Measuring Researcher Impact
Enable researchers at Murdoch University to measure the quantity and quality of their research output using:

- Publication and citation counts
- Metrics
- Altmetrics
- Measures of esteem
Overview

1. Why measure researcher impact?
2. Using researcher profiles and identifiers
3. Finding publication and citation counts
4. Creating citation reports
5. Calculating individual researcher metrics
6. Using altmetrics
7. Determining measures of esteem
8. Finding help
Tools: Guide

Measure Research Quality and Impact: Home

Home Citation Metrics Alternative Metrics Researcher Impact Journal Quality & Impact Book Quality & Impact University Impact

Research Support

Researchers at Murdoch University are supported by the Library and the Research and Innovation Directorate.

Please contact your Subject Librarian to make an appointment for advice on measuring research quality and impact.

Measuring Research Quality and Impact

The activity of measuring and describing the quality and impact of academic research is increasingly important in Australia and around the world. Applications for grant funding or career advancement may require an indication of both the quantity of your research output and of the quality of your research.

Research Impact measurement may be calculated using researcher specific metrics such as the h-Index, or by quantitative methods such as citation counts or journal impact factors. This type of measurement is also referred to as bibliometrics.

This guide provides information on a range of bibliometrics including citation metrics, alternative metrics, researcher impact, journal quality and impact, book quality and impact, and university rankings.

Key Terms and Definitions

Altmetrics - Altmetrics (alternative metrics) are qualitative data that are complementary to traditional, citation-based metrics (bibliometrics), including citations in public policy documents, discussions on research blogs, mainstream media coverage, bookmarks on reference managers, and mentions on social media.

Author Identifiers - Author Identifiers are unique identifiers that distinguish individual authors from other researchers and unambiguously associate an author with their work.

Bibliometrics - Bibliometrics is the quantitative analysis of traditional academic literature, such as books, book chapters, conference papers or journal articles, to determine quality and impact.

Cited reference search - A cited reference search allows you to use appropriate library resources and citation indexes to search for works that cite a particular publication.

Citation Index - A citation Index is an index of citations between publications, allowing the user to easily establish which later documents cite which earlier documents.

Citation report - A citation report is a compilation of the bibliographic details for all of the publications a researcher has authored, along with the number of times these publications have been cited and any relevant author metrics.

Citation - A reference or quotation from a publication or author, especially in a scholarly work.

libguides.murdoch.edu.au/measure_research
Tools: Databases

- Scopus
- Web of Science Core Collection
- SciVal

http://goto.murdoch.edu.au/Databases
Tools: Scopus

- Multidisciplinary
- Includes journals, books and conference proceedings
- Includes citation data and analyses author output
Tools: Web of Science Core Collection

- Multidisciplinary
- Includes journals and conference proceedings
- Includes citation data and analyses author output
Tools: SciVal

- Research benchmarking and metrics database
- Based on Scopus data
- Analyses author, group, department, university & country output
Why measure researcher impact?

You may be asked to demonstrate the quantity, quality and impact of your research publications for a variety of purposes:

- to enhance your profiles and promote your research to potential employers, collaborators and investors
- to benchmark your productivity for performance reviews
- to support promotion or tenure applications
- to support grant or other funding applications and progress reports
Using researcher profiles and identifiers

Research profiles are the basis for measuring your research output and allow you to:

• Manage your publications list
• Avoid misidentification
• Track citation counts
• Attribute your research output to Murdoch University
• Promote your research locally, nationally and globally
• Be identified by potential collaborators
• Enhance your Murdoch staff profile with current data
Which profile service should I use?

- Multiple profile services are available with different advantages

- May need more than one for comprehensive coverage of your research:
  - ORCiD
  - Author Identifier - Scopus (Elsevier)
  - ResearcherID - Web of Science (Clarivate Analytics)
Profile service: ORCiD

Open Researcher and Contributor ID

A persistent digital identifier which distinguishes you from all other researchers and provides two basic services:

1. a registry to obtain a unique identifier and manage a record of activities

2. a platform that supports system-to-system communication and collates citation data

https://orcid.org/
Profile service: ORCID

Advantages:

• Having an ORCID profile streamlines manuscript submission and grant applications

• Allows you to attach your identity to research objects such as articles, citations, datasets, patents, experiments and equipment

• Some journals now require you to provide an ORCID when submitting articles for publication
Profile service: Author ID

Scopus

- Assigns a unique number to each author in the Scopus database and groups together all their publications
- Accounts for variant versions of names by matching affiliations, addresses, subject areas, co-authors and dates of publication
- Automatically calculates citation counts and h-index
Profile service: Researcher ID

Web of Science

- Assigns a specific ID number to each registered researcher in order to reduce identity ambiguity

- Researchers can add the details of their publications to their individual profile and these are made available to anyone searching the database

- Citation metrics such as number of times cited and h-index are automatically calculated using data from Web of Science
Publication and citation counts

- The research output of an individual researcher can be measured using both publication and citation counts.
- A researcher's publication count can be determined using bibliographic databases.
- Citation counts can be determined using citation databases.
- Can be biased by self-citation, one very highly cited paper or a large number of papers with no citations.
Creating citation reports

The report function in citation databases will allow you to:

• Sort results by publication date, times cited, etc.
• Follow links to view citing articles
• Identify trends over time
• Exclude self-citations by the author from the report
Creating citation reports

A citation report or overview from these databases includes the following data, for the publications and time period indexed by the database:

- the number of documents cited
- the total number of citations received
- the total number of citing documents
- the total number of citations received per year for a specified time period
- the number of citations for each publication per year for a specified time period
- the author or publication's h-index and associated h-graph
Creating citation reports

• Depending on which database you use, this information is presented as a series of graphs and tables that can be copied into other documents.

• As citation data is not static, when publication or citation counts are included in documents, you should state which tool you used and the date the data was obtained.

• The citation report feature of both Scopus and Web of Science has limited export options, use ORCiD to collate results.
Using citation databases

Examples:

Scopus

and

Web of Science Core Collection
### Scopus: Author Search

**Author search**

<table>
<thead>
<tr>
<th>Documents</th>
<th>Authors</th>
<th>Affiliations</th>
<th>Advanced</th>
</tr>
</thead>
</table>
| **Author last name**<br> Ryan  
  e.g. Smith  
  Affiliation  
  Murdoch University  
  e.g. University of Toronto | Author first name  
  U | Show exact matches only | Search Q |

**ORCID**

| e.g. 0001-2222-3333-4444x | Search Q |
Author last name "Ryan", Author first name "U", Affiliation "Murdoch University"

<table>
<thead>
<tr>
<th>Author</th>
<th>Documents</th>
<th>Subject area</th>
<th>Affiliation</th>
<th>City</th>
<th>Country/Territory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryan, Una M.</td>
<td>287</td>
<td>Immunology and Microbiology; Medicine; Agricultural and Biological Sciences;...</td>
<td>Murdoch University</td>
<td>Perth</td>
<td>Australia</td>
</tr>
</tbody>
</table>
Scopus: Author

Ryan, Una M.
Murdoch University, School of Veterinary and Life Sciences, Perth, Australia
Author ID: 7004228883

Subject areas:
- Immunology and Microbiology
- Medicine
- Agricultural and Biological Sciences
- Veterinary Science
- Biochemistry, Genetics and Molecular Biology
- Environmental Science
- Chemical Engineering
- Multidisciplinary

Documents by author:
- 287 Documents
- Cited by 4562 documents
- 150 co-authors
- Total citations: 11132 by 4562 documents

Get citation alerts, Request author detail corrections, Add to ORCID, Export profile to SciVal

Venue: International Journal for Parasitology
Year: 2019
Views: 40
Citations: 0

Document title: Giardia: an under-reported foodborne parasite
Authors: Ryan, U., Hijawi, N., Feng, Y., Xiao, L.
Year: 2019
Source: International Journal for Parasitology
Volume: 49(1), pp. 1-11
Published in: October 2019
Cited by: 0

Venue: Science of the Total Environment
Year: 2018
Views: 48
Citations: 1

Document title: Profiling the diversity of Cryptosporidium species and genotypes in wastewater treatment plants in Australia using next generation sequencing
Authors: Zahedi, A., Gofron, A.W., Greag, T., (..), Robertson, I., Ryan, U.
Year: 2018
Source: Science of the Total Environment
Volume: 644, pp. 635-648
Published in: August 2018
Cited by: 1

Venue: Scientific Reports
Year: 2018
Views: 44
Citations: 0

Document title: Salmonella enterica isolates from Western Australian rangeland goats remain susceptible to critically important antimonials
Authors: Al-Halbi, K., Jordan, D., Harb, A., (..), Ryan, U., Abraham, S.
Year: 2018
Source: Scientific Reports
Volume: 8(1), 15326
Published in: November 2018
Cited by: 0

Venue: Infection, Genetics and Evolution
Year: 2018
Views: 23
Citations: 1

Document title: Genome-wide analysis of Borrelia turicata and ‘Candidatus Borrelia tachygyloss’ shows relapsing fever-like genomes with unique genomic links to Lyme disease Borrelia
Authors: Gofron, A.W., Margos, G., Fingas, V., (..), Irwin, P., Oskam, C.L.
Year: 2018
Source: Infection, Genetics and Evolution
Volume: 66, pp. 72-81
Published in: May 2018
Cited by: 1

Venue: Trends in Parasitology
Year: 2018
Views: 14
Citations: 3

Document title: Genetic Diversity and Population Structure of Cryptosporidium
Authors: Feng, Y., Ryan, U.M., Xiao, L.
Year: 2018
Source: Trends in Parasitology
Volume: 34(11), pp. 997-1011
Published in: November 2018
Cited by: 3
Scopus: Author

1 author results

Author last name "Ryan", Author first name "U", Affiliation "Murdoch University"

Edit

- Show exact matches only

Refine results

Limit to | Exclude

Source title

- Acta Parasitologica
- American Journal Of Tropical Medicine And Hygiene

Sort on: Document count (high-low)

<table>
<thead>
<tr>
<th>Author</th>
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<td>Morgan, U. M.</td>
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<td>Morgan-Ryan, Una</td>
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<td>Morgan-Ryan, Una M.</td>
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</table>
### Scopus: Author

#### Analyze search results

<table>
<thead>
<tr>
<th>Document title</th>
<th>Authors</th>
<th>Year</th>
<th>Source</th>
<th>Cited by</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>49(1), pp. 1-11</td>
<td></td>
</tr>
<tr>
<td>2. Profiling the diversity of Cryptosporidium species and genotypes in wastewater treatment plants in Australia using next generation sequencing</td>
<td>Zahedi, A., Cotton, A.W., Greay, T., (...), Robertson, I., Ryan, U.</td>
<td>2018</td>
<td>Science of the Total Environment</td>
<td>1</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>644, pp. 635-648</td>
<td></td>
</tr>
</tbody>
</table>
Scopus: Author
WoS CC: Author
WoS CC: Author

- Select relevant Research Domain OR All Research Domains
- Select Organization = Murdoch University
- Select Finish Search
<table>
<thead>
<tr>
<th>1.</th>
<th>Profiling the diversity of Cryptosporidium species and genotypes in wastewater treatment plants in Australia using next generation sequencing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>By:</strong> Zahedi, Alireza; Golton, Alexander W.; Greay, Telleasha; et al.</td>
<td></td>
</tr>
<tr>
<td><strong>SCIENCE OF THE TOTAL ENVIRONMENT</strong></td>
<td>Volume: 644</td>
</tr>
<tr>
<td><a href="#">Find on Murdoch</a></td>
<td><a href="#">View Abstract</a></td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>2.</th>
<th>Genome-wide analysis of Borrelia turcica and 'Candidatus Borrelia tachyglossi' shows relapsing fever-like genomes with unique genomic links to Lyme disease Borrelia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>By:</strong> Golton, Alexander W.; Margos, Gabriele; Fingerle, Volker; et al.</td>
<td></td>
</tr>
<tr>
<td><strong>INFECTION GENETICS AND EVOLUTION</strong></td>
<td>Volume: 66</td>
</tr>
<tr>
<td><a href="#">Find on Murdoch</a></td>
<td><a href="#">View Abstract</a></td>
</tr>
</tbody>
</table>
### WoS CC: Author

**Citation report for 220 results from Web of Science Core Collection** between 2000 and 2019.

- **Total Publications**: 220
- **A-index**: 36
- **Sum of Times Cited**: 5,521
- **Citing Articles**: 2,696
- **Without self citations**:
  - **Average citations per Item**: 25.1
  - **Total Citations**: 4,559
  - **Without self citations**: 2,501

**Sum of Times Cited per Year**

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Citations</th>
<th>Average Citations per Year</th>
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<tbody>
<tr>
<td>2015</td>
<td>562</td>
<td>224.7%</td>
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<tr>
<td>2016</td>
<td>446</td>
<td></td>
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<tr>
<td>2017</td>
<td>662</td>
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<td>2018</td>
<td>836</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>29</td>
<td></td>
</tr>
</tbody>
</table>

**Items**

1. *Cryptosporidium tayronae: Recent advances and implications for public health*
   - By: Xiao, Lin; Fayer, R.; Ryan, U.; et al.
   - *CLINICAL MICROBIOLOGY REVIEWS* Volume: 17 Issue: 1 Pages: 7-24; Published: JAN 2004

2. *Molecular epidemiology of giardiasis*
   - By: Carrino, Simone M.; Ryan, U.;
   - *MOLECULAR AND BIOCHEMICAL PARASITOLOGY* Volume: 205 Issue: 2 Pages: 75-80; Published: AUG 2008
Publication and citation counts

Activity:

Use Scopus and Web of Science to determine the publication and citation counts of yourself, your supervisor, or a researcher in your field

Are the results the same?
Calculating individual researcher metrics

- These metrics are only indicative and do not provide a complete view of a researcher’s productivity.

- Some metrics attempt to allow for differences, but they should not be used to compare researchers from different fields or researchers at different stages of their careers.

- Very limited value in some disciplines.
Individual researcher metrics

Common:

- h-index (Hirsch Index)
- FWCI (Field Weighted Citation Impact)
h-index

**Calculation:** $h$-index = # of articles ($n$) in the database that have received the same number or more ($n$) citations over time

- $h$-index is not skewed by a single highly cited paper nor by a large number of poorly cited papers
- $h$-index is not a static value – need to specify date of $h$-index
- More than one tool can be used to calculate your $h$-index and the value may vary – need to specify source of $h$-index
Scopus: h-index

Ryan, Una M.
Murdoch University, School of Veterinary and Life Sciences, Perth, Australia
Author ID: 7004282987

Subject area:
- Immunology and Microbiology
- Medicine
- Agricultural and Biological Sciences
- Veterinary
- Biochemistry, Genetics and Molecular Biology
- Environmental Science
- Engineering

Document and citation trends:
- Year: 2009 to 2019
- Cited: 56
- Citations: 1070

287 Documents Cited by 4562 documents 150 co-authors

Export profile to SciVal

Search results format
- View all
- Add all to list
- Set document alert
- Set document feed

Document title
- Giardias: an under-reported foodborne parasite
- Profiling the diversity of Cryptosporidium species and genotypes in wastewater treatment plants in Australia using next generation sequencing
- Salmonella enterica isolates from Western Australian rangeland goats remain susceptible to critically important antimicrobials
- Genome-wide analysis of Borrelia turicatae and ‘Candidatus Borrelia tachyphilus’ shows relapsing fever-like genomes with unique genomic links to Lyme disease Borrelia
- Genetic Diversity and Population Structure of Cryptosporidium

Authors
- Ryan, U., Hijawi, N., Feng, Y., Xiao, L.
- Zahedi, A., Goffon, A.W., Greay, T., ... Ryan, U.
- Al-Halbi, K., Jordan, D., Harb, A., ... Ryan, U., Abraham, S.
- Goffon, A.W., Margos, G., Ringslo, V., ... Irwin, P., Osland, C.L.
- Feng, Y., Ryan, U.M., Xiao, L.

Year
- 2019
- 2018
- 2018
- 2018
- 2018

Source
- International Journal for Parasitology
- Science of the Total Environment
- Scientific Reports
- Infection, Genetics and Evolution
- Trends in Parasitology

Cited by
- 0
- 1
- 1
- 3

Follow this Author
View potential author matches
Is this you?

Get citation alerts
Add to ORCID
Request author detail corrections
Export profile to SciVal
Scopus: h-index

This author's h-index

The h-index is based upon the number of documents and number of citations.
WoS CC: Author

Activity 4
Individual researcher metrics

Activity:

Use Scopus and Web of Science to determine the h-index of yourself, your supervisor, or a researcher in your field.

Are the results the same?
FWCI

**Calculation:** the total citations received by a researcher's publications is compared to the average number of citations received by all other similar publications from the same research field for a defined three year period.

- The global mean of the FWCI is 1.0, so an FWCI of 1.50 means 50% more cited than the world average; whereas, an FWCI of .75 means 25% less cited than the world average.

- FWCI is calculated using SciVal and based on Scopus data.

- FWCI is not a static value – need to specify date.
Welcome to SciVal

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

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

Collaboration
Explore the collaboration network of both your Institution and other Institutions.
Go to Collaboration

Trends
Get the current scientific trends to determine a new research strategy, find collaboration opportunities and rising stars.
Go to Trends

Reporting
Create rich Reports specifically tailored to support your institution's distinct research strategy.
Go to Reporting
Ryan, Una M.

**Overall research performance**

- **Scholarly Output**: 75
- **Field-Weighted Citation Impact**: 1.91
- **Citation Count**: 640
- **Citations per Publication**: 8.5
- **H-index**: 54
- **h5-index**: 15

**Topics**

- 07 Agricultural and Veterinary Sciences (40.6%)
- 06 Biological Sciences (38.4%)
- 11 Medical and Health Sciences (14.5%)
- 09 Engineering (2.2%)
- 23 Multidisciplinary (4.3%)
Altmetrics

- Complement traditional impact measurement methods
- Good alternative for the humanities and social sciences
- Good alternative for books, conference papers, creative media, etc.
Altmetrics are alternative metrics used to measure the impact of research based on a variety of online activities, including:

- tweets, mentions, shares or links
- downloads, clicks or views
- saves, bookmarks, favourites, likes or up-votes
- reviews, comments, ratings, or recommendations
- readers, subscribers, watchers, or followers
Altmetrics

There are two tools that aggregate alternative metrics from a wide variety of different websites and online tools:

1. Altmetric.com
2. Plum Analytics
Altmetrics: Altmetric.com

- Measures the attention an output receives from 17 different sources of attention
- Results display visually in the Altmetric donut:
- Donut colours represent different sources and varying degrees of attention from each source
Altmetrics: Altmetric.com

- Altmetric.com offers a free Altmetric it! bookmarklet for Chrome, Firefox and Safari, which allows researchers to view altmetric information for any online resource with a DOI.

![Article metrics for: Public health: The toxic truth about sugar](image)
Altmetrics: Altmetric.com

- Some databases and electronic journals, now have Altmetric widgets embedded in the pages for articles:
Altmetrics: Plum Analytics

- Plum Analytics collects impact altmetrics (PlumX) in captures, usage, citations, mentions, and social media.

- PlumX metrics are available for over 20 different types of research outputs including: journal articles, books, videos, presentations, datasets, source code, and others.
Altmetrics: Plum Analytics

- This information is then displayed visually in the PlumX PlumPrint:

- The colours of the PlumX PlumPrint each represent a different source of attention

- Plum Analytics collects metrics for individual research artifacts, but also can also provide data for laboratories, departments and other research groups
Altmetrics: Plum Analytics

- Some databases and electronic journals, now have Plum Analytics widgets embedded in the pages for articles. A PlumX link will allow you to view the full article-level altmetrics:
Determining measures of esteem

Provide evidence of research quality and may include:

- awards and prizes
- rankings in prestigious lists
- research fellowships
- patents or other commercial output
- successfully completed research grants or projects
- editorial or reviewer role for a significant journal or reference work
- keynote and plenary addresses at conferences, conference organisation or presentations at significant international conferences
Finding help: Ask Our Librarians

Ask our Librarians

Need help finding resources for your assignments or building your research strategies?

Our Subject Librarians are skilled information professionals who can provide study, teaching and research support. We can provide support on:

- finding scholarly information to support research via our Subject Guides
- library skills training
- managing and organising research sources using EndNote
- referencing sources in assignments
- scholarly publishing, publication impact, open access and copyright.

Ask us a question

For quick questions via email, use the enquiry form below. For Murdoch students and staff only.

ASK A QUESTION

Subject support and consultations

Connect with our Librarians, access their Subject Guides or book a consultation for more complex study or research enquiries.

Arts
Business and Governance
Education
Engineering and Information Technology
Health Professions
Law
Psychology and Exercise Science
Sir Walter Murdoch School of Public Policy and International Affairs
Veterinary and Life Sciences

When are we open?
Check the opening hours of the Geoffrey Bolton, Mandurah and Veterinary libraries.

Join the Murdoch Library to make the most of what we can offer you.

SIGN UP NOW
Finding help: Consultations

• Provide further research support and skills training for academic staff and research students

• You can arrange an individual or small group consultation
Any questions?

Please help us by completing the feedback survey.