

INTRODUCTION TO SCIENTOMETRICS

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Workshop Objectives

- Definitions & Concepts
- Importance & Applications
- Citation Databases
- Basic Scientometric Indices
- Iranian Scientometric Information Database
- Journal Impact Factor, Journal Citation Reports
- CiteScore, SNIP, SJR
- New Scientometric Tools & Indices
- Citation Analysis & Scientometric Reports
- Researcher Profile Services

Definition

- **Scientometrics** is the study of **measuring** and **analyzing** science, technology and innovation.
- **Scientometrics** is the measurement of scientific **output**, and the **impact** of scientific findings.

History

Modern Scientometrics is mostly based on the work of **Eugene Garfield** creator and founder of the **Science Citation Index** and the Institute for Scientific Information (**ISI**) which is heavily used for scientometric analysis.

Leydesdorff, L. and Milojevic, S., "Scientometrics" in: Lynch, M. (editor), *International Encyclopedia of Social and Behavioral Sciences* subsection 85030. (2015)

Scientometrics Variables

- Authors
- Publications
- References
- Citations

Importance & Applications

- Grant / Funding Allocations
- Benchmarking
- Research Priorities
- Scientific Collaboration Models
- Research Ranking
- Policy Decisions
- Science Mapping
- Academic Promotion
- Collection management

Levels of Scientometric Studies

- **Microlevel**

Individuals, Groups

- **Mesolevel**

Universities, Institutions, Journals

- **Macrolevel**

National, Regional, Global

Citation Databases

- ISI Web of Science
- Scopus
- Google Scholar

ISI WoS Content Coverage

- 12,000 journals
- 160,000 conference proceedings
- Coverage dating back to 1900
- More than 250 disciplines

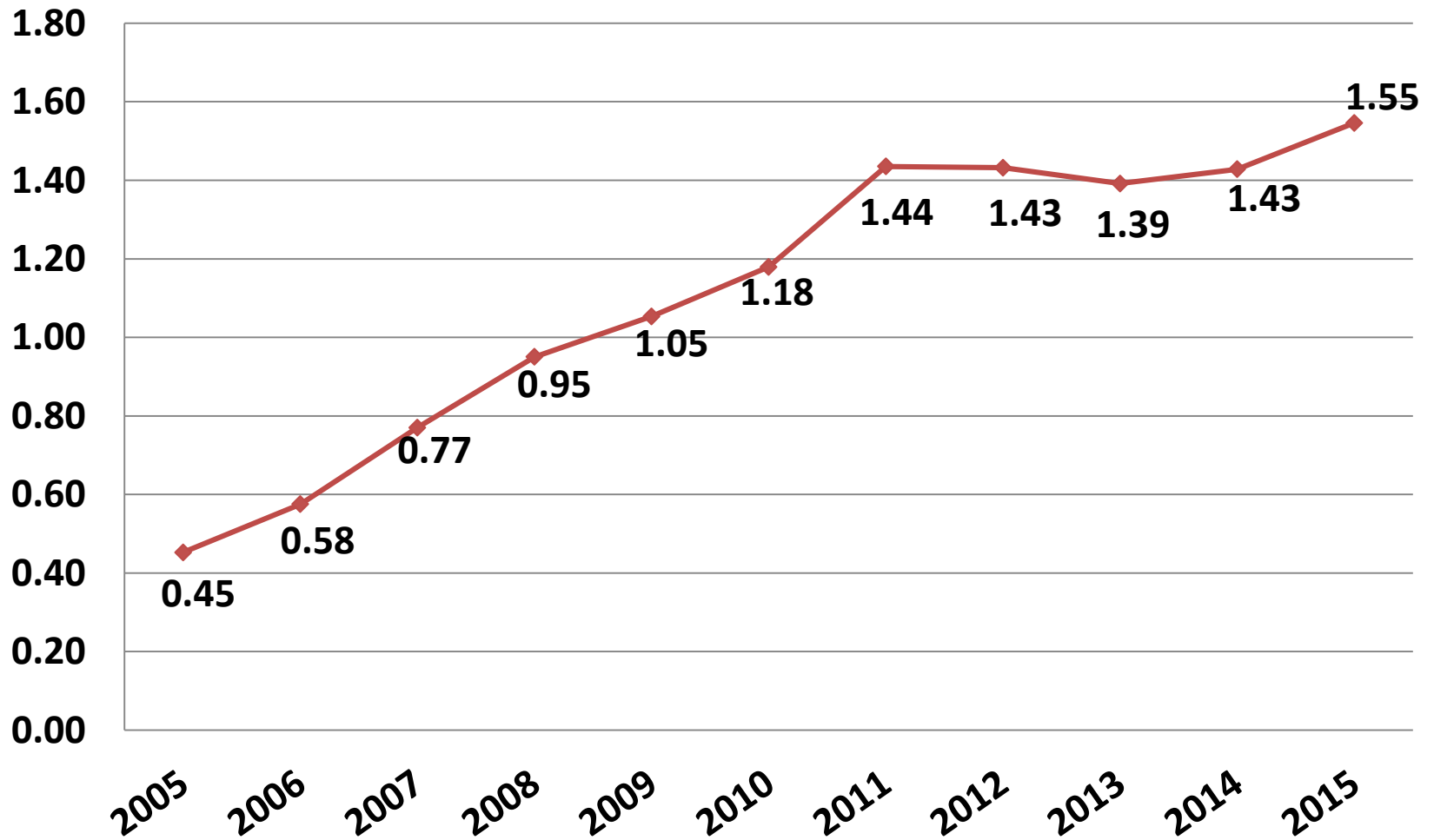
ISI WOS Core Collection

- Science Citation Index Expanded (**SCI-EXPANDED**): 1983-present
- Social Sciences Citation Index (**SSCI**): 1983-present
- Arts & Humanities Citation Index (**A&HCI**): 1983-present
- Emerging Sources Citation Index (**ESCI**): 2015-present
- Conference Proceedings Citation Index- Science (**CPCI-S**): 1990-present
- Conference Proceedings Citation Index- Social Science & Humanities (**CPCI-SSH**): 1990-present

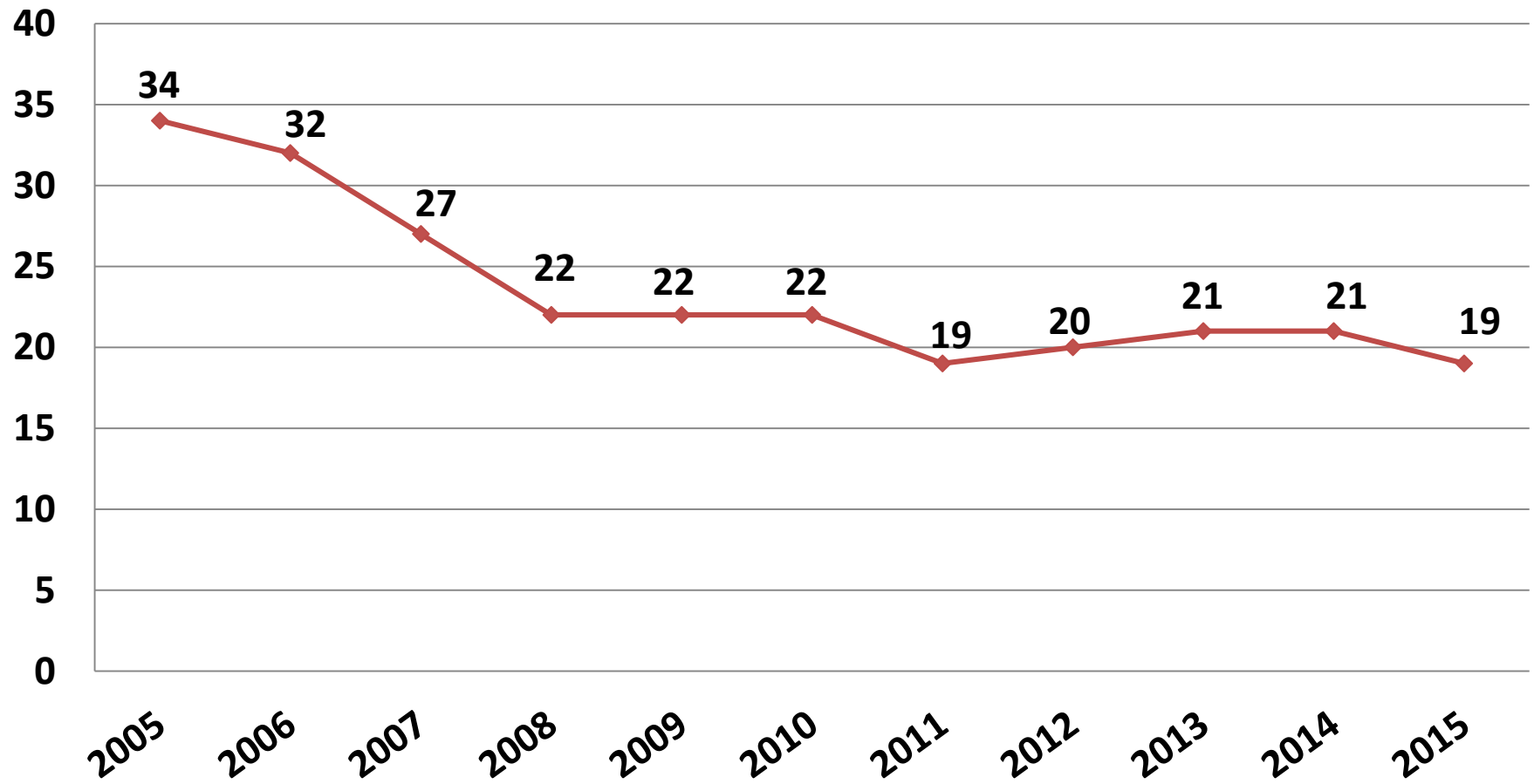
Scopus Content Coverage

- More than 66 million records
- Over 22,700 peer-reviewed journals
- More than 4,470 are full open access
- Over 558 book series including 34,000 individual book volumes
- More than 138,000 non-serial books and 20,000 added each year

Iran Contribution to World Science



Iran Science Production Rank in ISI



Top Regional Countries: Comparison of Science Production in ISI

Country	2012	2013	2014	2015	2016*
Turkey	33289	36392	37568	43847	46458
Iran	30698	31136	33416	38255	45131
Saudi Arabia	9376	11792	14518	17461	18995
Egypt	9321	10417	11779	13955	16063

Iranian Scientometric Information Databse

ردیف	نام و نام خانوادگی	دانشگاه علوم پزشکی / سازمان	مقطع / رشته	مرتبۀ علمی	مقالات	استنادات	H-Index	استناد بازی هر مقاله
۱	رضا ملک زاده	تهران	دکترای فوق تخصصی بالینی / گوارش و کبد بالغین	استاد ممتاز	۴۹۱	۲۲۱۳۹	۶۰	۴۵/۰۹
۲	محمد عبداللہی	تهران	دکترای تخصصی (PhD) داروسازی / سم شناسی داروشناسی	استاد	۶۹۴	۱۴۴۴۳	۵۹	۲۰/۸۱
۳	فریدون عزیزی	شہید بهشتی	دکترای فوق تخصصی بالینی / غدد درون ریز و متابولیسم بالغین	استاد	۹۱۴	۱۴۰۴۴	۵۶	۱۵/۳۷
۴	محمود رفیعیان کویایی	شہرکرد	دکترای تخصصی (PhD) داروسازی / داروشناسی	استاد	۳۴۰	۷۰۵۸	۵۲	۲۰/۷۶
۵	باقر لاریجانی	تهران	دکترای فوق تخصصی بالینی / غدد درون ریز و متابولیسم بالغین	استاد ممتاز	۷۶۸	۹۳۰۳	۴۴	۱۲/۱۱
۶	مرتضی محمودی	تهران	دکترای تخصصی (PhD) / نانوفناوری پزشکی	استادیار	۱۶۲	۷۷۵۶	۴۳	۴۷/۸۸
۷	رویا کلیشادی	اصفہان	دکترای تخصصی پزشکی / کودکان	استاد	۴۶۷	۷۱۷۴	۴۳	۱۵/۳۶
۸	حسین حسین زاده	مشہد	دکترای تخصصی (PhD) داروسازی / داروشناسی	استاد	۲۴۰	۵۷۰۱	۴۲	۲۳/۷۵
۹	شاهین آخوندزاده بستی	تهران	دکترای تخصصی (PhD) / علوم اعصاب	استاد	۲۷۸	۵۱۸۴	۴۲	۱۸/۶۵
۱۰	نیما رضائی	تهران	دکترای تخصصی (PhD) / ایمنی شناسی	دانشیار	۵۷۳	۷۱۰۸	۴۱	۱۲/۴

Types of Scientometric Indices

- Quantitative Indices
- Qualitative Indices
- Quantitative-Qualitative Indices

Scientometrics Indices

- Scientific Productivity
- Citations
- Immediacy Index
- Cited half life
- Highly Cited
- Citation per Paper
- H-Index
- M-Index
- G-Index
- FWCI

H-Index

- The h-index was suggested in 2005 by Jorge E. Hirsch, an American physicist.
- The h-index is a measurement that aims to describe the scientific productivity and impact of a researcher.
- The h-index is defined by how many **h** of a researcher's publications each have at least **h** citations.

Journal Impact Factor (JIF)

- The average number of citations received in a year by articles published in that journal during the two preceding years.
- JIF was devised by Eugene Garfield, the founder of the ISI to compare journals.
- JIFs are calculated yearly starting from 1975.

Journal Citation Reports (JCR)

Journal Impact Factors are calculated and released annually by one of the most important and useful **ISI** databases called **J**ournal **C**itation **R**eports.

CiteScore

- **CiteScore** is the new journal evaluation metrics proposed by Elsevier.
- The concept is the same as *Impact Factor*.
- It's a **3 years** period of time index



SCImago Journal Rank (SJR)

- SJR is normalized by the total number of citations in the citing journal for the year in question.
- Each journal is a node and each directed connection is a normalized value of the number of citations from one journal to another over a three year window.

SCImago vs JCR

- Source of data
- Coverage
- Algorithm
- Access
- Application

Source Normalized Impact Per Paper (SNIP)

- SINP normalizes the different **fields** based on the citing-side form of normalization, rather than normalizing with respect to the just **total citations** a journal receives.
- SINP normalizes with respect to the number of **references** in the citing journals.

<http://www.journalmetrics.com/>

Journal Metrics

Powered by **Scopus**

Journal Search

Search

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Welcome to Journal Metrics from Elsevier

The academic community has long been demanding more transparency, choice and accuracy in journal assessment. Elsevier now provides three alternative, transparent and accurate views of the true citation impact a journal makes:

- [Source Normalized Impact per Paper \(SNIP\)](#)
- [The Impact per Publication \(IPP\)](#)
- [SCImago Journal Rank \(SJR\)](#)

The three different impact metrics are all based on methodologies developed by external bibliometricians and use Scopus as the data source. [Scopus](#) is the largest citation database of peer-reviewed literature and features tools to track, analyze and visualize research output. Via this website, the three journal metrics are provided free of charge.

About Journal Metrics



Journal Search

Search the entire collection of journals covered by Scopus along with their SNIP, IPP and SJR metrics going back to 1999.

Journal title keyword

Start Year

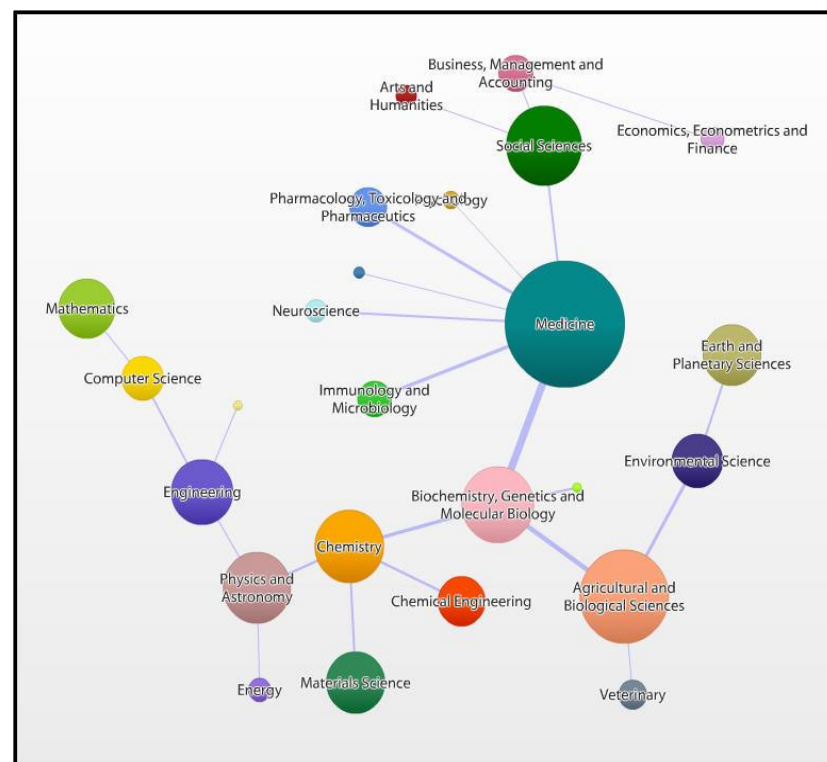
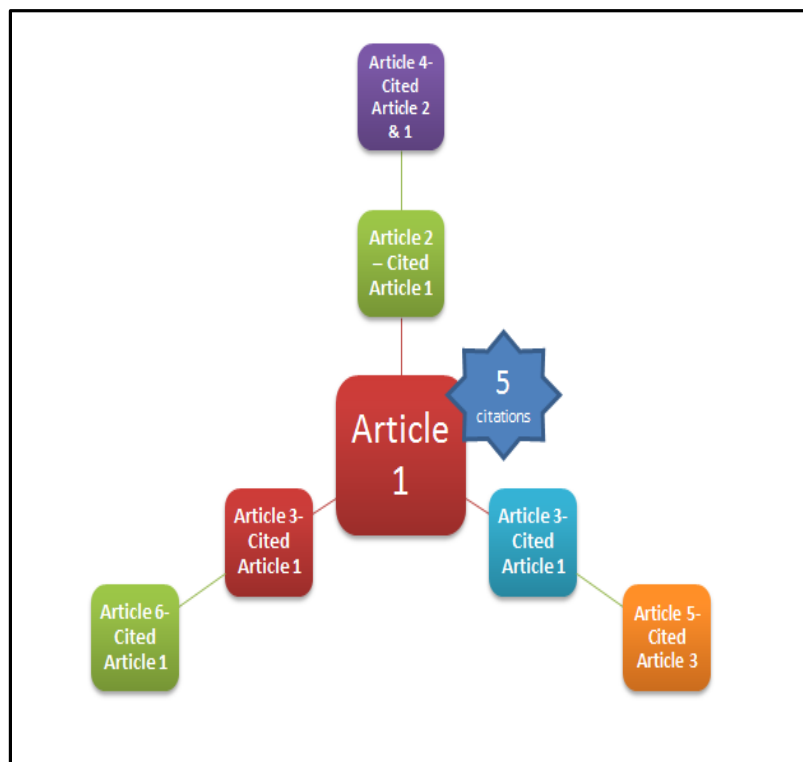
Start Year ▼

About IPP

The Impact per Publication measures the ratio of citations per article published in the journal.

The Impact per Publication measures the ratio of citations in a year (Y) to scholarly papers published in the three previous years (Y-1, Y-2, Y-3) divided by the

Citation Analysis & Scientometric Reports



SciVal

Welcome to SciVal



Overview

Get a high-level overview of the research performance of your Institution, other Institutions, Countries and Groups of Researchers.

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Compare and benchmark your Institution to other Institutions, Researchers and Groups of Researchers using a variety of metrics.

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FIELD-WEIGHTED CITATION IMPACT (FWCI)

of citations received by a document
expected # of citations for similar documents

Similar documents are ones in the same discipline, of the same type (e.g., article, letter, review) and of the same age. An FWCI of 1 means that the output performs just as expected against the global average. More than 1 means that the output is more cited than expected according to the global average; for example, 1.48 means 48% more cited than expected.



Altmetrics: Using Big Data to Measure Scholarly Impact



A way to measure the impact of a scholarly article or project by charting social media mentions as well as blog posts and bookmarks.

Why Altmetrics?

- **NO ONE CAN READ EVERYTHING.**
- We rely on filters to make sense of the scholarly literature, but the narrow, traditional filters are being swamped.
- The growth of new, online scholarly tools allows us to make new filters
- Altmetrics reflect the broad, rapid impact of scholarship in this burgeoning ecosystem.
- We call for more tools and research based on altmetrics.

Researcher Profile Services

- Services through which researchers can set their own academic CV's & profiles.
- Increasing the visibility of researchers and their work
- Choosing to be public or private in some services
- Many universities have their own RPS.
- Auto vs Manual generation

Top Researcher Profile Services

- 1) ORCID
- 2) Scopus Author ID
- 3) ResearcherID
- 4) Google Scholar Citations

ORCID

<orcid.org>

- ORCID (Open Researcher and Contributor ID) is a registry of persistent unique identifiers for researchers. (Over 3,500,000 IDs)
- As an international, interdisciplinary, open and not-for-profit organization, ORCID was created in 2010 for the benefit of research organizations, research funders, publishers and researchers.

DISTINGUISH YOURSELF IN THREE EASY STEPS

ORCID provides a persistent digital identifier that distinguishes you from every other researcher and, through integration in key research workflows such as manuscript and grant submission, supports automated linkages between you and your professional activities ensuring that your work is recognized. [Find out more.](#)

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Registration takes 30 seconds.

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**ADD YOUR
INFO** Enhance your ORCID record with your
professional information and link to your other
identifiers (such as Scopus or ResearcherID or
LinkedIn).

3

**USE YOUR
ORCID ID** Include your ORCID identifier on your Webpage,
when you submit publications, apply for grants, and
in any research workflow to ensure you get credit
for your work.



LATEST NEWS

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Wed 11/02/2016
[Another year for
ORCID, another
Public Data File for
the Community.](#)

Mon 10/31/2016
[Organization
identifier project: A
way forward](#)

ResearcherID

<<http://www.researcherid.com>>

- ResearcherID is an identifying system for scientific authors.
- The system was introduced in January 2008 by Thomson Reuters.
- A unique identifier consists of alphanumeric characters, each number contains the year in which you registered.
- Example: A-9873-2013

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Highly Cited Research

This resource captures the people behind the most influential publications in 21 broad subject categories based on citation metrics. Learn more about the methodology. List your current affiliation in ResearcherID to ensure your

What is ResearcherID?

ResearcherID provides a solution to the author ambiguity problem within the scholarly research community. Each member is assigned a unique identifier to enable researchers to manage their publication lists, track their times cited counts and h-index, identify potential collaborators and avoid author misidentification. In addition, your ResearcherID information integrates with the *Web of Science* and is ORCID compliant, allowing you to claim and showcase your publications from a single one account. Search the registry to find collaborators, review publication lists and explore how research is used around the world!

Top Keywords

Find researchers based on your area of interest.

adsorption aging analytical chemistry artificial intelligence biochemistry biodiversity biogeochemistry biogeography
bioinformatics biomaterials biomechanics biophysics biosensors biotechnology breast cancer cancer
cancer biology carbon nanotubes catalysis chemistry climate change computational biology computational
chemistry computer vision condensed matter physics conservation conservation biology data mining diabetes drug delivery
ecology education electrochemistry energy epidemiology epigenetics evolution fluid mechanics genetics
genomics geochemistry gis graphene hydrology image processing immunology inflammation innovation
inorganic chemistry knowledge management machine learning management marketing mass spectrometry medicinal
chemistry microbiology microfluidics molecular biology molecular dynamics nanomaterials nanoparticles
nanotechnology neural networks neuroscience nonlinear optics nutrition obesity optimization organic

Google Scholar Citations

<<http://scholar.google.com/citations>>

- A service provided by Google.
- A simple way for authors to keep track of **citations** to their articles.
- Researchers can check who is **citing** their publications
- Computing several **citation** metrics.
- Quick to set up and simple to maintain



Reza Malekzadeh

Professor of Internal Medicine , Tehran University of Medical Sciences, Iran

Digestive oncology, Chronic liver disease

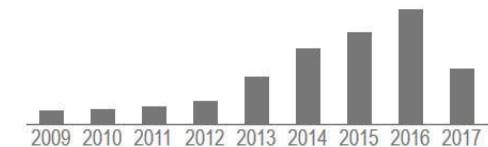
Verified email at tums.ac.ir - Homepage



Title	1–20	Cited by	Year
A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010	SS Lim, T Vos, AD Flaxman, G Danaei, K Shibuya, H Adair-Rohani, ... The lancet 380 (9859), 2224-2260	5834	2013
Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010	CJL Murray, T Vos, R Lozano, M Naghavi, AD Flaxman, C Michaud, ... The lancet 380 (9859), 2197-2223	4397	2013
Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010	T Vos, AD Flaxman, M Naghavi, R Lozano, C Michaud, M Ezzati, ... The Lancet 380 (9859), 2163-2196	3277	2013
Common values in assessing health outcomes from disease and injury: disability weights measurement study for the Global Burden of Disease Study 2010	JA Salomon, T Vos, DR Hogan, M Gagnon, M Naghavi, A Mokdad, ... The Lancet 380 (9859), 2129-2143	693	2013

Google Scholar

Citation indices	All	Since 2012
Citations	32754	26983
h-index	72	58
i10-index	307	274



Co-authors View all...

Akram Pourshams

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Farin Kamangar

Paolo Boffetta

Christian Abnet

Mehdi Mohamadnejad

Seyed Mehdi Nouraie

Scopus Author Identifier

- The Scopus Author Identifier assigns a unique number to groups of documents written by the same author via an algorithm that matches authorship based on a certain criteria.
- Many authors have similar names.
- Author names can be formatted differently.

ISID Author Profile

<isid.research.ac.ir>

راهنما



کتاب نویسندگان خود: تعدادات

استناد بازی

هر مقاله	H-Index	تعدادات
۴۵/۰۹	۶۰	۲۲۱۳
۲۰/۸۱	۵۹	۱۴۴۴
۱۵/۳۷	۵۶	۱۴۰۴
۲۰/۷۶	۵۲	۷۰۵۷
۱۲/۱۱	۴۴	۹۳۰۲

درخواست اصلاحات

مشخصات عضو

نام و نام خانوادگی: رضا ملک زاده

دانشگاه/موسسه: دانشگاه علوم پزشکی تهران

دانشکده: پزشکی

مرکز تحقیقاتی: مرکز تحقیقات سرطان های گوارش و کبد

پروفايل‌ها: CV ResearcherID Google Scholar ORCID Scopus

آخرين بهنگام سازی: امروز

تاریخچه استنادات: WoS ISI Google Scholar Scopus



سال	مقالات	استنادات
۲۰۰۷	۵	۱۰
۲۰۰۸	۱۰	۲۰
۲۰۰۹	۱۰	۲۰
۲۰۱۰	۱۵	۳۰
۲۰۱۱	۱۵	۳۰
۲۰۱۲	۲۰	۴۰
۲۰۱۳	۲۵	۵۰
۲۰۱۴	۳۰	۶۰
۲۰۱۵	۳۵	۷۰
۲۰۱۶	۴۰	۸۰
۲۰۱۷	۴۵	۹۰
۲۰۱۸	۵۴	۵۴۷۸

ورود به سامانه

سازمان علمی اعضای هیأت

وزارت بهداشت درمان و آموزش
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مرکز توسعه و هماهنگی اطلاعات و ات
گروه علم سنجی و انتشارات

تعداد نتایج: ۱۸۹۰۰

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