



# How to review literature?



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# Focus of the talk



What is research?



How to decide a  
topic/subject for  
research?



How to review the  
literature?



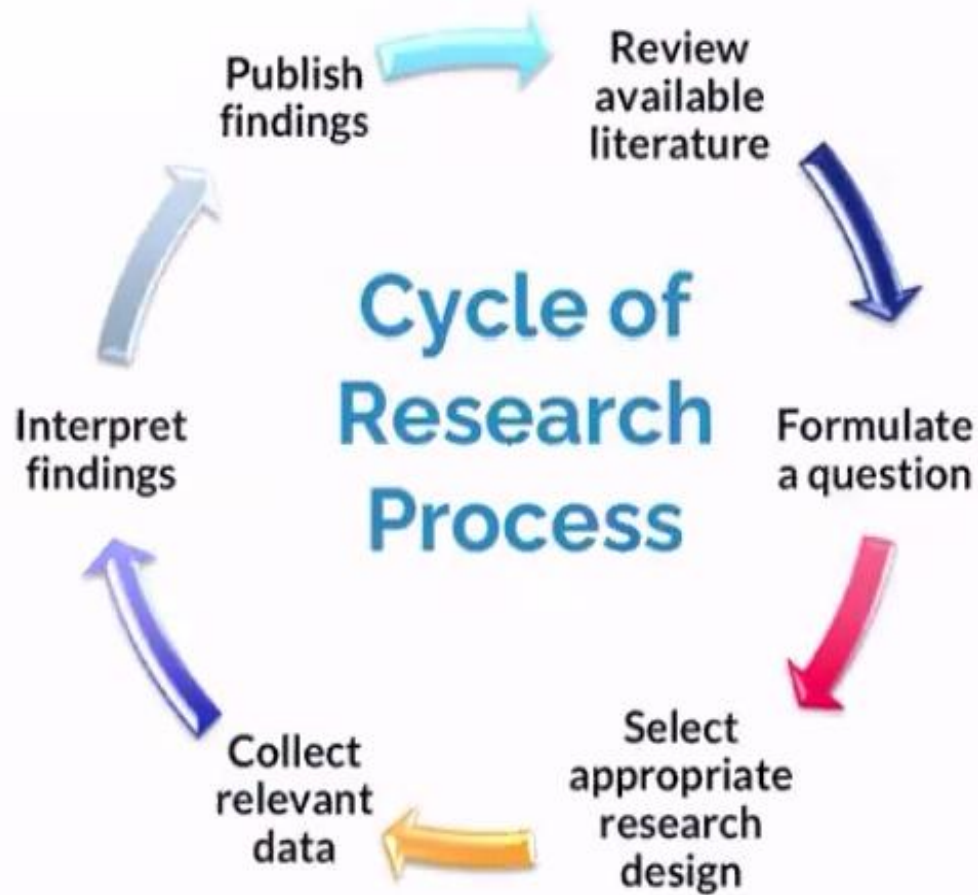
What is the purpose of  
reviewing the literature?



What are the available  
resources?



How to organize the  
contents?



/ P of P

# What is Research ?



- It is the systematic and rigorous scientific investigation of a situation or problem in order to generate new knowledge or validate existing knowledge, to contribute to its advancement.
- It is an endeavour to discover new or collate old facts by the scientific study of a subject or by a course of critical investigation.
- According to Redman and Mory, Research is a "Systematized effort to gain new knowledge".
- In essence, Research is the search for knowledge, using objectives and systematic methods to find solution to a problem.

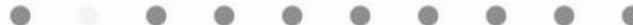


# Types of Research

- On a broader perspective, all researches can be categorized into two groups:

➡ Qualitative Research ✓

➡ Quantitative Research ✓



## → Qualitative Research →

## → Quantitative Research

- It refers to the non-numerical observations to address 'WHY' questions.
- Qualitative research deals with phenomena that are difficult or impossible to quantify mathematically, such as beliefs, meanings, attributes, symbols, etc.
- Qualitative research techniques include focus groups, interviews, and observations-
  - to unravel pattern, trends;
  - insight for hypothesis;
  - understand reason and motivation.

 Qualitative Research

 Quantitative Research 

- It uses data that can be converted into numerical form to answer 'HOW' questions.
- Quantitative research refers to the systematic empirical investigation of any phenomena via statistical , mathematical or computational techniques.



# Research Problem /Topic/Subject

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- The research problem undertaken for study must be carefully selected.  
|| Help may be taken from a research supervisor/mentor in this connection.
- Ask yourself one key question: Where do you YOUR interests lie?



# What?, Why?, Where?, How?



# Research Problem/Task

1.

Something you want to know about your discipline, or about a specific area within your discipline.

Note a topic, fragment, phrase, or sentence. It ends with a question mark (?).

2.

Research subject can come from insights stemming from:

- Personal experience
- Theory
- Observations
- Contemporary issues
- Engagement with the literature

3.

It should be:

- Clear
- Focused
- Concise
- Complex
- Arguable

# What should be done to- Define a Research Target/Subject?

.1.

Normally, overdone subject should not be picked, because in such a situation, it would be a difficult task to shed some new light.

.3.

The subject selected for research should be familiar and feasible so that the related research material or sources of research are within one's reach.

.2.

There must be some objective(s) to be attained

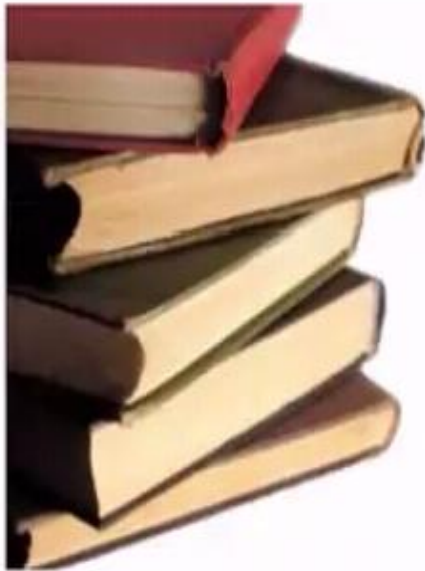
.4.

The importance of the subject, the qualifications and the training of a researcher, the costs involved, the time factor are few other criteria that must also be considered in selecting a problem.

Before the final selection of a problem, a researcher must ask him/her self the following questions:

- Whether he/she is well equipped in terms of his/her background to carry out the research?
- Whether the study falls within the budget he/she can afford?
- Whether the necessary cooperation can be obtained from those who must participate in research as subjects?

# Literature Review



- Once the problem is formulated, the researcher should undertake extensive literature review connected with the problem.
- Literature review is done because it assists in-
  - ✓ refining statement of the problem
  - ✓ strengthening the argument of selection of a research topic (Justification)
  - ✓ getting familiar with various types of methodology that might be used in the study (Design)





# Literature Review.....

- A literature review is a systematic and comprehensive account of selected literature already published on a particular research topic.
- It gives an overview to the researcher to discover what is already known about the current research problem and what more can be designed and developed.
- Review of literature is an important step to follow the research process.
- The already established data can be useful for a researcher in comparing the results and findings for their current study.

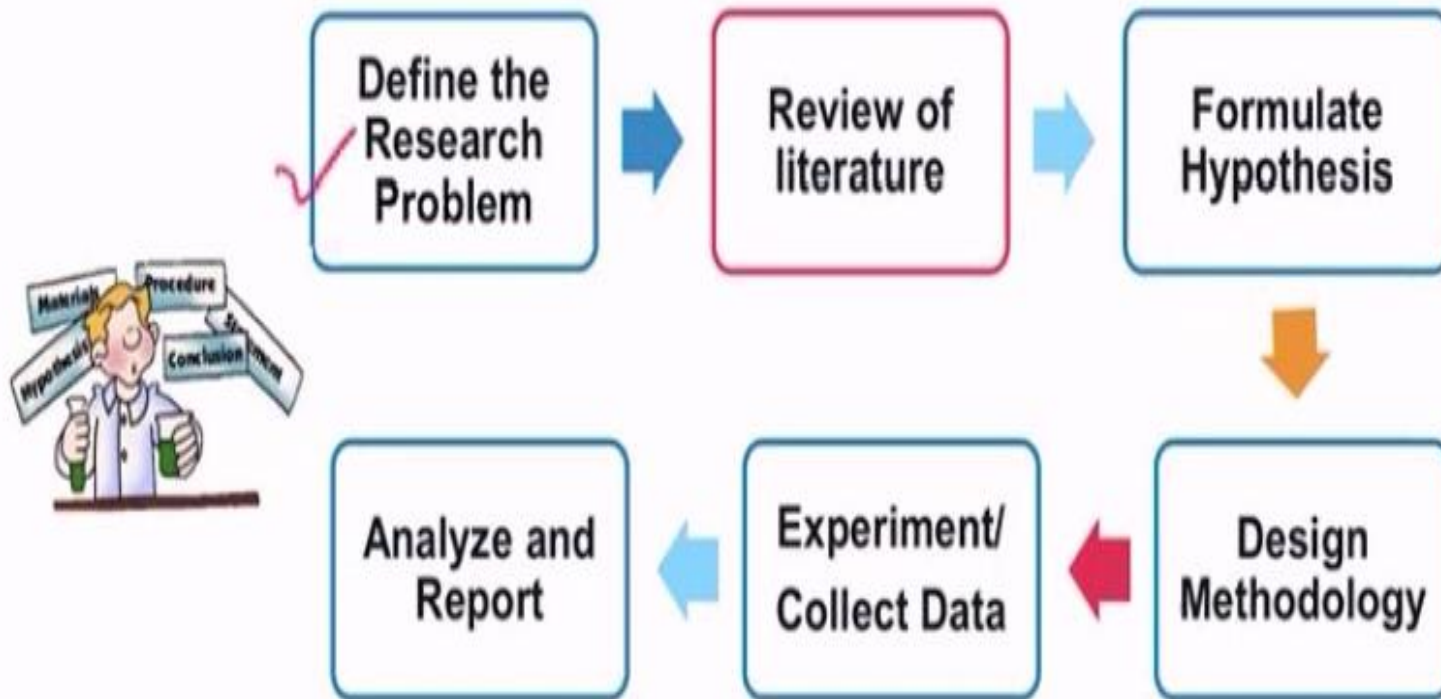
Thus,

The review of the literature is defined as a broad, comprehensive, in-depth, systematic, and critical review of scholarly publications, unpublished scholarly print materials, audio-visual materials, and personal communications.

## Structure a Literature Review in easy way



# Literature Review is a foundation step in research process





# Purpose of Literature Review

1. Determines whether proposed research is actually needed or not.
2. It is an account of what is already known about a particular phenomenon.
3. Gives background knowledge of the field under investigation.
4. Helps identify current research gaps and understand where you need to focus your efforts. ||
5. Provides a knowledge of facts, eminent researchers, and possible research methods in your area.
6. Reviewing literature is a tedious activity, but it is necessary if the process is to be successful.



Literature Review

# Guidelines for Writing a Literature Review

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Conduct a thorough literature survey before you start

Ensure to present the research problem clearly

Compare & Contrast the different views in the sources

Include title, abstract, index, introduction, corpus, bibliography & appendices

Mention the paper's methodology, analysis, & equipments

Remember to cite properly

Limit the biases

Summarize the strengths & weaknesses of the study

# Scientific Literature Review

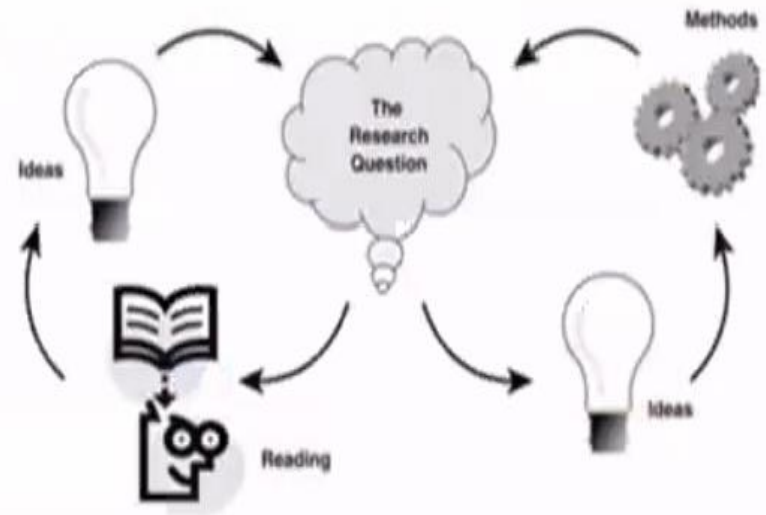
A scientific literature review is a critical account of what has been published on a topic by accredited researchers.

It may be:

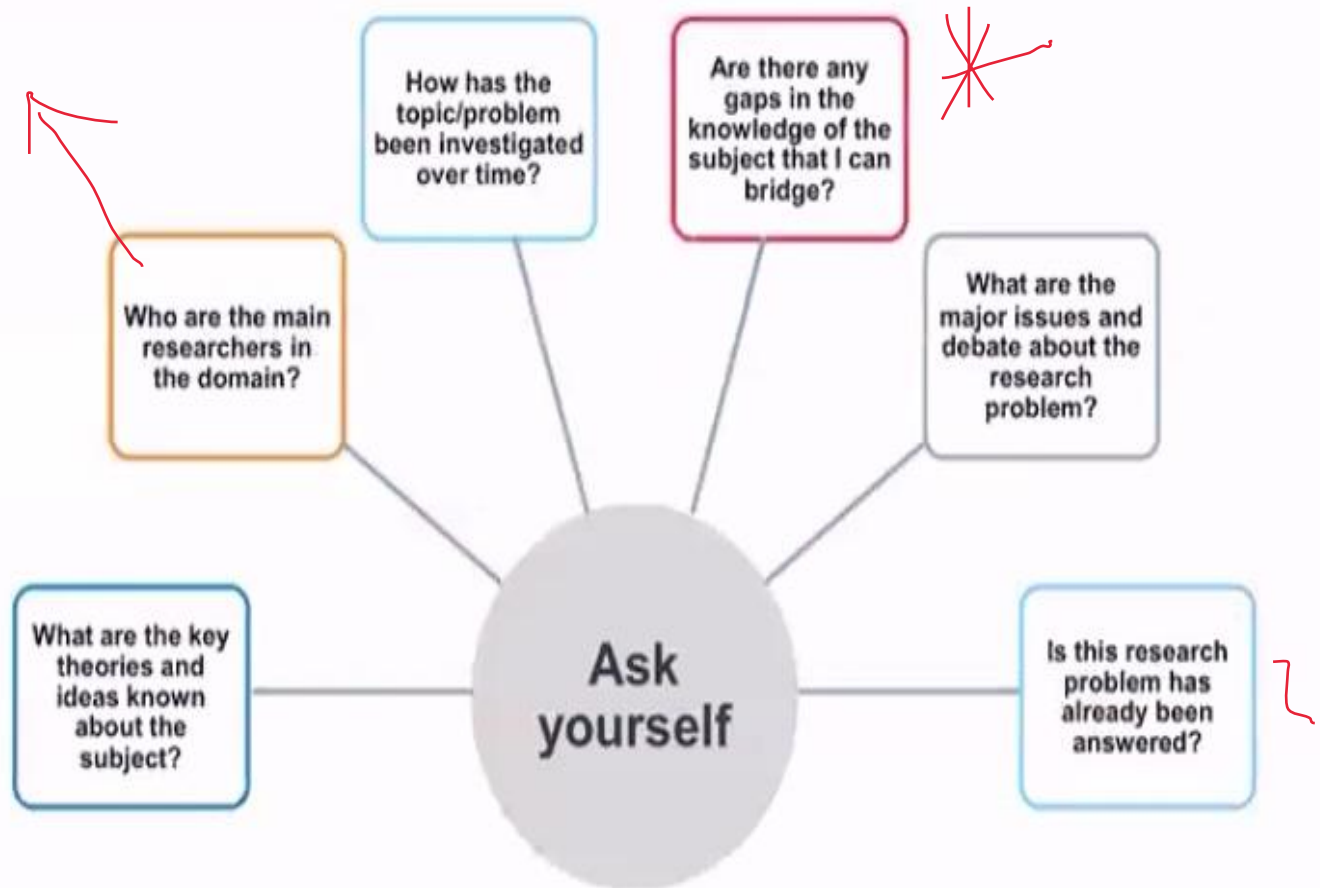
- A stand-alone assignment
- An introduction to an essay, report, thesis chapter, etc.
- Rationale for engaging in primary research
- Part of research/grant proposals

Writing a scientific literature review will:

- Improve your topic knowledge
- Provide insights on your topic to others
- Demonstrate your data search abilities
- Demonstrate your critical analysis skills
- Demonstrate your communication/writing skills



# Start with the following questions





# Also think about..

- A literature review is a process as well as an outcome!

- **Literature review as an outcome:** appears in the final draft of your thesis/article as part of your introduction or as a separate chapter.

- **Literature review as a process:** is a critical engagement (thinking, reading and writing) with relevant research on your topic. It is a crucial and formative stage of your thesis/article journey.

**While reading published material**, think about:

- What were the research aims of the paper/book?
- Is the research aim achieved? If so, how did they do it?
- Are there any problems with their methodology?
- Was it a strong or a weak research model?
- How is this study going to help with your own research?
- What can you take from it?
- What needs to be avoided?
- What are you doing differently?

# Contents of Literature Review

.1.

.2.

.3.

.4.

## Introduction

It establishes the writer's point of view and appropriate context for reviewing the literature on a particular topic.

## Body

It includes group research studies, theoretical articles, case studies, conclusions of authors, specific objectives, chronology etc. It also summarizes individual studies or articles and their comparative importance in the literature.

## Conclusion

It summarizes major contributions of significant studies and relates the body under review and the focus of the introduction. It also provide some insight into the current topic of the research.

## References

Bibliography or the list of references to be given in appropriate format.

# Other Prerequisites of literature review

- ✓ Locate different types of resources
- Decide which resources might be suitable
- Select most appropriate resources
- ✓ Revise research questions, if necessary



- **Finding too much?** If you find so many citations that there is no end to the number of references you could use, it's time to re-evaluate your question. It's too broad/Nothing much to explore.
- **Finding too little?** On the other hand, if you can't find much of anything, ask yourself if you're looking in the right area/direction.
- **Take thorough notes.** Be sure to write copious notes on everything as you proceed through your research.
- **Look for references to papers** from which you can identify the most useful journals.
- **Identify those authors** who seem to be important in your subject area.



# Sources of literature



## Books

- Text books
- Monographs
- Edited collections



## Past Dissertations/ thesis



## Journal Articles

- Academic journals
- Conference Proceedings



## Vital statistics

- Census
- Government Records (NIC)
- Surveillance system
- Surveys



## Indexing and Abstracting journal search engines

- Pubmed
- Google Scholar



## International organization documents

- e.g. (WHO, UNICEF)



## Media

- Newspaper
- Magazine



## Internet



# Institutional Library

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- Institutional library serves as a greatest source of literature review
- Our University (DAVV) library subscribes International/Foreign and Indian Journals in various specialties
- The library has a exclusive collection of numerous Thesis and Dissertations of PhD students.

# Websites for Scientific/ Research material



- Science Direct (Elsevier)
- American Chemical Society (ACS)
- Royal Society of Chemistry (RSC)
- Sci-Hub (removing barriers in the way of science)
- Springer
- Elsevier
- Wiley
- Taylor & Francis ..... and many more

APS  
AIP

# Useful websites

- **PubMed Central** - is the National Library of Medicine's database of free, full-text medical articles made available by contributing publishers.
- **ScienceDirect** - is a part of Elsevier, a publisher of scientific, technical and medical information provider. It is an online collection of published scientific research, including over 2500 journals and 6000 books
- **Sci-Hub** - Can search a research paper of choice through DOI number / other details
- **Medline** - Major bibliographic database for biomedical sciences
- **Embase** - An extensive biomedical and pharmaceutical database from Elsevier.
- **Proquest** - Database for biomedical sciences
- **Medscape** - Provides the latest medical news, clinical trial coverage, drug updates, journal articles, CME activities & more.





journals & Books

Title

References

Search for peer-reviewed journals, articles, book chapters and open access content.

Advanced Search

Keywords

Author name

Journal/book title

Volume

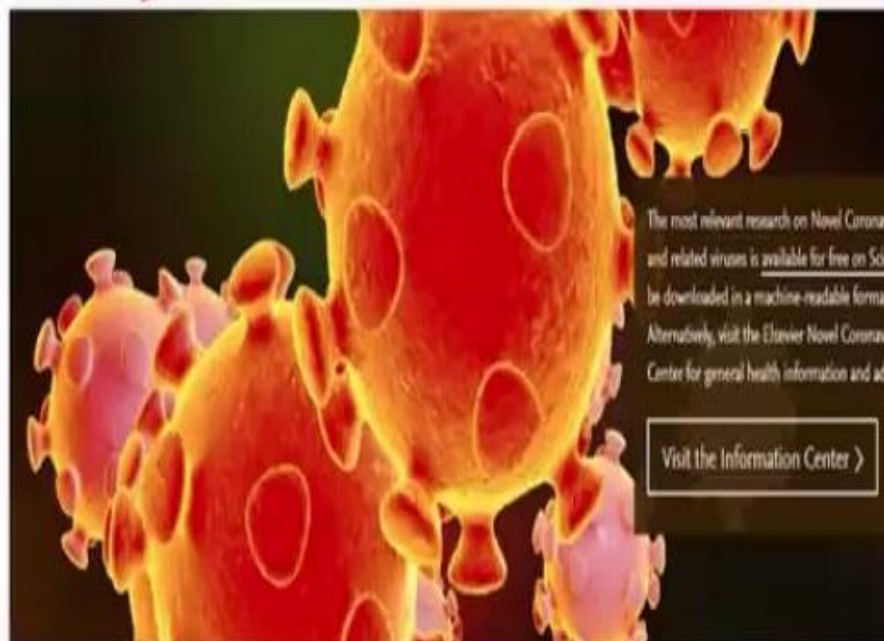
Issue

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Advanced search

ISSN or ISBN



Article types

☐ Review articles

☐ Correspondence

☐ Patent reports

☐ Research articles

☐ Data articles

☐ Practice guidelines

☐ Encyclopedia

☐ Discussion

☐ Product reviews

☐ Book chapters

☐ Editorials

☐ Replication studies

☐ Conference abstracts

☐ Errata

☐ Short communications

☐ Book reviews

☐ Examinations

☐ Software publications

☐ Case reports

☐ Mini reviews

☐ Video articles

☐ Conference info

☐ News

☐ Other

90,472 Search Results - Keyword: heterocyclic chemistry

Refine by:

Years

- ☐ 2021 (568)
- ☐ 2020 (3,384)
- ☐ 2019 (4,274)

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Article type ⓘ

- ☐ Review articles (5,813)
- ☐ Research articles (56,857)
- ☐ Encyclopedia (2,387)
- ☐ Book chapters (6,277)

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Publication title

- ☐ Tetrahedron Letters (8,639)
- ☐ Tetrahedron (8,164)
- ☐ Bioorganic & Medicinal Chemistry Letters (4,156)

Show more ▾

Subject areas

- ☐ Chemistry (60,328)

Leonid I. Belen'kii, Galina A. Gazieva, ... Natalya O. Soboleva

Research article

Syntheses of Bis(N-heterocyclic carbene)s and their application in main-group chemistry

Journal of Organometallic Chemistry, 20 April 2020, ...

Alexander Röhler, Robert Kretschmer

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Research article

Chapter Three: The Literature of Heterocyclic Chemistry, Part XV, 2015

Advances in Heterocyclic Chemistry, 23 March 2017, ...

Leonid I. Belen'kii, Yulia B. Evdokimenkova

Research article

Chapter Six: The Literature of Heterocyclic Chemistry, Part XIV, 2014

Advances in Heterocyclic Chemistry, 21 November 2016, ...

Leonid I. Belen'kii, Yu B. Evdokimenkova

Book chapter

Chapter Five: The literature of heterocyclic chemistry, part XVII, 2017

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THE CHEMICAL SOCIETY OF JAPAN

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CSJ Journals

**The 101st Annual Meeting**

The Chemical Society of Japan holds the national meeting annually in Spring, which covers all academic fields in Chemistry.

**The 101st CSJ Annual Meeting (2021)**

Online Meeting

**Date** March 19 (Fri.) - 22 (Mon.), 2021

Organized by: The Chemical Society of Japan

**Chemistry Letters**

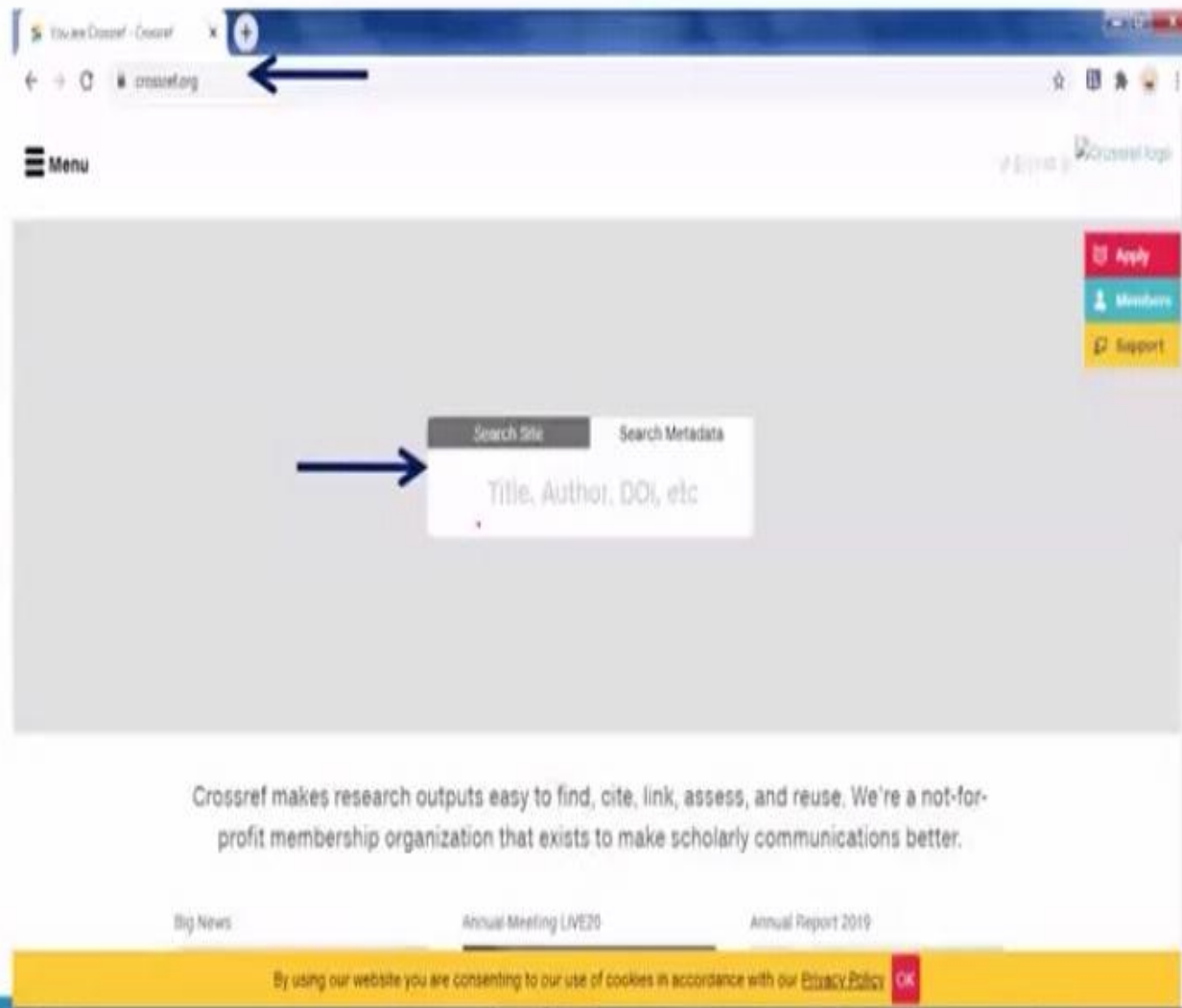
**Bulletin of the Chemical Society of Japan**

**Chemistry**

**BCSJ**

News & Activities Reports

# Instant way to find a publication



# The most commonly visited webpage

The image is a screenshot of a Google search results page. The browser's address bar shows the search URL: `google.com/search?source=hp&sa=X&XXirBEM-H-DPQImFAM&q=antimicrobial+studies+and+QSAR&btnK=Google+Search`. The search bar contains the text "antimicrobial studies and QSAR". Below the search bar, the text "About 4,613,000 results (0.69 seconds)" is displayed. The first search result is titled "Scholarly articles for antimicrobial studies and QSAR", which is circled in red. To the left of this title, there are two red diagonal lines. Below the title, the snippet reads: "Synthesis, antimicrobial, and QSAR studies of ... Kumar - Cited by 113". The second result is titled "antimicrobial evaluation and QSAR studies of 3-ethoxy ... Kumar - Cited by 12". The third result is titled "Synthesis, antimicrobial evaluation and QSAR studies ... Sagra - Cited by 11". The fourth result is titled "Experimental and QSAR studies on antimicrobial activity of ...". Its snippet states: "Twenty eight analogues of benzimidazoles had been synthesized and tested for their antimicrobial activity against four bacteria (Staphylococcus aureus, ... by A Paratchikody - 2008 - Cited by 11 - Related articles". The fifth result is titled "QSAR study of antimicrobial activity of some 3-nitrocoumarins ...". Its snippet states: "A new class of antimicrobial agents: 3-nitrocoumarins and related compounds, has been chosen as a subject of the present study. In order to explore this ... by Z Okorogak - 2007 - Cited by 37 - Related articles". The sixth result is titled "QSAR studies of antimicrobial activity of 1,3-disubstituted-1H ...". The browser's tab bar at the top shows three tabs: "antimicrobial studies and QSAR", "molecules journal - Google Search", and "ugc care list - Google Search".

antimicrobial studies and QSAR

About 4,613,000 results (0.69 seconds)

**Scholarly articles for antimicrobial studies and QSAR**

Synthesis, antimicrobial, and QSAR studies of ... Kumar - Cited by 113

antimicrobial evaluation and QSAR studies of 3-ethoxy ... Kumar - Cited by 12

Synthesis, antimicrobial evaluation and QSAR studies ... Sagra - Cited by 11

published ncbi.nlm.nih.gov

**Experimental and QSAR studies on antimicrobial activity of ...**

Twenty eight analogues of benzimidazoles had been synthesized and tested for their antimicrobial activity against four bacteria (Staphylococcus aureus, ... by A Paratchikody - 2008 - Cited by 11 - Related articles

published ncbi.nlm.nih.gov

**QSAR study of antimicrobial activity of some 3-nitrocoumarins ...**


A new class of antimicrobial agents: 3-nitrocoumarins and related compounds, has been chosen as a subject of the present study. In order to explore this ... by Z Okorogak - 2007 - Cited by 37 - Related articles

www.sciencedirect.com / science / article / pii


**QSAR studies of antimicrobial activity of 1,3-disubstituted-1H ...**

# Always be alert of fake journals

ugcare.unipune.ac.in/app1/home/index



University Grants Commission  
Consortium for Academic and Research Ethics (UGC-CARE)



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per 2020. Journals submitted after that  
If any misleading and/or false met

April 2021 update.  
ie journal's website or its pages the journal will not be eligible for inclusion in the UGC-CARE List.

Message from  
Prof. D.P. Singh, Chairman, UGC

Foreword by  
Prof. Bhushan Patwardhan, Vice Chairman, UGC  
& Chairman, UGC-CARE Empowered Committee

**Alert**

List of cloned journals  
Group I Group II

**Important Notices**

- The UGC-CARE List has only TWO groups, instead of the original FOUR groups to simplify the search process. These are NOT hierarchic or ranked groups.  
UGC-CARE List Group I  
Journals found qualified through UGC-CARE protocols  
UGC-CARE List Group II  
Journals indexed in globally recognised databases
- Recommending any journal, through the proper proforma and process is free and the UGC does not collect any fees for the same. However, it has come to our attention that universities are charging for such recommendations by their ipat and other bodies. Researchers, editors and publishers are requested to note that no such charges have been imposed by the UGC.

**Notifications**

UGC-CARE Public notice : 20<sup>th</sup> April 2020  
UGC-CARE Public notice : December 2019  
UGC-CARE Public notice : 16<sup>th</sup> September 2019  
UGC-CARE Public notice : 14<sup>th</sup> June 2019  
UGC-CARE Public notice : 29<sup>th</sup> November 2018

**Articles**

COMMENTARY: Current Science, 118, 12.

UGC-CARE List

- Select -

Enter search value

# Characteristics of good literature review

■ It should be well written.

■ It should be organized and systematic:

❖ Include broad-based research first and then focus on specific studies that relate to the topic

❖ Organize the literature by the dates the research was published

❖ Organize the review so that it moves from the problem to the solution

■ It should be free from bias.

■ It should include up-to-date references:

❖ All sources cited in the literature review should be listed in the references.

■ It should be logical and empirical.



# Points to be remembered

Be specific and selective. ||

Focus on current topics.

■ Simple and accurate sentence structure.

■ Referring original source.

■ Ensure evidence/data for claims.

■ Focus on sources of evidences/data.

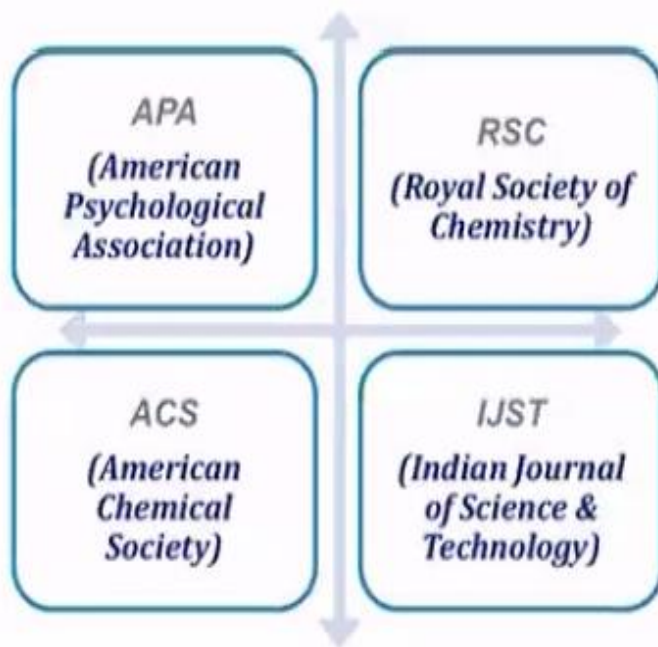
■ Account of contrary evidences/data.





# What is a Citation?

- A citation is a way of giving credit to individuals for their creative and intellectual works that you utilized to support your research.



# APA (American Psychological Association)

- There are 2 ways to cite according to APA style:

- Brief In-text citations (often in parentheses) within the body of essay or paper. ✓

- ✓ List of full citations in the Reference section at the end of your paper.

Author's name followed by its initials. (Year of Publication). Article title followed by full stop.  
Name of Journal in italic form. Volume followed by a comma, Pages No.

Example: Alibali, M. W., Phillips, K.M. & Fischer, A.D. (2009). Learning new problem-solving strategies leads to change in problem representation. *Cognitive Development*, 24, 89-101.

## Most Periodical Citations Will Include:

■ Author

■ Date

■ Title

■ Source information

■ DOI (Digital Object Identifier)

All words in title are lower case--  
except for first word, first word after a  
colon, and proper nouns

Last Name, Abbreviated First

Period  
Year, Month (in parentheses)

Bennett, H. J. (2004, December). Bedwetting: An overview  
of treatment options. *Nutrition Health Review*, 90, 5-7.

doi:10.9911.1137/1  
"digital object identifier"

Source in italics

Commas

Page numbers

Volume # in italics



## Books : What Should Be Included?

Author(s) or Editor(s).

(Date of publication).

Complete title.

Edition (if indicated).

Place of publication:

Publisher.

DOI (if available).

Butler, R. J., Green, D., & Procter, H.

(2007).

*Child within: Taking the young person's perspective by applying personal construct psychology.*

(2<sup>nd</sup> ed).

Chichester, England:

Wiley & Sons.

10.1007/978-1-84882-023-4

## Book Examples

With one author:

Italicize title of book

Use a colon between the main title and the subtitle

Seligman, L. (1999). *Selecting effective treatments: A comprehensive, systematic guide to treating mental disorders*. San Francisco: Jossey-Bass.

With three to six authors:

List all authors Last Name in full, then first (and middle) name(s) abbreviated

Tikling, S. F., Avulsion, D. T., Bonds, B., & Huckabee, T. S. (2008).

Publisher's name

*Unstoppable leakages: Every child deserves plumbing*. Lanham, MD:

Rowman & Littlefield.

If city of publication is not wellknown, add state postal code

Date of publication in parentheses, followed by a period

Remember to indent all lines after the first line 1/2 inch



# RSC (Royal Society of Chemistry)

und

R

INITIALS. Author's surname, Title of Journal (abbreviated in *italics*), Year of Publication, Volume Number (In Bold), Pages No.

Example:

H. Yano, K. Abe, M. Nogi, A.N. Nakagaito, *J. Mater. Sci.*, 2010, **45**, 1-33.

*J. Amer. Chem. Soc.* =  
Am-



# ACS (American Chemical Society )

---

Author's surname. INITIALS.; Title of Publication. Title of Journal (abbreviated in italics).  
Year of Publication (In Bold). Volume Number (In Italics). Pages No.

Example:

Demchuk, Z.; Wu, N.; Pourhashem, G.; Voronov, A. S. Life Cycle Environmental Impact  
Considerations in the Design of Soybean Oil-Based Acrylic Monomers. *ACS Sustainable Chem.*  
*Eng.* **2020**, 8, 12870– 12876.

APS OSA

Author's surname. INITIALS.; Title of Publication. Title of Journal (abbreviated in italics).  
Year of Publication (In Bold). Volume Number (In Italics). Pages No.

Example:

Demchuk, Z.; Wu, N.; Pourhashem, G.; Voronov, A. S. Life Cycle Environmental Impact  
Considerations in the Design of Soybean Oil-Based Acrylic Monomers. ACS Sustainable Chem.  
Eng. 2020, 8, 12870– 12876.

# Some easy ways of Citations:

## .1. Google Scholar

Use Google Scholar's citation symbol for the APA style

Google Scholar Life Cycle Environmental Impact Considerations in the Design of Soybean Oil

Articles

Any time  
Since 2020  
Since 2019  
Since 2018  
Custom range...

Sort by relevance  
Sort by date

☒ include patents  
☒ include citations

Life Cycle Environmental Impact Considerations in the Design of Soybean Oil-Based Acrylic Monomers  
Z. Demchuk, N. Wu, G. Pourhashem  
Improving the sustainability of polymers while maintaining their functionality is a challenge. Life cycle assessment (LCA) methods as a guide to design can be used to evaluate and improve the environmental performance of polymers. This paper presents a study on the life cycle environmental impact of soybean oil-based acrylic monomers. The results show that the environmental impact of these monomers is significantly lower than that of conventional acrylic monomers. This study can be used as a guide for the design of sustainable polymers.

1 99 Cited by 1 All 2 versions

Showing the best result for this search

X Cite

MLA Demchuk, Zoriana, et al. "Life Cycle Environmental Impact Considerations in the Design of Soybean Oil-Based Acrylic Monomers." *ACS Sustainable Chemistry & Engineering* 8.34 (2020): 12870-12876.

APA Demchuk, Z., Wu, N., Pourhashem, G., & Voronov, A. (2020). Life Cycle Environmental Impact Considerations in the Design of Soybean Oil-Based Acrylic Monomers. *ACS Sustainable Chemistry & Engineering*, 8(34), 12870-12876.

Chicago Demchuk, Zoriana, Na Wu, Ghasideh Pourhashem, and Andriy Voronov. "Life Cycle Environmental Impact Considerations in the Design of Soybean Oil-Based Acrylic Monomers." *ACS Sustainable Chemistry & Engineering* 8, no. 34 (2020): 12870-12876.

Harvard Demchuk, Z., Wu, N., Pourhashem, G., and Voronov, A. (2020). Life Cycle Environmental Impact Considerations in the Design of Soybean Oil-Based Acrylic Monomers. *ACS Sustainable Chemistry & Engineering*, 8(34), pp. 12870-12876.

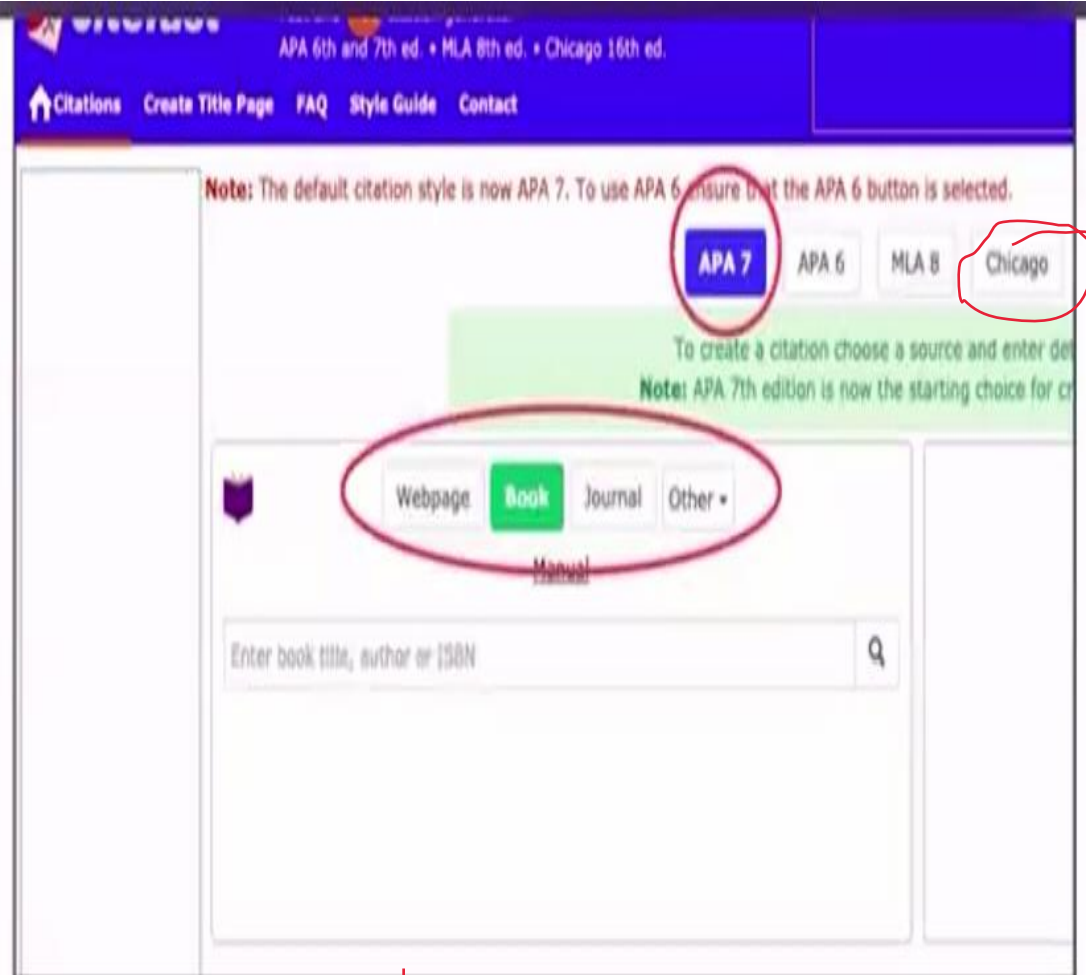
Vancouver Demchuk Z, Wu N, Pourhashem G, Voronov A. Life Cycle Environmental Impact Considerations in the Design of Soybean Oil-Based Acrylic Monomers. *ACS Sustainable Chemistry & Engineering*. 2020 Jul 30;8(34):12870-6.

BibTeX EndNote RefMan RefWorks

## Some easy ways of Citations:

### 2. citefast.com

Use citefast.com's search  
engine for the APA style  
for websites, books,  
journals etc.





# Some easy ways of Citations:

## .3. SCI-HUB

It is a shadow library website that provides free access to millions of research papers and books, without regard to copyright



# Impact Factor

**Impact Factor (IF):** Impact Factor was developed by Eugene Garfield as a quantitative method for comparing the journals. He together with Irving H. Sher, proposed IF in 1955 to rank the journals according to the journal citation.

- It is a measure of the frequency with which the "average article" in a journal has been cited in a particular year or period.
- The impact factor of a journal is calculated by dividing the number of current year citations to the source items published in that journal during the previous two years.
- Let us assume that the total number of articles published in a journal in 2010 and 2011 are 50 (Denominator) and in 2012, the citation to everything published in 2010 and 2011 is 500 (Numerator). The IF of will be 10 in 2013. – Impact Factor is calculated after 3 years of journal launch. New journals should not be expected to have IF from day 1.
- Thomson Reuters ISI releases Journal Citation Reports every 2 years and publishes IF of every journal.
- Impact Factor, once assigned by Thomson Reuters to a journal, will be eligible from the date of its birth.

# Indexing (Citation index)

**Citation indexing** makes links between books and articles that were written in the past and articles that make reference to ("cite") these older publications.

- Many commercial indexing services are available.
- Quality indexing services include PubMed, Scopus, Web of Science, Google scholar, etc.
- A good indexing body ensures that:
  - Journal should have content of high quality
  - Journal should follow peer-review process
  - Subject matter of the journal should be compatible with the scope of Indexing body
  - Journal should have a disciplined publishing history.

# h-index

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- It is defined as the number of papers with citation number equal to or greater than h, as a useful index to characterise the scientific output of a researcher (Hirsch, 2005)
- It takes into account 2 things:
  - The researcher's PRODUCTIVITY (no. of publications a researcher has produced)
  - The IMPACT of the researcher's publications (how many citations the researcher's publications have received)





# How to find h-index?

- You can manually calculate a researcher's **h-index** by gathering a list of all their publications, listing them in order of citation counts and then finding the point at which the highest no. of papers (**h**) have been cited at least **h** time each.

- A number of research databases calculate the **h-index** for you.

## Example-1: Scopus

1. Do Author search and click then click on the name
2. H-index is provided underneath the research heading (a no. of other indicators of research output are also provided here)

## Example-2: Web of Science

1. Search for researcher's name and select the Author from drop down menu
2. Click 'create citation report'

## Example-3: Google Scholar

1. Google Scholar Profile (only when the researcher has created one)
2. If no scholar profile, download 'Publish or Perish' and use it to calculate a researcher's h-index using the data



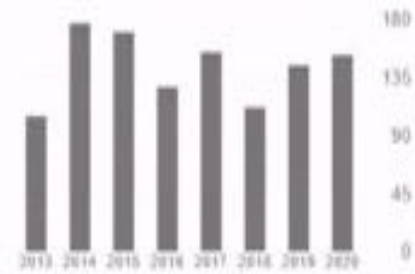
# h-index

Paper	Number of citations
Paper 1	101
Paper 2	86
Paper 3	77
Paper 4	56
Paper 5	16
Paper 6	12
Paper 7	8
Paper 8	4
Paper 9	4
Paper 10	1

Cited by

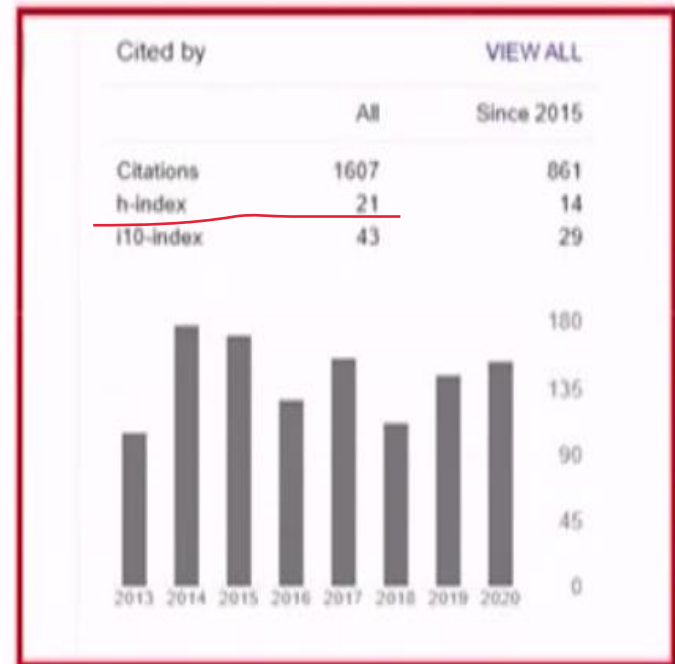
[VIEW ALL](#)

	All	Since 2015
Citations	1607	861
h-index	21	14
i10-index	43	29



# h-index

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Paper 1	101
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# SciFinder Search

- Sci-Finder, a resource from the Chemical Abstracts Service (CAS), is a curated database of chemical and bibliographic information that covers several scientific and biomedical fields, with an emphasis on chemistry.
- Sci-Finder contains a wide variety of content from journal articles to information on chemical structures, properties, and reactions. There are three separate search sections in SciFinder: references, substances, and reactions.



## Overview

### Steps/Stages

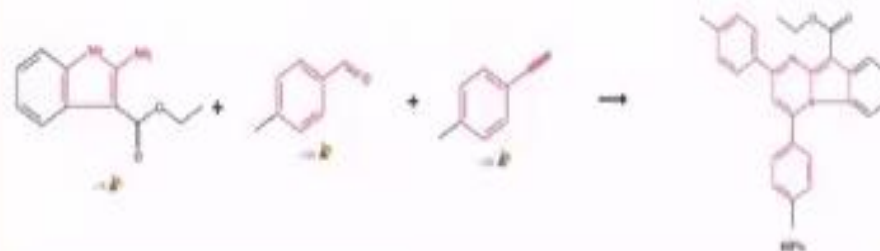
1.1 4-Pyridone, 5.0M, 4 h, 100°C  
1.2 K<sub>2</sub>CO<sub>3</sub>, 0.5M, 5.0M, 1 h, 100°C

### Notes

Reagents: 1, Reagents: 2, Catalysts: 3, Solvents: 4, Steps: 5, Steps: 6, Final stages in any one step: 7

### References

Synthesis of Polyfunctionalized Pyridones via a Tandem Reaction of Michael Addition and Aldol Condensation: Cyclic-Related Work by Nucleocondensation  
N. Yoshida, J. H. Kim  
In: Journal of Organic Chemistry, 67(2), 2002, 2002



## Steps/Stages

1.1 C<sub>10</sub>H<sub>10</sub>O<sub>4</sub>, 5.0M, 10 min, 100°C

## Notes

Optimized on Catalysts, Solvents and Reagents: 1, Reagents: 2, Catalysts: 3, Solvents: 4, Steps: 5, Steps: 6, Final stages in any one step: 7

## References

Novel synthesis of polycyclic naphthalene derivatives via a tandem reaction of Michael addition and aldol condensation: Cyclic-Related Work by Nucleocondensation  
N. Yoshida, J. H. Kim  
In: Journal of Organic Chemistry, 67(2), 2002, 2002

# Proof-reading and Plagiarism checking

Editing and proofreading are fundamental aspects of good academic practice.

- **Editing** is the process of continually revising and improving your written work. It is often an activity that forms a major part of the writing process.
- **Proofreading** is the final check before printing and submission. It is a process that helps remove errors and improve presentation.

Plagiarism includes:

1. Using another writer's words without proper citation
2. Using another writer's ideas without proper citation
3. Citing a source but reproducing the exact word without quotation marks
4. Borrowing the structure of another author's phrases/sentences without giving the source
5. Borrowing all or part of another student's paper
6. Using paper-writing service

# Commonly made errors

- Review is not logically organized
- Review is not focused on most important facets of the study
- Review does not relate literature to the study
- Too few references or outdated references cited
- \* ■ Review is not written in author's own words
- Review reads like a series of disjointed summaries
- Review does not argue a point
- Recent references are omitted

## Correct way:

After reviewing the literature, summarize what has been done, what has not been done, and what needs to be done

Remember you are arguing your point of why your study is important!

Then pose a formal research question or state a hypothesis—be sure this is clearly linked to your literature review



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# Revisiting- Research Problem

## Research:

- The systematic, rigorous investigation of a problem in order to generate new knowledge or validating existing knowledge.
- It is an endeavor to discover new facts by the scientific study of a subject by a course of critical investigation.

## Research Question:

- Something you want to know about your discipline or about a specific area within your discipline.
- A 'Research Question' should be an issue that you are genuinely curious about.
- An idea for your research problem can come from insights when you engage with a lot of literature, observations and published facts.
- Research problem should be clear, focused and arguable.

# Research Methodology

## Research Methodology:

- It is the master plan specifying the methods and procedures for collecting and analyzing the needed information.
- It yields maximum information and saves effort, time and money. //

## Research Method vs Methodology:

- Research Methods are the techniques and methods adopted by a researcher for conducting the research.
- Research Methodology is the way in which research problems are solved systematically and scientifically.

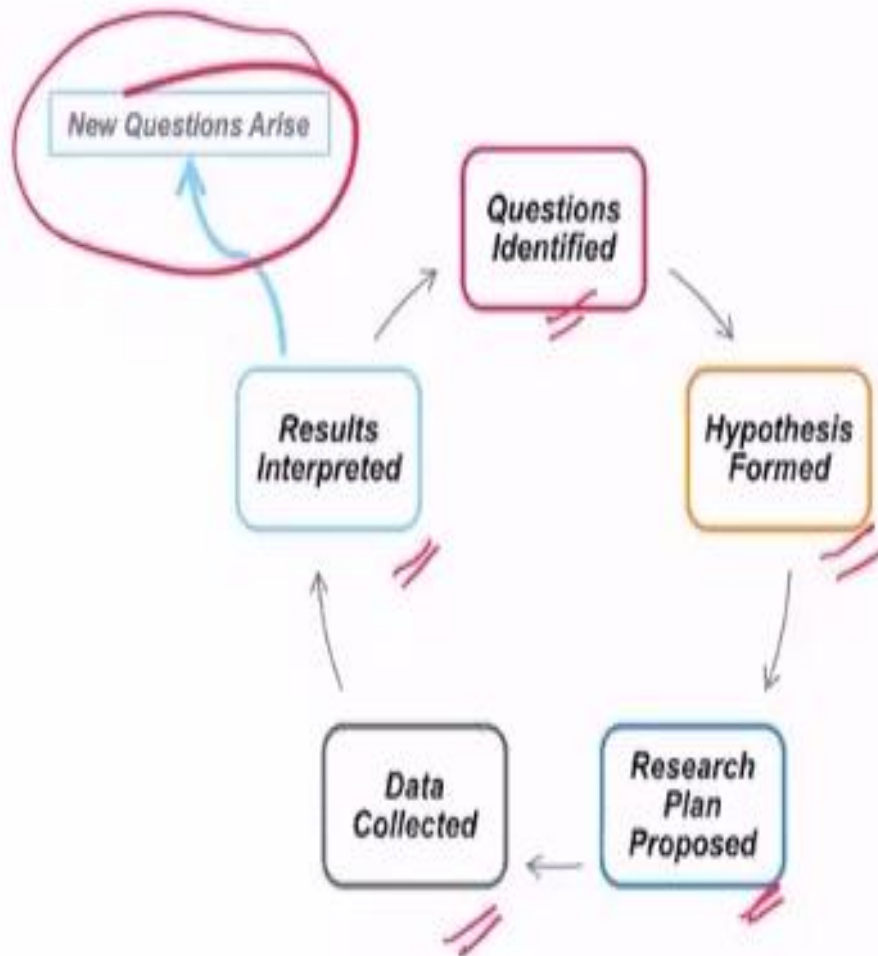
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# Logical steps of Research



In an ideal world:

Hypotheses (On the platform)

Theories (Seated)

Laws (Running)





## Systematic

Research is structured with specified steps to be taken in a specified sequence in accordance with the well defined set of rules.



## Logical

Research is guided by the rules of logical reasoning



## Empirical

Research is related basically to one or more aspects of a real situation and deals with concrete data that provides a basis for external validity.



## Replicable

This characteristic allows research results to be verified by replicating the study and thereby building a sound basis for decisions.

# Criteria of Good Research



# Criteria of Good Research

1. Research design is thoroughly planned.

2. Purpose is clearly defined.

3. High ethical standards are applied.

4. Limitations are frankly revealed.

5. Findings are presented clearly.

6. Conclusions are justified.

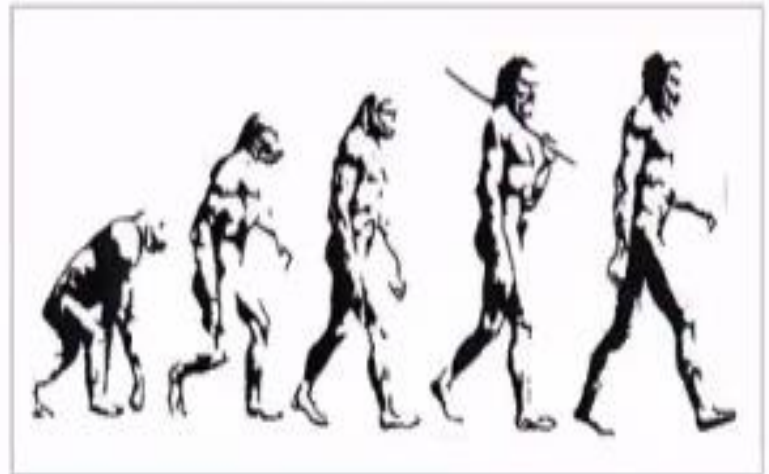
7. Adequate analysis is done.

8. Research process is detailed.

9. Researcher's experience is reflected.

*Not something you do now and forget about...*

*Remember your field is constantly evolving and changing...*



# Review of Literature (Ph.D. Course Work) On

## A COMPREHENSIVE SYNTHETIC ACCOUNT OF FUSED IMIDAZOLE SCAFFOLDS: A REVIEW

Submitted By  
**Ms. Deepika Geedkar**

Under the supervision of  
**Dr. Pratibha Sharma**

School of Chemical Sciences  
Devi Ahilya Vishwavidyalaya, Indore  
(M.P.)  
(May, 2019)

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Contents Review

## TITLE: REVIEW OF LITERATURE ON SYNTHESIS OF FUSED IMIDAZOLE DERIVATIVES

### 1. INTRODUCTION

Imidazole chemistry is the largest chemical division of organic chemistry and is of immense importance from biological and industrial points of view. Amongst heterocycles, imidazoles amongst have captured especially in development of activity as well as in the understanding of life processes and in the efforts to improve the quality of life.

In particular, heterocyclic compounds are of vital importance from the view point of their involvement in various biological life processes and transformations leading to and causing the increasingly sophisticated products.<sup>1</sup> A large numbers of heterocyclic compounds are well known and this number is increasing rapidly because they hold a special place among pharmacologically significant natural products and synthetic compounds.<sup>2</sup>

The chemistry of heterocyclic compounds is as light as that of aliphatics or aromatics in nature, depending on their electronic conditions. Their study is of great interest both from the theoretical as well as practical viewpoints. Heterocyclic compounds are very widely distributed in nature and are essential to life in various ways. Compounds such as alkaloids, antibiotics, natural acids, vitamins, hormones, neurotransmitters, and a large number of synthetic drugs and dyes contain heterocyclic rings.<sup>3</sup> Imidazole, being a five-membered aromatic heterocycle, is found in numerous natural as well as in drug molecules. There are also a large number of heterocyclic compounds with other heteroatoms present, such as oxadiazoles, selenadiazoles, telluradiazoles, and many are valuable compounds in synthesis. Imidazoles are omnipresent naturally in all branches of chemistry and biochemistry as well as in our lives. Another important property of heterocyclic compounds is their anomalous participation in a wide range of reactions. Depending upon pH of the medium, they may behave as acids or bases, form salts or esters. Some interact readily with electrophiles, others with nucleophiles, yet others with both. Some are readily oxidized, but most reduction, while others can be readily hydrogenated but are stable towards the action of oxidizing agents. The ability of many heterocyclic compounds to produce stable complexes with metal ions has great theoretical significance.<sup>4</sup>

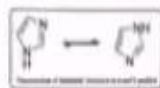
The medicinal activities and reactions used in industrial applications ranging from corrosion inhibitors, solvents, dyes and pigments are heterocyclic in nature. Also, the presence of heterocyclic core in most of organic compounds which are of interest in chemistry, biology, optics, pharmacology, material science and so on is

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Contents Review

Imidazole and heterocyclic systems happen in the presence of electron withdrawing group in its nucleus. Imidazoles have M, N, O, S, Si as a weak base and heterocyclic substituents. Since position 2 and 3 are equivalent.



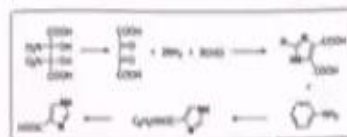
If its spectroscopic parameters are  $\lambda_{max}$  of 207 nm,  $\epsilon_{max}$  130, 140, 1031 cm<sup>-1</sup>,  $\nu_{max}$  3.2, 2.9, 2.86, most spectroscopy is studied for heterocyclic compounds containing one heteroatom in detail, and to date containing two or more heteroatoms.<sup>12</sup>

### 5. REVIEW OF LITERATURE ON SYNTHESIS OF FUSED IMIDAZOLE DERIVATIVES

Imidazoles were prepared in 1859 from glyoxal and ammonia. Various approaches are available for synthesis of imidazoles in, Barbaschi's synthesis, dehydration of isoxanthones, from alpha halo ketones, Wallach synthesis, from amine oxides and from alpha, beta-unsaturated carbonyl. Various of the synthetic procedures are shown below:<sup>13</sup>

Contents Review

Imidazoles can be prepared by the action of ammonia on a mixture of formaldehyde and acetic acid and then heating the dihydroxy acid to replace in presence of oxygen.<sup>14,15</sup>



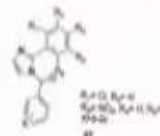
### 6. REVIEW OF LITERATURE ON PHARMACOLOGICAL ACTIVITIES OF IMIDAZOLE SCAFFOLDS AND ITS ANALOGUES

The literature survey depicts the imidazole derivatives shows various pharmacological activities such as anti-viral, anti-inflammatory and analgesic, anti-depressant, anti-fungal and anti-bacterial, anti-cancer, anti-obesity and anti-obesity activity.

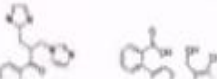
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Contents Review

Imidazole and heterocyclic systems happen in the presence of electron withdrawing group in its nucleus. Imidazoles have M, N, O, S, Si as a weak base and heterocyclic substituents. Since position 2 and 3 are equivalent.



The heterocyclic derivatives were synthesized and screened for analgesic and antipyretic activity. All compounds showed tendency to good activity against Carlsberg anti-viral and Carlsberg glucose. Imidazoles were used as reference drug.<sup>16</sup>



Contents Review

very well known. Moreover, they act as organic conductors, semiconductors, corrosion resists, photoconductive cells and organic light-emitting diodes (OLEDs), light-emitting systems, natural dye carriers, chemically convertible materials and liquid crystalline compounds.<sup>17</sup> For more than a century, chemistry of heterocyclics has constituted one of the largest areas of research in organic chemistry and is continuously expanding which can be seen from enormous amount of research work being done in this field.

All these results prove that heterocyclic compounds are excellent scaffold for choosing a wide variety of compounds and speeding up research activity.

Heterocyclics are common structural units in medicinal drugs and in industrial chemistry largely in the drug discovery process. Almost two third of top small molecule drugs contain at least one heterocycle. Fragment to these structures.<sup>18</sup> Recently anti-HIV<sup>19</sup>, anti-fungal<sup>20</sup>, anti-viral<sup>21</sup>, anti-cancer<sup>22</sup>, anti-inflammatory<sup>23</sup>, anti-obesity<sup>24</sup>, anti-depressant<sup>25</sup>, anti-fungal<sup>26</sup>, anti-cancer<sup>27</sup>, anti-obesity<sup>28</sup>, anti-depressant<sup>29</sup>, anti-fungal<sup>30</sup>, anti-cancer<sup>31</sup>, anti-obesity<sup>32</sup>, anti-depressant<sup>33</sup>, anti-fungal<sup>34</sup>, anti-cancer<sup>35</sup>, anti-obesity<sup>36</sup>, anti-depressant<sup>37</sup>, anti-fungal<sup>38</sup>, anti-cancer<sup>39</sup>, anti-obesity<sup>40</sup>, anti-depressant<sup>41</sup>, anti-fungal<sup>42</sup>, anti-cancer<sup>43</sup>, anti-obesity<sup>44</sup>, anti-depressant<sup>45</sup>, anti-fungal<sup>46</sup>, anti-cancer<sup>47</sup>, anti-obesity<sup>48</sup>, anti-depressant<sup>49</sup>, anti-fungal<sup>50</sup>, anti-cancer<sup>51</sup>, anti-obesity<sup>52</sup>, 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# Recent advances on the transition-metal-catalyzed synthesis of imidazopyridines: an updated coverage

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## Review

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## Abstract

A comprehensive account of recent advances in the synthesis of imidazopyridines, assisted through transition-metal-catalyzed multicomponent reactions, C–H activation/functionalization and coupling reactions are highlighted in this review article. The basic illustration of this review comprises of schemes with concise account of explanatory text. The schemes depict the reaction conditions along with a quick look into the mechanism involved to render a deep understanding of the catalytic role. At some instances the variations of certain features have been illustrated through tables, i.e., selectivity of catalyst, loading of the catalyst and percentage yield with different substrates. Each of the reported examples has been rigorously analyzed for reacting substrates, reaction conditions and transition metals used as the catalyst. This review will be helpful to the chemists in understanding the challenges as-



# Conclusion

- A good review of literature is the foundation of a good research.
- A literature review is an account of previous efforts and achievements of researchers on a phenomenon.
- Review helps to compare with the other previous studies.

**Research inculcates scientific and inductive thinking and promotes the development of logical habits of thinking and organization.**





*"All progress is born of inquiry. Doubt is often better than over-confidence, for it leads to inquiry, and inquiry leads to invention"*

*– Hudson Maxim*