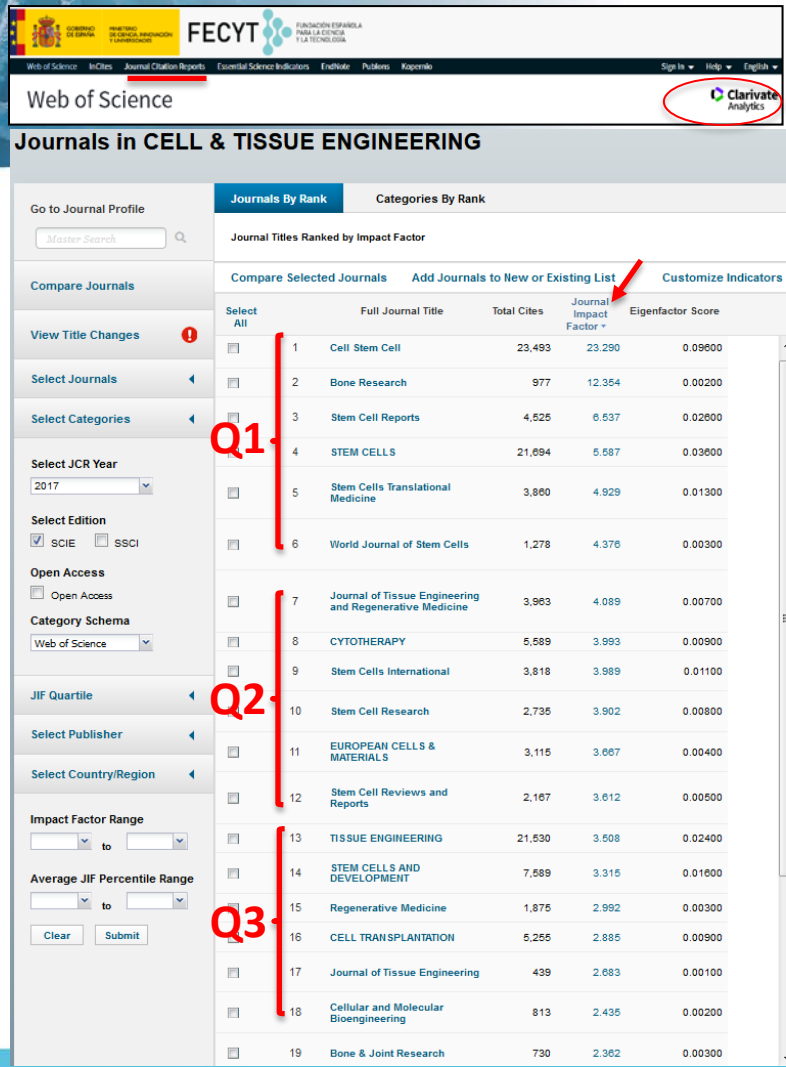
How is Journal Impact Factor Calculated?

$$\text{JIF} = \frac{\text{Citations in 2017 to items published in } \mathbf{2015\ (2231) + 2016\ (2267)}}{\text{Number of citable items in } \mathbf{2015\ (229) + 2016\ (206)}} = \frac{4{,}498}{435}$$

The classification of journals by "quartiles"

- The division of the set of journals in a Category of the JCR ordered by its JIF in 4 parts gives rise to the "quartiles" (Q). Journals with higher FI are in the first quartiles

- In many evaluation systems of academic-scientific activity only articles published in journals of the first or second quartile are positively evaluated.



LIMITATIONS OF THE USE OF THE JOURNAL IMPACT FACTOR

- The IFs of a journal are not representative of their individual articles.
- Review articles are highly cited, inflating the journal's IF.
- The IF is affected by the visibility and accessibility of the journal and its articles.
- The database used to calculate the IF has an incomplete coverage, dominated by American publications and with a bias in favor of the english language.
- The IF of journals of different disciplines can not be compared.
- The reduced research fields do not usually have high IF journals.

Key Indicators 2017

Year	2017	5 Year Impact Factor	7,296	Cited Half-Life	4,4	Article Influence Score	2,032	Average JIF Percentile	94,729
Total Cites	15.012	Immediacy Index	5,173	Citing Half-Life	4,3	% Articles in Citable Items	89,60		
Journal Impact Factor	10,340	Citable Items	173	Eigenfactor Score	0,03300	Normalized Eigenfactor	3,89000		
Impact Factor Without Journal Self Cites	9,712								

EIGENFACTOR SCORE

It is calculated from citations that have received, in a given year, the works published in the last 5 years, but taking into account that the highly cited journals have more influence than the less cited ones.

The idea is that it should not matter just how much they quote us, but who and how they do it

SCIMAGO JOURNAL RANK

- The **SJR** is calculated in each journal establishing the relationship between the **weighted citations** that have received in 1 year the works published during the previous 3 years, and the total of articles published in it during those 3 years

- Unlike the impact factor of JCR, SJR is weighted by the prestige of the journals that cite

https://www.scimagojr.com/

CITESCORE

Number of citations received by a journal in one year to its documents published in the previous 3 years, divided by the total of documents published by the journal in those 3 previous years.

Scopus

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Source details

Journal of Clinical Oncology

Scopus coverage years: from 1983 to Present

Publisher: American Society of Clinical Oncology

ISSN: 0732-183X E-ISSN: 1527-7755

Subject area: Medicine: Oncology Biochemistry, Genetics and Molecular Biology: Cancer Resea

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CiteScore 2017
10.51

SJR 2017
10.683

SNIP 2017
5.147

Citations in 2017

Documents from 3 years

2013 2014 2015 2016 2017 2018

CiteScore CiteScore rank & trend Scopus content coverage

CiteScore 2017

Calculated using data from 30 April, 2018

10.51 = Citation Count 2017 / Documents 2014 - 2016* = 27.777 Citations / 2.642 Documents

*CiteScore includes all available document types

View CiteScore methodology CiteScore FAQ

CiteScore rank

Category

Medicine
Oncology

https://www.scopus.com

h-index (Hirsch,2005)

- It is the number of published papers by a researcher (*h*) which have been cited at least *h* times by other papers.

It can only increase or stay stagnant
It allows extrapolating the output of a scientist in the medium term
It allows to compare careers of scientists of different ages
Does not count the quality of the publication journals
Does not count the quality of the citing journals
It differs according to the database used for its calculation

Altmetrics-Social communication

NSCLC, Spain, Oncology, 2001-2017

PLUMX

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Erlotinib versus standard chemot...

Embed Widget

Erlotinib versus standard chemotherapy as first-line treatment for European patients with advanced EGFR mutation-positive non-small-cell lung cancer (EURTAC): a multicentre, open-label, randomised phase 3 trial.

Citation data: The Lancet. Oncology, ISSN: 1474-5488, Vol: 13, Issue: 3, Page: 239-46
Publication Year: 2012

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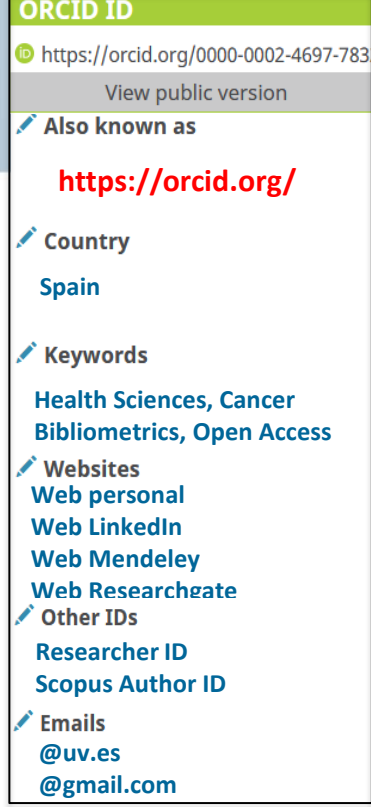

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THANKS FOR YOUR ATTENTION

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