

# BASIC TUTORIAL FOR BIBLIOGRAPHIC SEARCH

PUBMED USE



1st Edition  
2021



# **BASIC TUTORIAL FOR BIBLIOGRAPHIC SEARCH**

## **PUBMED USE**



1st Edition  
2021

## PARTNERSHIP



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# Preface

Bibliographic Research in Databases - Basic Tutorial for Using PubMed, 1st edition, is the first e-book in a collection for students and researchers in the areas of health and biological sciences.

The objective of this tutorial is to help students and researchers to improve the results of bibliographic searches of scientific articles more quickly and efficiently. The content was prepared in accessible language and organized into topics to facilitate access to information.

The reader will get to know the PubMed database, learn how to perform a simple search by topic of interest and by author, as well as techniques that enable search optimization and, finally, how to store articles.

We hope that through the distribution of this material, digitally and free of charge, it will enable a more democratic access to knowledge.



# Summary

|   |           |
|---|-----------|
| <b>Definition.....</b>                        | <b>6</b>  |
| <b>Site.....</b>                              | <b>7</b>  |
| <b>Homepage.....</b>                          | <b>8</b>  |
| <b>PubMed central.....</b>                    | <b>11</b> |
| <b>NCBI.....</b>                              | <b>13</b> |
| <b>Initial search .....</b>                   | <b>14</b> |
| <b>Bibliographic Search Optimization.....</b> | <b>19</b> |
| <b>Mesh Terms.....</b>                        | <b>16</b> |
| <b>Boolean Operators.....</b>                 | <b>23</b> |
| <b>Advanced search.....</b>                   | <b>24</b> |
| <b>1st topic search technique.....</b>        | <b>28</b> |
| <b>2nd topic search technique.....</b>        | <b>31</b> |
| <b>Author search technique.....</b>           | <b>38</b> |
| <b>Storage.....</b>                           | <b>42</b> |



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PubMed access site

**<https://pubmed.ncbi.nlm.nih.gov>**



Source: [carececo.org](http://carececo.org)

**PubMed.gov**

Advanced

PubMed® comprises more than 33 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full text content from PubMed Central and publisher web sites.



#### Learn

About PubMed  
FAQs & User Guide  
Finding Full Text



#### Find

Advanced Search  
Clinical Queries  
Single Citation Matcher



#### Download

E-utilities API  
FTP  
Batch Citation Matcher



#### Explore

MeSH Database  
Journals

## Homepage

After accessing the site, this is the PubMed initial screen, where the user has at his disposal several features to improve his search for articles, descriptor search or MESH terms, indexed journals and database.

As we will see in the following figure, in the drop-down menu (on the left), there is a search box with several database options for research in areas of biomedicine such as PubMed Central (PMC) and molecular biology (NCBI).

If the user has difficulty finding results or needs specific results, for searches with metagenome or transcriptome, he should opt for database selection.

**PubMed.gov**

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Clinical Queries  
Single Citation Matcher



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E-utilities API  
FTP  
Batch Citation Matcher



#### Explore

MeSH Database  
Journals

In 2019, Pubmed updated its interface and some features on its platform, this new version proves to be more intuitive, accessible and uncomplicated. To access the new layout, just click on the button labeled New PubMed that is highlighted by the arrow on this page.

A positive difference in the new layout of the platform is that below the initial search bar we find 4 icons for different tools and functionalities such as the "FIND" icon we have the advanced search tool and the "EXPLORE" icon we have the "MESH" tool TERMS.

Such highlighted icons prove to be more didactic to the user, if we compare with the previous "layout." Just below we see two columns showing the articles, the featured articles and the most recent literature of the journals.



**PubMed.gov**

Search

Advanced

PubMed® comprises more than 33 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full text content from PubMed Central and publisher web sites.



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[FAQs & User Guide](#)  
[Finding Full Text](#)



### Find

[Advanced Search](#)  
[Clinical Queries](#)  
[Single Citation Matcher](#)



### Download

[E-utilities API](#)  
[FTP](#)  
[Batch Citation Matcher](#)



### Explore

[MeSH Database](#)  
[Journals](#)

## Trending Articles

PubMed records with recent increases in activity

**COVID-19 Mortality Risk Correlates Inversely with Vitamin D3 Status, and a Mortality Rate Close to Zero Could Theoretically Be Achieved at 50 ng/mL 25(OH)D3: Results of a Systematic Review and Meta-Analysis.**

Borsche L, et al. *Nutrients*. 2021. PMID: 34684596 **Free PMC article.** Review.

**Hospital Outbreak of the SARS-CoV-2 Delta Variant in Partially and Fully Vaccinated Patients and Healthcare Workers in Toronto, Canada.**

Susky EK, et al. *Infect Control Hosp Epidemiol*. 2021. PMID: 34706787

**SARS-CoV-2 Y453F is not the "cluster 5" variant.**

Lassaunière R. *J Biol Chem*. 2021. PMID: 34700073 **Free PMC article.** No abstract available.

**Ticagrelor versus Clopidogrel in CYP2C19 Loss-of-Function Carriers with Stroke or TIA.**

Wang Y, et al. *N Engl J Med*. 2021. PMID: 34708996

**The Association between Vitamin D and Zinc Status and the Progression of Clinical Symptoms among Outpatients Infected with SARS-CoV-2 and Potentially Non-Infected Participants: A Cross-Sectional Study.**

Golabi S, et al. *Nutrients*. 2021. PMID: 34684369 **Free PMC article.**

## Latest Literature

New articles from highly accessed journals

[Blood](#) (1)

[Cancer Res](#) (5)

[Cell](#) (7)

[Cochrane Database Syst Rev](#) (1)

[J Biol Chem](#) (8)

[JAMA](#) (3)

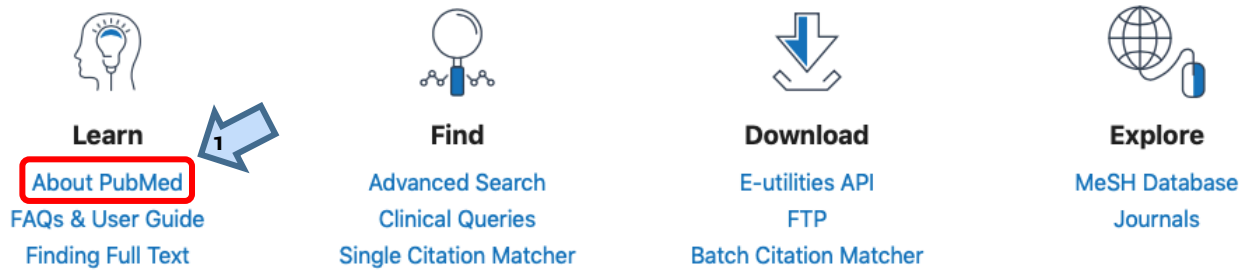
[Nature](#) (6)

[PLoS One](#) (64)

[Pediatrics](#) (2)

[Proc Natl Acad Sci U S A](#) (5)

# PubMed Central



1 To access PubMed Central (PMC), go to the home screen and scroll to the "About PubMed" option, select to access the PMC platform.



Log in



Advanced

Search

User Guide

## PubMed Overview

PubMed is a free resource supporting the search and retrieval of biomedical and life sciences literature with the aim of improving health—both globally and personally.

The PubMed database contains more than 33 million citations and abstracts of biomedical literature. It does not include full text journal articles; however, links to the full text are often present 2 available from other sources, such as the publisher's website or **PubMed Central (PMC)**.

Available to the public online since 1996, PubMed was developed and is maintained by the [National Center for Biotechnology Information \(NCBI\)](#), at the [U.S. National Library of Medicine \(NLM\)](#), located at the [National Institutes of Health \(NIH\)](#).

2 On the "About PubMed" page, click the PubMed Central link to access the PMC homepage. The PMC is a free, full-text archive of the U.S. National Institutes of Health (NIH/NLM) National Library of Medicine and Life Sciences journal literature accessible to anyone, anywhere via a web browser.

## PMC Overview

PubMed Central® (PMC) is a free full-text archive of biomedical and life sciences journal literature at the U.S. National Institutes of Health's National Library of Medicine (NIH/NLM). In keeping with NLM's legislative mandate to collect and preserve the biomedical literature, PMC serves as a digital counterpart to NLM's extensive print journal collection.

PMC was developed and is managed by NLM's National Center for Biotechnology Information (NCBI).

## About the Content

Since its inception in 2000, PMC has grown from comprising only two journals, *PNAS: Proceedings of the National Academy of Sciences* and *Molecular Biology of the Cell*, to an archive of articles from thousands of journals.

Today, PMC contains more than 6 million full-text records, spanning several centuries of biomedical and life science research (late 1700s to present). Content is added to the archive through

Its content is linked to other databases such as NCBI and accessed through the *entrez* search and retrieval systems, increasing the user's ability to freely discover, read and build their portfolio of biomedical knowledge.

Documents included in the PMC undergo indexing and formatting to improve metadata and unique identifiers that enrich structured data and results for each bibliography search on specific topics.

PMC is not the same platform as PubMed, this difference is based on the fact that files and articles found in PubMed are physically stored elsewhere, which is not the case with PMC.

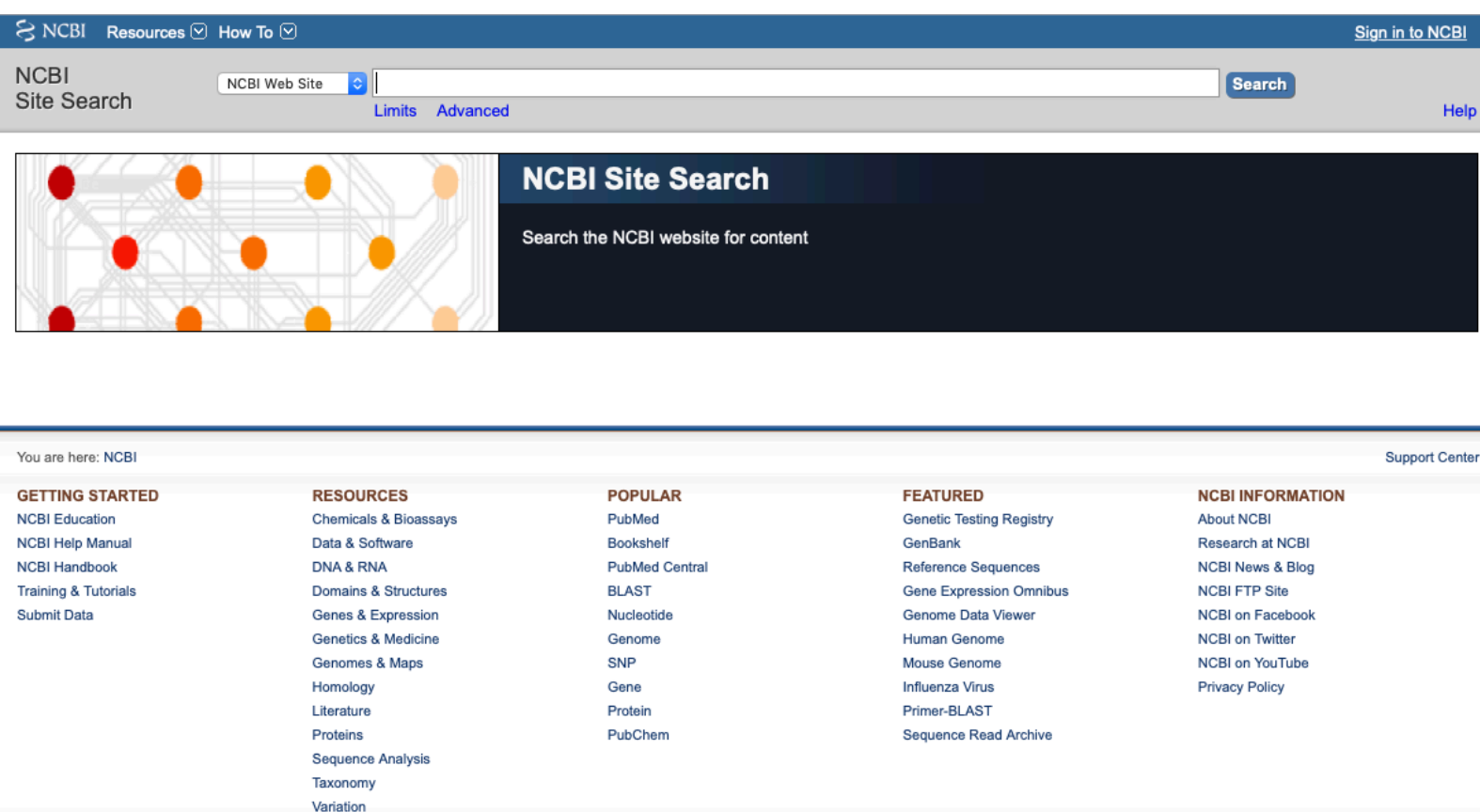
Despite PubMed's layout change, the PMC remains with the old design, so the bibliographic search strategies have not undergone considerable changes..



# National Center for Biotechnology Information or NCBI

The National Center for Biotechnology Information or NCBI is a database that provides a vast set of online resources, information and biological data, including the GenBank Nucleic Acid Sequence Database®.

In addition to the data contained in GenBank®, the NCBI contains biomedical research articles as well as other types of information relevant to research in the fields of biotechnology.



The screenshot displays the NCBI website interface. At the top, a blue navigation bar contains links for 'NCBI', 'Resources', and 'How To'. A search bar is positioned on the right with a 'Search' button. Below this, a dark blue banner features the text 'NCBI Site Search' and 'Search the NCBI website for content'. The main content area is divided into four columns: 'GETTING STARTED' (with links like NCBI Education, NCBI Help Manual, NCBI Handbook, Training & Tutorials, and Submit Data), 'RESOURCES' (with links like Chemicals & Bioassays, Data & Software, DNA & RNA, Domains & Structures, Genes & Expression, Genetics & Medicine, Genomes & Maps, Homology, Literature, Proteins, Sequence Analysis, Taxonomy, and Variation), 'POPULAR' (with links like PubMed, Bookshelf, PubMed Central, BLAST, Nucleotide, Genome, SNP, Gene, Protein, and PubChem), and 'FEATURED' (with links like Genetic Testing Registry, GenBank, Reference Sequences, Gene Expression Omnibus, Genome Data Viewer, Human Genome, Mouse Genome, Influenza Virus, Primer-BLAST, and Sequence Read Archive). A fifth column on the right, 'NCBI INFORMATION', includes links like About NCBI, Research at NCBI, NCBI News & Blog, NCBI FTP Site, NCBI on Facebook, NCBI on Twitter, NCBI on YouTube, and Privacy Policy. A footer bar at the bottom indicates 'You are here: NCBI' and provides a 'Support Center' link.

NCBI Resources How To Sign in to NCBI

NCBI Site Search NCBI Web Site Search Limits Advanced Help

**NCBI Site Search**


Search the NCBI website for content

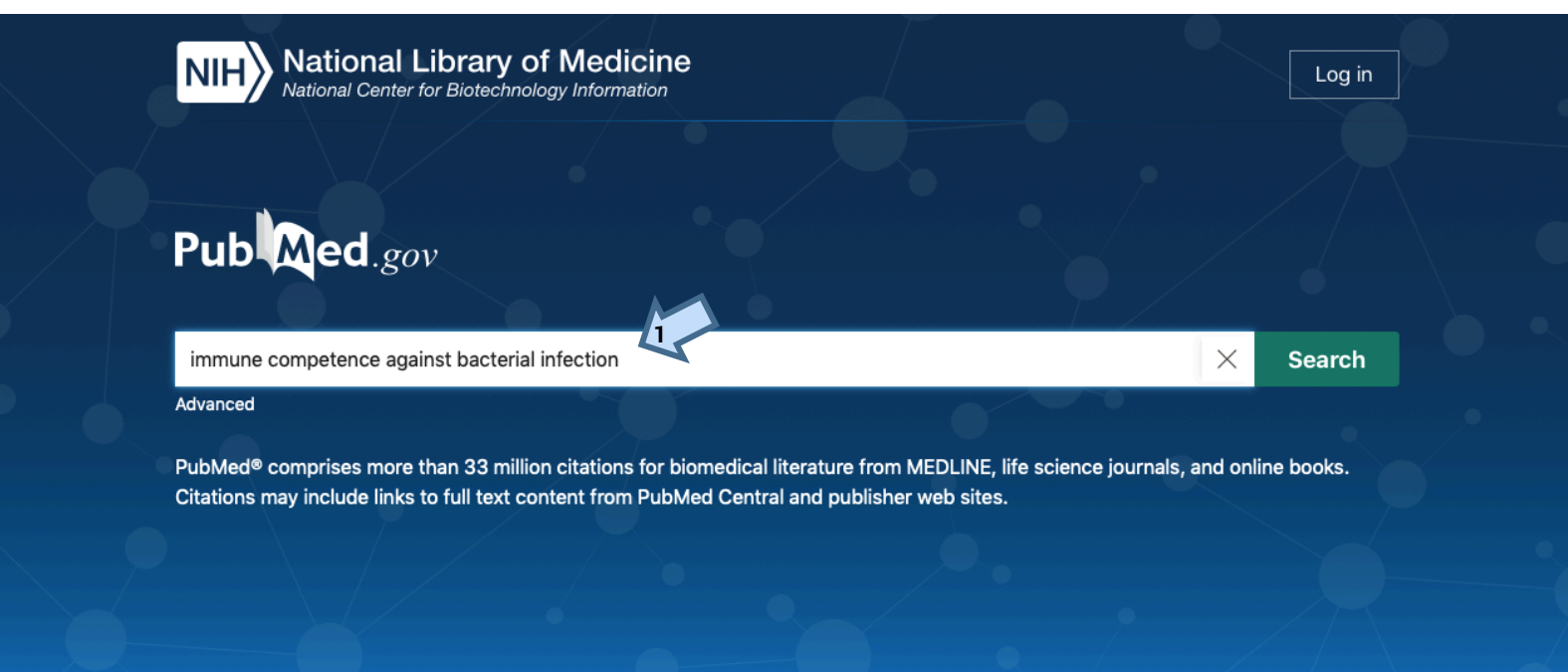
You are here: NCBI Support Center

| GETTING STARTED      | RESOURCES             | POPULAR        | FEATURED                 | NCBI INFORMATION |
|----------------------|-----------------------|----------------|--------------------------|------------------|
| NCBI Education       | Chemicals & Bioassays | PubMed         | Genetic Testing Registry | About NCBI       |
| NCBI Help Manual     | Data & Software       | Bookshelf      | GenBank                  | Research at NCBI |
| NCBI Handbook        | DNA & RNA             | PubMed Central | Reference Sequences      | NCBI News & Blog |
| Training & Tutorials | Domains & Structures  | BLAST          | Gene Expression Omnibus  | NCBI FTP Site    |
| Submit Data          | Genes & Expression    | Nucleotide     | Genome Data Viewer       | NCBI on Facebook |
|                      | Genetics & Medicine   | Genome         | Human Genome             | NCBI on Twitter  |
|                      | Genomes & Maps        | SNP            | Mouse Genome             | NCBI on YouTube  |
|                      | Homology              | Gene           | Influenza Virus          | Privacy Policy   |
|                      | Literature            | Protein        | Primer-BLAST             |                  |
|                      | Proteins              | PubChem        | Sequence Read Archive    |                  |
|                      | Sequence Analysis     |                |                          |                  |
|                      | Taxonomy              |                |                          |                  |
|                      | Variation             |                |                          |                  |

# Initial Research

To start a simple search on the PubMed homepage just follow these steps:

1. Identifying the key concepts of your research is a critical step. For example, if the research topic is “immune competence against bacterial infection”, the key concepts of this research will be “immune system” and “bacterial infection”;
2. Translate the key concepts into English “immune competence against bacterial infection”;
3. Then fill in the text box on the home page and to start your bibliographic search, just click on **Search**, as in the following example. 



MY NCBI FILTERS

RESULTS BY YEAR



TEXT AVAILABILITY

- ☐ Abstract
- ☐ Free full text
- ☐ Full text

ARTICLE ATTRIBUTE

- ☐ Associated data

ARTICLE TYPE

- ☐ Books and Documents
- ☐ Case Reports
- ☐ Clinical Trial
- ☐ Meta-Analysis
- ☐ Randomized Controlled Trial
- ☐ Review
- ☐ Systematic Review

PUBLICATION DATE

- ☐ 1 year
- ☐ 5 years
- ☐ 10 years
- ☐ Custom Range

3,087 results

☐ **STING: infection, inflammation and cancer.**

1 Barber GN.

Cite Nat Rev Immunol. 2015 Dec;15(12):760-70. doi: 10.1038/nri3921.

PMID: 26603901 [Free PMC article.](#) [Review.](#)

Share The rapid detection of microbial agents is essential for the effective initiation of host defence mechanisms against **infection**. Understanding how cells detect cytosolic DNA to trigger innate **immune** gene transcription has important implications - not only for compreh ...

Primarily, the bibliographic search must begin with the definition of a research topic in a clear and defined way and once the topic is defined, the bibliographic survey can start, which may even have a satisfactory result, but if not, it can be changed. and minimized through the use of search filters.

Even with the use of filters, the use of the initial text bar and the writing of the theme in running text, can be one of the alternatives of bibliographic search for researchers and authors, but as we can see in the example above, the amount of results (3.087 articles) may be inconvenient to obtain adequate results.

In the sidebar on the left, we can see options for refining the search. The refinement can be done regarding the type of article or study, publication date, text availability, language and other filters.

immune competence against bacterial infection



Search

Advanced

PubMed® comprises more than 33 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full text content from PubMed Central and publisher web sites.

When performing a simple search, as demonstrated on page 13, we see more changes in the interface where we can see a graph to refine the publication date of the search. The other search filters such as article or study type or text availability remain the same.

The novelty of the new interface is the addition of “Sex” filters; “Subject”; “Journal” and “Age” which will optimize the user's search, as the user can choose more than one filter option, as well as reset their filters by clicking on the **Reset filters** button. To access the new filters folder, click on the button **Additional filters** which will be in the lower left corner of the screen and is marked on the following page.

#### PUBLICATION DATE

- ☐ 1 year
- ☐ 5 years
- ☐ 10 years

Additional filters

ARTICLE TYPE

SPECIES

LANGUAGE

SEX

SUBJECT

JOURNAL

AGE

☐ Dental journals

☐ MEDLINE

☐ Nursing journals

Cancel

Show

ARTICLE TYPE

SPECIES

LANGUAGE

SEX

SUBJECT

JOURNAL

AGE

☐ AIDS

☐ Cancer

☐ Systematic Reviews

Cancel

Show

ARTICLE TYPE

SPECIES

LANGUAGE

SEX

SUBJECT

JOURNAL

AGE

☐ Female

☐ Male

Cancel

Show

ARTICLE TYPE

SPECIES

LANGUAGE

SEX

SUBJECT

JOURNAL

AGE

☐ Child: birth-18 years

☐ Newborn: birth-1 month

☐ Infant: birth-23 months

☐ Infant: 1-23 months

☐ Preschool Child: 2-5 years

☐ Child: 6-12 years

☐ Adolescent: 13-18 years

☐ Adult: 19+ years

☐ Young Adult: 19-24 years

☐ Adult: 19-44 years

☐ Middle Aged + Aged: 45+ years

☐ Middle Aged: 45-64 years

☐ Aged: 65+ years

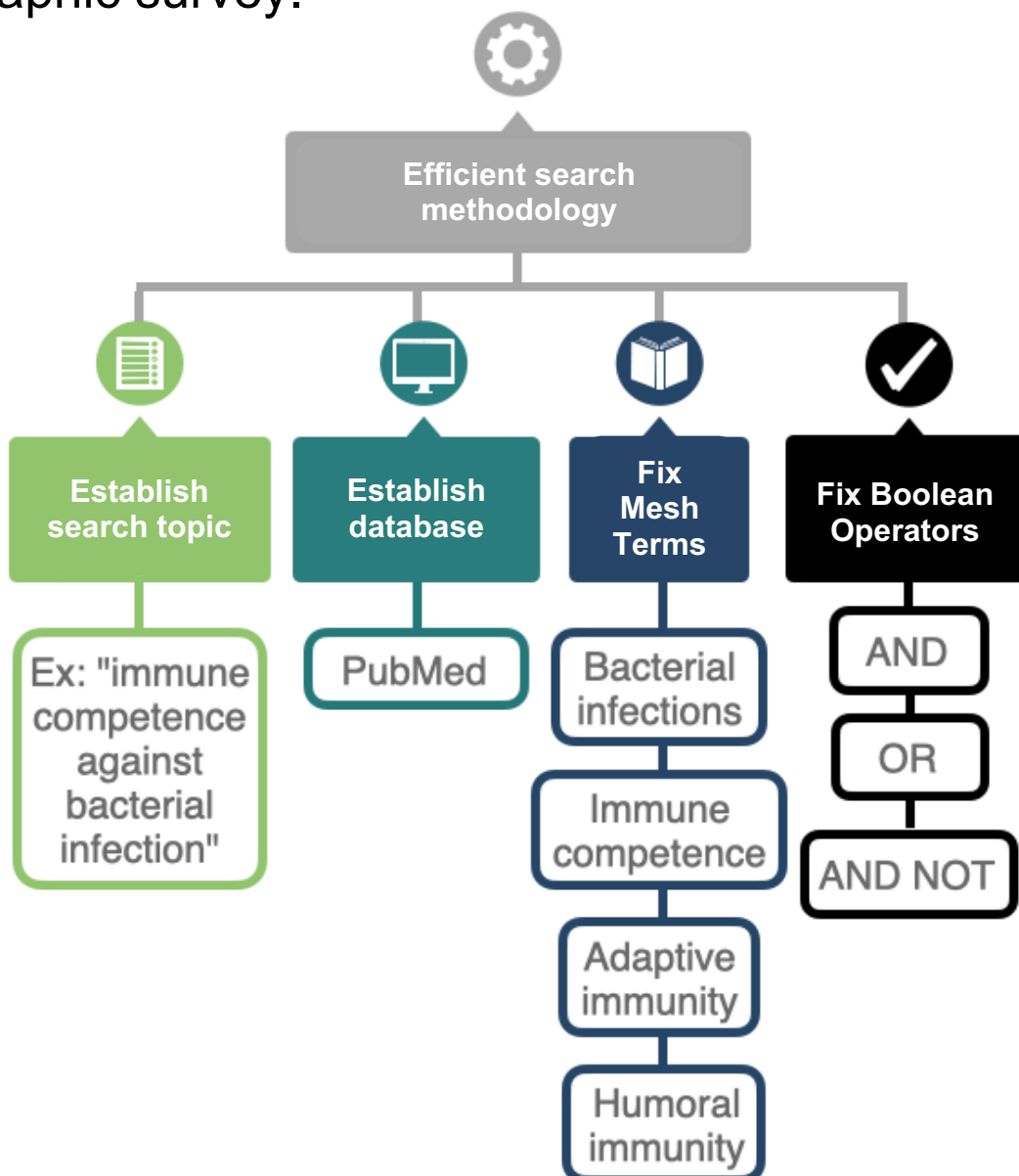
☐ 80 and over: 80+ years

Cancel

Show

# Bibliographic Search Optimization

In the first step of the bibliographic search, after selecting the research topic, it is recommended to select a research language (generally the use of the English language due to the universal language factor), identify the descriptors or mesh terms or keywords that will express the content desired, select the Boolean operators that will unite the previously selected descriptors and define the informational source, such a strategy can improve the chances of more satisfactory results of the bibliographic survey.





NCBI Resources ▾ How To ▾ Sign in to NCBI

MeSH

MeSH

Limits Advanced

Search

Help

**MeSH**

MeSH (Medical Subject Headings) is the NLM controlled vocabulary thesaurus used for indexing articles for PubMed.

**Using MeSH**

[Help](#)

[Tutorials](#)

**More Resources**

[E-Utilities](#)

[NLM MeSH Homepage](#)

You are here: NCBI > Literature > MeSH Database

Support Center

|  |  |  |   |  |
|--|--|--|---|--|
| <b>GETTING STARTED</b><br><a href="#">NCBI Education</a><br><a href="#">NCBI Help Manual</a><br><a href="#">NCBI Handbook</a><br><a href="#">Training &amp; Tutorials</a><br><a href="#">Submit Data</a> | <b>RESOURCES</b><br><a href="#">Chemicals &amp; Bioassays</a><br><a href="#">Data &amp; Software</a><br><a href="#">DNA &amp; RNA</a><br><a href="#">Domains &amp; Structures</a><br><a href="#">Genes &amp; Expression</a><br><a href="#">Genetics &amp; Medicine</a><br><a href="#">Genomes &amp; Maps</a><br><a href="#">Homology</a><br><a href="#">Literature</a> | <b>POPULAR</b><br><a href="#">PubMed</a><br><a href="#">Bookshelf</a><br><a href="#">PubMed Central</a><br><a href="#">BLAST</a><br><a href="#">Nucleotide</a><br><a href="#">Genome</a><br><a href="#">SNP</a><br><a href="#">Gene</a><br><a href="#">Protein</a> | <b>FEATURED</b><br><a href="#">Genetic Testing Registry</a><br><a href="#">GenBank</a><br><a href="#">Reference Sequences</a><br><a href="#">Gene Expression Omnibus</a><br><a href="#">Genome Data Viewer</a><br><a href="#">Human Genome</a><br><a href="#">Mouse Genome</a><br><a href="#">Influenza Virus</a><br><a href="#">Primer-BLAST</a> | <b>NCBI INFORMATION</b><br><a href="#">About NCBI</a><br><a href="#">Research at NCBI</a><br><a href="#">NCBI News &amp; Blog</a><br><a href="#">NCBI FTP Site</a><br><a href="#">NCBI on Facebook</a><br><a href="#">NCBI on Twitter</a><br><a href="#">NCBI on YouTube</a><br><a href="#">Privacy Policy</a> |
|--|--|--|---|--|

# Mesh Terms

Medical Subject Headings or Mesh Terms are terminologies standardized by the scientific community to contribute to the definition of subjects and the retrieval of data on these subjects from the indexing of manuscripts in PubMed/ MEDLINE.

Mesh Terms are terms in English equivalent to the descriptors in health sciences (DECS) by the virtual health library (<http://decs.bvs.br>).

Searching for Mesh Terms is simple and equivalent to searching for articles, to demonstrate we will use the same example from the initial search topic and do a simple search for "bacterial infection".



NCBI Resources How To Sign in to NCBI

MeSH MeSH Search Limits Advanced Help

Full

**Bacterial Infections**

Infections by bacteria, general or unspecified.  
Year introduced: 1972

PubMed search builder options

[Subheadings:](#)

|  |  |  |
|--|--|--|
| <input type="checkbox"/> adverse effects       | <input type="checkbox"/> enzymology                      | <input type="checkbox"/> pharmacology                  |
| <input type="checkbox"/> analysis              | <input type="checkbox"/> epidemiology                    | <input type="checkbox"/> physiology                    |
| <input type="checkbox"/> anatomy and histology | <input type="checkbox"/> ethnology                       | <input type="checkbox"/> physiopathology               |
| <input type="checkbox"/> biosynthesis          | <input type="checkbox"/> etiology                        | <input type="checkbox"/> prevention and control        |
| <input type="checkbox"/> blood                 | <input type="checkbox"/> genetics                        | <input type="checkbox"/> psychology                    |
| <input type="checkbox"/> blood supply          | <input type="checkbox"/> growth and development          | <input type="checkbox"/> radiation effects             |
| <input type="checkbox"/> cerebrospinal fluid   | <input type="checkbox"/> history                         | <input type="checkbox"/> radiotherapy                  |
| <input type="checkbox"/> chemically induced    | <input type="checkbox"/> immunology                      | <input type="checkbox"/> rehabilitation                |
| <input type="checkbox"/> chemistry             | <input type="checkbox"/> injuries                        | <input type="checkbox"/> secondary                     |
| <input type="checkbox"/> classification        | <input type="checkbox"/> isolation and purification      | <input type="checkbox"/> statistics and numerical data |
| <input type="checkbox"/> complications         | <input type="checkbox"/> legislation and jurisprudence   | <input type="checkbox"/> surgery                       |
| <input type="checkbox"/> congenital            | <input type="checkbox"/> metabolism                      | <input type="checkbox"/> therapeutic use               |
| <input type="checkbox"/> diagnosis             | <input type="checkbox"/> microbiology                    | <input type="checkbox"/> therapy                       |
| <input type="checkbox"/> diagnostic imaging    | <input type="checkbox"/> mortality                       | <input type="checkbox"/> toxicity                      |
| <input type="checkbox"/> diet therapy          | <input type="checkbox"/> nursing                         | <input type="checkbox"/> transmission                  |
| <input type="checkbox"/> drug effects          | <input type="checkbox"/> organization and administration | <input type="checkbox"/> trends                        |
| <input type="checkbox"/> drug therapy          | <input type="checkbox"/> parasitology                    | <input type="checkbox"/> urine                         |
| <input type="checkbox"/> economics             | <input type="checkbox"/> pathogenicity                   | <input type="checkbox"/> veterinary                    |
| <input type="checkbox"/> education             | <input type="checkbox"/> pathology                       | <input type="checkbox"/> virology                      |
| <input type="checkbox"/> embryology            |  |  |

☐ Restrict to MeSH Major Topic.  
☐ Do not include MeSH terms found below this term in the MeSH hierarchy.

Tree Number(s): C01.150.252  
MeSH Unique ID: D001424  
Entry Terms:

- Infections, Bacterial
- Infection, Bacterial
- Bacterial Disease
- Bacterial Diseases
- Bacterial Infection

Previous Indexing:

- [Infection \(1966-1971\)](#)

[All MeSH Categories](#)  
[Diseases Category](#)  
[Infections](#)  
[Bacterial Infections and Mycoses](#)  
**Bacterial Infections**

Send to: PubMed Search Builder

Add to search builder AND Search PubMed

[YouTube Tutorial](#)

**Related Information**

[PubMed](#)  
[PubMed - Major Topic](#)  
[Clinical Queries](#)  
[NLM MeSH Browser](#)  
[dbGaP Links](#)  
[MedGen](#)

**Recent Activity**

[Turn Off](#) [Clear](#)

[Bacterial Infections](#) MeSH

[Detection of Trypanosoma cruzi by DNA amplification using the polymerase chain r...](#)

[Detection of the gubernacular canal and its attachment to the dental follicle ma...](#)

[Effect of micro-computed tomography reconstruction protocols on bone fractal](#)

[See more...](#)

Enter the keywords and the options with the best combinations will appear. However, if the desired Mesh Term is not returned, there are two reasons for this: the term is not a Mesh Term or the search is being done incorrectly.

To avoid disagreements, the platform will show Mesh Terms suggestions. In addition, one must be aware of the gender, number and degree of the keyword as these factors will influence the result.

Full ▾

Send to: ▾

## Bacterial Infections

Infections by bacteria, general or unspecified.  
Year introduced: 1972

PubMed search builder options

[Subheadings:](#)

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> adverse effects       | <input type="checkbox"/> enzymology                      | <input type="checkbox"/> statistics and numerical data |
| <input type="checkbox"/> analysis              | <input type="checkbox"/> epidermal                       | <input type="checkbox"/> surgery                       |
| <input type="checkbox"/> anatomy and histology | <input type="checkbox"/> ethnology                       | <input type="checkbox"/> therapeutic use               |
| <input type="checkbox"/> biosynthesis          | <input type="checkbox"/> etiologic factors               | <input type="checkbox"/> therapy                       |
| <input type="checkbox"/> blood                 | <input type="checkbox"/> genetics                        | <input type="checkbox"/> toxicity                      |
| <input type="checkbox"/> blood supply          | <input type="checkbox"/> growth and development          | <input type="checkbox"/> transmission                  |
| <input type="checkbox"/> cerebrospinal fluid   | <input type="checkbox"/> histology                       | <input type="checkbox"/> trends                        |
| <input type="checkbox"/> chemically induced    | <input type="checkbox"/> immunology                      | <input type="checkbox"/> urine                         |
| <input type="checkbox"/> chemistry             | <input type="checkbox"/> injuries                        | <input type="checkbox"/> veterinary                    |
| <input type="checkbox"/> classification        | <input type="checkbox"/> isolation and purification      | <input type="checkbox"/> virology                      |
| <input type="checkbox"/> complications         | <input type="checkbox"/> legislation and jurisprudence   |  |
| <input type="checkbox"/> congenital            | <input type="checkbox"/> metabolism                      |  |
| <input type="checkbox"/> diagnosis             | <input type="checkbox"/> microbiology                    |  |
| <input type="checkbox"/> diagnostic imaging    | <input type="checkbox"/> mortality                       |  |
| <input type="checkbox"/> diet therapy          | <input type="checkbox"/> nursing                         |  |
| <input type="checkbox"/> drug effects          | <input type="checkbox"/> organization and administration |  |
| <input type="checkbox"/> drug therapy          | <input type="checkbox"/> parasitology                    |  |
| <input type="checkbox"/> economics             | <input type="checkbox"/> pathogenicity                   |  |
| <input type="checkbox"/> education             | <input type="checkbox"/> pathology                       |  |
| <input type="checkbox"/> embryology            |  |  |

☐ Restrict to MeSH Major Topic.

☐ Do not include MeSH terms found below this term in the MeSH hierarchy.

Tree Number(s): C01.150.252

MeSH Unique ID: D001

Entry Terms:

- Infections, Bacterial
- Infection, Bacterial
- Bacterial Disease
- Bacterial Diseases
- Bacterial Infection

Previous Indexing:

- [Infection \(1966-1971\)](#)

[All MeSH Categories](#)

[Diseases Category](#)

[Infections](#)

[Bacterial Infections and Mycoses](#)

**Bacterial Infections**

[Bacteremia](#)

[Hemorrhagic Septicemia](#)

[Bacterial Zoonoses](#)

[Central Nervous System Bacterial Infections](#)

[Lyme Neuroborreliosis](#)

[Meningitis, Bacterial](#) +

[Neurosyphilis](#) +

[Tuberculosis, Central Nervous System](#) +

[Endocarditis, Bacterial](#)

[Endocarditis, Subacute Bacterial](#)

[Eye Infections, Bacterial](#)

[Conjunctivitis, Bacterial](#) +

[Hordeolum](#)

[Keratoconjunctivitis, Infectious](#)

[Tuberculosis, Ocular](#)

[Uveitis, Suppurative](#) +

[Fournier Gangrene](#)

[Gram-Negative Bacterial Infections](#)

[Aliivibrio Infections](#)

[Anaplasmatidae Infections](#) +

[Anaplasmosis](#)

[Bacteroidaceae Infections](#) +

[Bartonellaceae Infections](#) +

[Bordetella Infections](#) +

[Brucellosis](#) +

[Burkholderia Infections](#) +

[Campylobacter Infections](#)

[Chlamydiaceae Infections](#) +

[Cytophagaceae Infections](#)

[Desulfovibrionaceae Infections](#)

[Ehrlichiosis](#) +

To optimize the time while searching using "Mesh Terms", you can add them in this search box and continue the searches, without having to return to the PubMed homepage.

## PubMed Search Builder

Add to search builder

AND ▾

Search PubMed

[YouTube Tutorial](#)

## Related information

[PubMed](#)

[PubMed - Major Topic](#)

[Clinical Queries](#)

[NLM MeSH Browser](#)

[dbGaP Links](#)

[MedGen](#)

## Recent Activity

[Turn Off](#) [Clear](#)

[Bacterial Infections](#)

MeSH

[Detection of Trypanosoma cruzi by DNA amplification using the polymerase chain r...](#)

[Detection of the gubernacular canal and its attachment to the dental follicle ma...](#)

[Effect of micro-computed tomography reconstruction protocols on bone fractal](#)

[See more...](#)

# Boolean Operators

Boolean operators are words that have the objective of defining to the search database how the combination of search terms should be done.

Boolean operators are words that have the objective of defining to the search database how the combination of search terms should be done.

## Boolean Operators

**AND**  
+

The search results will contain an intersection of the selected words

Ex: bacterial infections AND immunocompetence

**OR**  
/

The search results will contain a sum of the selected words

Ex: bacterial infections OR immunocompetence

**AND NOT**  
-

The search results will contain an exclusion of the selected words

Ex: bacterial infections AND NOT immunocompetence

## Search Modifiers

**Quotation marks**  
"

The search results will contain the words selected from an exact phrase

Ex: "immunocompetence in bacterial infections"

**Asterisk**  
\*

Results will contain all words with the selected stem and suffixes

Ex: immunocompetence\*

**Parentheses**  
( )

The results will contain the order of operation established in a search with different operators

Ex: (immunocompetence AND humoral response) AND NOT bacterial infections

1

2

3



Source: shutterstock.com

---

## Advanced search

The advanced search option, when well built, becomes a very efficient article search and return feature. In this tutorial we will demonstrate two different advanced search techniques to improve results.

Advanced search link:

<https://www.ncbi.nlm.nih.gov/pubmed/advanced>

When accessing the above link, the search screen (**PubMed Advanced Search Builder**) will open and on the initial screen the user will be able to view text boxes, Boolean operators' field, **search fields**, its history and other functionalities as shown in next page.

PubMed Advanced Search Builder

2

Add terms to the query box

All Fields

1

Enter a search term

1

ADD

Show Index

Query box

Enter / edit your search query here

Search

History and Search Details

Your history is currently empty! As you use PubMed your recent searches will appear here.

- Affiliation
- ✓ All Fields
- Author
- Author - Corporate
- Author - First
- Author - Identifier
- Author - Last
- Book
- Conflict of Interest Statements
- Date - Completion
- Date - Create
- Date - Entry
- Date - MeSH
- Date - Modification
- Date - Publication
- EC/RN Number
- Editor
- Filter
- Grant Number
- ISBN
- Investigator
- Issue
- Journal
- Language
- Location ID
- MeSH Major Topic
- MeSH Subheading
- MeSH Terms
- Other Term
- Pagination
- Pharmacological Action
- Publication Type
- Publisher
- Secondary Source ID
- Subject - Personal Name
- Supplementary Concept
- Text Word
- Title
- Title/Abstract
- Transliterated Title
- Volume



Text boxes can be filled with your descriptors and/or search terms and/or keywords. When finished filling, press **ENTER** on the keyboard or **ADD** on the page, as seen in the following example.



Search fields are autoCompleting fields, which contain topics to help your search, such as: Mesh Terms; Title/Abstract and Authors. On the side we can see the various options presented by the PubMed platform.





## PubMed Advanced Search Builder

PubMed.gov

[User Guide](#)

Add terms to the query box

All Fields
Enter a search term

ADD

[Show Index](#)

Query box

Enter / edit your search query here

Search

## History and Search Details

Your history is currently empty! As you use PubMed your recent searches will appear here.



After pressing **ADD**, the search terms go to the **query box**, where you can check all the sets of the bibliographic research formed and change if necessary.

## PubMed Advanced Search Builder

PubMed.gov

[User Guide](#)

Add terms to the query box

All Fields
periodontal disease

ADD

Query box

Enter / edit your search query here

Add with AND

Add with OR

Add with NOT



When filling the text box automatically the boolean operator **AND**, if you want to use another operator in the search to choose, just click on the arrow next to the **ADD** and the options will appear.

## PubMed Advanced Search Builder

PubMed.gov

[User Guide](#)

Add terms to the query box

All Fields

non surgical treatment

AND

Show Index

5

Search

Add to History

Query box

periodontal disease

### History and Search Details

Your history is currently empty! As you use PubMed your recent searches will appear here.



To begin the bibliographic search, there are two search options. You can directly press the **SEARCH** button or the **ADD TO HISTORY** button, the **ADD TO HISTORY** button allows you to add the bibliographic search to the search history in the advanced search option, in addition to the possibility of including data from previous searches in the current search. This history will be automatically saved on the platform for a specific period of time.

## PubMed Advanced Search Builder

PubMed.gov

[User Guide](#)

Add terms to the query box

All Fields

Enter a search term

AND

Show Index

Query box

((periodontal treatment) AND (non surgical treatment)) AND (surgical treatment)

Search

### History and Search Details

Your history is currently empty! As you use PubMed your recent searches will appear here.



- ☐ Abstract
- ☐ Free full text
- ☐ Full text



1

Cite

Share

**Benefits of non-surgical periodontal treatment in patients with type 2 diabetes mellitus and chronic periodontitis: A randomized controlled trial.**

Mauri-Obradors E, Merlos A, Estrugo-Devesa A, Jané-Salas E, López-López J, Viñas M.

J Clin Periodontol. 2018 Mar;45(3):345-353. doi: 10.1111/jcpe.12858. Epub 2018 Jan 19.

PMID: 29265454 Clinical Trial.

OBJECTIVE: To evaluate the effect of **non-surgical periodontal treatment** on serum HbA1c (haemoglobin A1c or glycated haemoglobin) levels in patients with type 2 diabetes. ...These results were consistent with the bacteriological results in most but not ...



2

Cite

Share

**Periodontal disease and its impact on general health in Latin America. Section V: Treatment of periodontitis.**

Fischer RG, Lira Junior R, Retamal-Valdes B, Figueiredo LC, Malheiros Z, Stewart B, Feres M.

Braz Oral Res. 2020 Apr 9;34(suppl 1):e026. doi: 10.1590/1807-3107bor-2020.vol34.0026.

eCollection 2020.

# 1st topic search technique

To demonstrate the search using the 1st technique, we chose to search the topic "immune competence against bacterial infections for vaccination".

1st technique is simple and just fill the text boxes with the descriptors, as shown above. In this example we use the option "all fields" in "search fields", however in your search you can choose "Text Word", "Mesh Terms" or "Title/Abstract, as well as vary your booleans to obtain the most satisfactory results possible.

It is worth remembering that expanding the search too much or restricting it too much can be harmful, so it is recommended to do several searches in the literature to exhaust the results.



## PubMed Advanced Search Builder



[User Guide](#)

Add terms to the query box

All Fields  immune competence 

**ADD** 

[Show Index](#)

Query box

Enter / edit your search query here



**Search** 

## PubMed Advanced Search Builder



[User Guide](#)


Add terms to the query box

All Fields  bacterial infections 

**AND** 

[Show Index](#)

Query box

immune competence 



**Search** 

## PubMed Advanced Search Builder



[User Guide](#)


Add terms to the query box

All Fields  vaccination 

**AND** 

[Show Index](#)

Query box

(immune competence) AND (bacterial infections) 

**Search** 

## History and Search Details

Your history is currently empty! As you use PubMed your recent searches will appear here.

To reduce the results, you can select filters and refine your search according to the desired parameters, as in the example:

- 1- "Article Types: review";
- 2- "Free full text" free full articles;
- 3- "Publication date": 5 years.

Log in

((immune competence) AND (bacterial infections)) AND (vaccination)

Search

Create RSS

User Guide

Save

Email

Send to

Sorted by: Best match

Display options

MY NCBI FILTERS

2,937 results

of 294

RESULTS BY YEAR



1966

2021

TEXT AVAILABILITY

☐ Abstract

☐ Free full text

☐

Panel 8: Va

1

Cite

Share

Alderson MR, Murphy T, Peltan SI, Novotny EA, Hammitt LL, Kurabi A, Li JD, Thornton RB, Kirkham LS.

Int J Pediatr Otorhinolaryngol. 2020 Mar;130 Suppl 1(Suppl 1):109839. doi: 10.1016/j.ijporl.2019.109839. Epub 2019 Dec 18.

PMID: 31948716 [Free PMC article](#). [Review](#).

Research into alternative **vaccine** delivery strategies has demonstrated the power of maternal and mucosal **vaccination** for OM prevention. ...Understanding population differences in natural and **vaccine**-induced **immune** responses to otopathogens is also impo ...

☐

BCG Vaccination Induces Long-Term Functional Reprogramming of Human Neutrophils.

**NIH** National Library of Medicine  
National Center for Biotechnology Information

Log in

PubMed.gov

((immune competence) AND (bacterial infections)) AND (vaccination)

Search

Advanced Create alert Create RSS

User Guide

Save

Email

Send to

Sorted by: Best match

Display options

MY NCBI FILTERS

93 results

1

of 10

RESULTS BY YEAR



2016 2021

TEXT AVAILABILITY

☐ Abstract

☒ Free full text

Filters applied: Free full text

☐

Syphilis.

1

Peeling RW, Mabey D, Kamb ML, Chen XS, Radolf JD, Benzaken AS.

Cite

Nat Rev Dis Primers. 2017 Oct 12;3:17073. doi: 10.1038/nrdp.2017.73.

PMID: 29022569 [Free PMC article](#). [Review](#).

Share

Treponema pallidum subspecies pallidum (T. pallidum) causes syphilis via sexual exposure or via vertical transmission during pregnancy. T. pallidum is renowned for its invasiveness and **immune**-evasiveness; its clinical manifestations result from local inflammatory responses ...

☐

Exacerbations of COPD.

2

Viniol C, Vogelmeier CF.

After selecting the filters your search has the desired result.

Add terms to the query box

All Fields

Enter a search term



ADD

[Show Index](#)

Query box

Enter / edit your search query here

Add to History

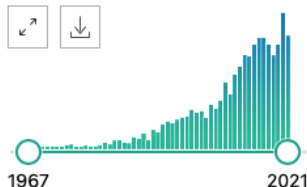
History and Search ails
 Download  Delete  
 Download a CSV file of your History and Search Details

| Search | Actions | Details | Query  | Results | Time     |
|--------|---------|---------|--|---------|----------|
| #1     | ...     | ▼       | Search: ((immune competence) AND (bacterial infections)) AND (vaccination)<br>("immune"[All Fields] OR "immuned"[All Fields] OR "immunes"[All Fields] OR "immunisation"[All Fields] OR "vaccination"[MeSH Terms] OR "vaccination"[All Fields] OR "immunization"[All Fields] OR | 2,937   | 19:43:37 |



When we select the advanced search option, we verify the addition of the “Details” option, which when we click on the arrow, the search blocks with the search terms will appear.

In these blocks the terms will be combined between Boolean operators, search modifiers, keywords, "Mesh Terms" and "All fields terms" automatically by the platform and the user can choose to copy and paste the search blocks and organize their advanced search in a more practice.



- ☐ Abstract
- ☐ Free full text
- ☐ Full text



**Benefits of non-surgical periodontal treatment in patients with type 2 diabetes mellitus and chronic periodontitis: A randomized controlled trial.**

1

Cite

Mauri-Obradors E, Merlos A, Estrugo-Devesa A, Jané-Salas E, López-López J, Viñas M. J Clin Periodontol. 2018 Mar;45(3):345-353. doi: 10.1111/jcpe.12858. Epub 2018 Jan 19.

Share

PMID: 29265454 Clinical Trial.

OBJECTIVE: To evaluate the effect of **non-surgical periodontal treatment** on serum HbA1c (haemoglobin A1c or glycated haemoglobin) levels in patients with type 2 diabetes. ...These results were consistent with the bacteriological results in most but not ...



**Periodontal disease and its impact on general health in Latin America. Section V: Treatment of periodontitis.**

2

Cite

Fischer RG, Lira Junior R, Retamal-Valdes B, Figueiredo LC, Malheiros Z, Stewart B, Feres M. Braz Oral Res. 2020 Apr 9;34(suppl 1):e026. doi: 10.1590/1807-3107bor-2020.vol34.0026.

Share

eCollection 2020.

## 2nd topic search technique

The 2nd technique consists of filling the text boxes of the advanced search with several options of keywords and/or descriptors previously chosen, selecting in the "search fields" the option "Mesh Terms" and to form the most specific search block, if you select the Boolean term "OR" among the synonyms of a descriptor and between different descriptors, choose the Boolean terms "AND" to associate the search terms and "AND NOT" to exclude any term.

Next, as an example, we will use the search block "periodontal diseases" OR "chronic periodontitis" AND "surgical treatment" AND "non-surgical treatment" OR "root scaling and planning" with review articles and applying the search filters in this second search. by theme.

## PubMed Advanced Search Builder



[User Guide](#)

Add terms to the query box

All Fields



periodontal disease



ADD



[Show Index](#)

Query box

Enter / edit your search query here

Search



## PubMed Advanced Search Builder



[User Guide](#)

Add terms to the query box

All Fields



surgical treatment



AND



[Show Index](#)

Query box

periodontal disease



Search



## PubMed Advanced Search Builder



[User Guide](#)

Add terms to the query box

All Fields



non surgical treatment



AND



[Show Index](#)

Query box

(periodontal disease) AND (surgical treatment)



Search





2,877 results

Total result of manuscripts using the 1st technique without adding search filters.

of 288



Smoking c

1

Alexandridi F, Tsamiridis G, Sponcerer

Cite

Aust Dent J. 2018 Jun;63(2):140-149. doi: 10.1111/adj.12568. Epub 2017 Oct 24.

PMID: 28921548

Free article.

Review.

Share

The aim of this study was to review the literature related to the impact of smoking cessation on periodontal health, periodontal disease and periodontal treatment outcome as well as to review the smoking cessation strategies and the dentist's ro ...

It is observed that the results without filters and with the initial search technique are 2,877 articles for reading. Then we will use the second search technique with the following filters: 5 years for publication date; review articles; full text available free of charge and in English, which resulted in a reduction to 8 articles available.

Add terms to the query box

MeSH Terms



periodontal diseases



ADD



Show Index

Query box

Enter / edit your search query here

Search



## PubMed Advanced Search Builder



[User Guide](#)

Add terms to the query box

MeSH Terms



chronic periodontitis



OR



[Show Index](#)

Query box

periodontal diseases[MeSH Terms]



Search



## PubMed Advanced Search Builder



[User Guide](#)

Add terms to the query box

MeSH Terms



surgical treatment



OR



Add with AND

Add with OR

Add with NOT

Query box

(periodontal diseases[MeSH Terms]) OR (chronic periodontitis[MeSH Terms])



## PubMed Advanced Search Builder



[User Guide](#)

Add terms to the query box

MeSH Terms



non surgical treatment



AND



[Show Index](#)

Query box

(((((periodontal diseases[MeSH Terms]) OR (chronic periodontitis[MeSH Terms])) AND (surgical treatment[MeSH Terms]))



Search



## PubMed Advanced Search Builder

Add terms to the query box

MeSH Terms

root scaling and planing

AND

Add with AND  
Add with OR  
Add with NOT

Query box

((((periodontal diseases[MeSH Terms]) OR (chronic periodontitis[MeSH Terms])) AND (surgical treatment[MeSH Terms])) ) AND (non surgical treatment[MeSH Terms])

Enter / edit your search query here

Add to History

The following term was ignored: (

The following term was not found in PubMed: planing

## History and Search Details

Download Delete

| Search | Actions | Details | Query  | Results | Time     |
|--------|---------|---------|--|---------|----------|
| #1     | ...     | !       | Search: ((((((periodontal diseases[MeSH Terms]) OR (chronic periodontitis[MeSH Terms])) AND (surgical treatment[MeSH Terms])) ) AND (non surgical treatment[MeSH Terms])) OR (root scaling and planing[MeSH Terms])) | 1,418   | 21:05:15 |

Showing 1 to 1 of 1 entries

gical treatment[MeSH Terms])) OR (root scaling and planing[MeSH Terms]) Search

Advanced Create alert Create RSS

User Guide

Save

Email

Send to

Sorted by: Best match

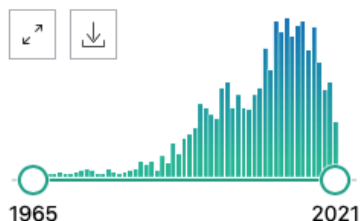
Display options

MY NCBI FILTERS

1,418 results

Page 1 of 142

RESULTS BY YEAR



TEXT AVAILABILITY

The following term was ignored: (

The following term was not found in PubMed: planing

☐ 1 Laser therapy for treatment of peri-implant mucositis and peri-implantitis: An American Academy of Periodontology best evidence review.

Cite Lin GH, Suárez López Del Amo F, Wang HL.  
J Periodontol. 2018 Jul;89(7):766-782. doi: 10.1902/jop.2017.160483.

Share PMID: 30133748 Free article.



Save

Email

Send to

Sorted by: Best match

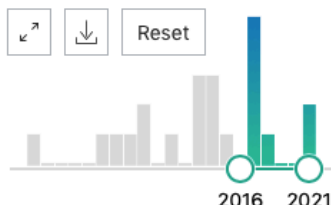
Display options ⚙

MY NCBI FILTERS

8 results

Page 1 of 1

RESULTS BY YEAR



Filters applied: Free full text, Review. [Clear all](#)

The following term was ignored: (

The following term was not found in PubMed: planing

1

**Soft tissue substitutes in non-root coverage procedures: a systematic review and meta-analysis.**

Cite

Bertl K, Melchard M, Pandis N, Müller-Kern M, Stavropoulos A.

Share

Clin Oral Investig. 2017 Mar;21(2):505-518. doi: 10.1007/s00784-016-2044-4. Epub 2017 Jan 20.

PMID: 28108833 [Free PMC article.](#) [Review.](#)

OBJECTIVES: The present systematic review compared the effectiveness of soft tissue substitutes (STSS) and autogenous free gingival grafts (FGGs) in non-root-coverage procedures to increase keratinized tissue (KT) width around teeth. MATERIALS AND METHODS: Included studies ...

TEXT AVAILABILITY

☐ Abstract

☒ Free full text

☐ Full text

Search

Advanced

PubMed® comprises more than 33 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full text content from PubMed Central and publisher web sites.

---

## Search by authors

Another method of searching for articles is through the use of authors and/or date of publication. This feature can be used in scenarios such as lectures, where there is an explanation of articles and, often, the reader has access only to the author and the year of publication. In this chapter, we'll show you how to search, find, and download any article using this method.

In these cases, we recommend adapting advanced search techniques by topic for greater effectiveness in the results obtained. For example, in the case of the author/research date, “Fonseca et al. 2018” just fill in the text boxes as shown below.

You can use the topic addressed by the teacher or speaker, such as cytomegalovirus (cytomegalovirus) and periodontitis (periodontitis) to improve the chances of results.

## PubMed Advanced Search Builder



[User Guide](#)

Add terms to the query box

Author ⬆ ⬆ Fonseca ✕

ADD ⬇

[Show Index](#)

Query box

Enter / edit your search query here

Search ⬇

## PubMed Advanced Search Builder



[User Guide](#)

Add terms to the query box

Date - Publication ⬆ 2018 to 2018

AND ⬇

Query box

Fonseca[Author] ✕

Search ⬇

## PubMed Advanced Search Builder



[User Guide](#)

Add terms to the query box

MeSH Terms ⬆ cytomegalovirus ✕

AND ⬇

[Show Index](#)

Query box

((Fonseca[Author]) AND (("2018"[Date - Publication] : "2018"[Date - Publication]))) ✕

Search ⬇

Add terms to the query box

MeSH Terms

Enter a search term

ADD

Show Index

Query box

Enter / edit your search query here

Add to History

History and Search Details

Download Delete

| Search | Actions | Details | Query   | Results | Time     |
|--------|---------|---------|---|---------|----------|
| #1     | ...     | >       | Search: (((Fonseca[Author]) AND ("2018"[Date - Publication] : "2018"[Date - Publication]))) AND (cytomegalovirus[MeSH Terms]) | 4       | 22:57:27 |

TEXT AVAILABILITY

- ☐ Abstract
- ☐ Free full text
- ☐ Full text

ARTICLE ATTRIBUTE

- ☐ Associated data

ARTICLE TYPE

- ☐ Books and Documents
- ☐ Case Reports
- ☐ Clinical Trial
- ☐ Meta-Analysis
- ☐ Randomized Controlled Trial
- ☐ Review
- ☐ Systematic Review

PUBLICATION DATE

- ☐ 1 year
- ☐ 5 years

☐

1

Cite

Share

**Congenital Cytomegalovirus and HIV Perinatal Transmission.**  
Adachi K, Xu J, Ank B, Watts DH, Camarca M, Mofenson LM, Pilotto JH, Joao E, Gray G, Theron G, Santos B, **Fonseca R**, Kreitchmann R, Pinto J, Mussi-Pinhata MM, Machado DM, Ceriotto M, Morgado MG, Bryson YJ, Veloso VG, Grinsztejn B, Mirochnick M, Moya J, Nielsen-Saines K; MPH for the NICHD HPTN 040 Study Team.  
Pediatr Infect Dis J. 2018 Oct;37(10):1016-1021. doi: 10.1097/INF.0000000000001975.  
PMID: 30216294 **Free PMC article.** Clinical Trial.

☐

2

Cite

Share

**Human Herpesvirus 8 in Perinatally HIV-infected Children with Interstitial Lung Disease.**  
Scotta MC, Fabro AT, Machado PRL, Ramos SG, Cervi MC, **da Fonseca BAL**, Motta F, Negrini BVM.  
J Trop Pediatr. 2018 Oct 1;64(5):382-388. doi: 10.1093/tropej/fmx080.  
PMID: 29165615

☐

3

Cite

Share

**Absence of cytomegalovirus in gingivitis and chronic periodontitis in HIV-1 patients in Northern Brazil.**  
**Fonseca RRS**, Alves ACBA, Amanajás TA, Nogueira BML, Menezes TOA, Siravenha LQ, Pereira DLA, Machado LFA, Gilet LCDS, Menezes SAF.  
Rev Soc Bras Med Trop. 2018 Nov-Dec;51(6):809-812. doi: 10.1590/0037-8682-0080-2018.  
PMID: 30517535 **Free article.**

☐

4

Cite

**Multimodal Imaging of Cytomegalovirus-associated Frosted Branch Angiitis.**  
Rodrigues TM, Marques JP, **Fonseca C**.  
Ophthalmol Retina. 2018 Jan;2(1):37. doi: 10.1016/j.oret.2017.09.009. Epub 2018 Jan 3.  
PMID: 31047299 No abstract available.

## Short Communication

# Absence of cytomegalovirus in gingivitis and chronic periodontitis in HIV-1 patients in Northern Brazil

**Ricardo Roberto de Souza Fonseca<sup>[1]</sup>, Ana Cláudia Braga Amoras Alves<sup>[2]</sup>,  
Thalita de Almeida Amanajás<sup>[2]</sup>, Brenna Magdalena Lima Nogueira<sup>[3]</sup>,  
Tatiany Oliveira de Alencar Menezes<sup>[4]</sup>, Leonardo Quintão Siravenha<sup>[5]</sup>,  
Danilo Leôncio Aguiar Pereira<sup>[5]</sup>, Luiz Fernando Almeida Machado<sup>[5]</sup>,  
Luciana Campêlo da Silva Gilet<sup>[6]</sup> and Sílvia Augusto Fernandes de Menezes<sup>[1]</sup>**

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[5]. Departamento Ciências Biológicas, Laboratório de Virologia, Universidade Federal do Pará, Belém, PA, Brasil.

[6]. Departamento de Odontologia, Centro Especializado de Referência de Doenças Infecciosas e Parasitárias, Universidade Federal do Pará, Belém, PA, Brasil.

## Abstract

**Introduction:** The influence of cytomegalovirus (CMV) on the progression of chronic periodontitis in HIV patients is poorly investigated. **Methods:** ELISA was used for anti-CMV antibody IgG titer measurements and real-time polymerase chain reaction for qualitative and quantitative CMV detection. Data on the CD4<sup>+</sup> T lymphocyte count and plasma HIV viral load were obtained from patient records. **Results:** CMV DNA was detected in samples of subgingival biofilm in only three individuals, two of them with chronic periodontitis (4%) and one with gingivitis (3.3%). **Conclusions:** The prevalence of CMV is very low both in HIV-1 patients with gingivitis and chronic periodontitis.

**Keywords:** HIV. Cytomegalovirus. Periodontal disease.

Human immunodeficiency virus (HIV) infection is characterized by an advanced state of immunosuppression. HIV infects TCD4<sup>+</sup> lymphocytes (LTCD4<sup>+</sup>), also known as T helper lymphocytes (LTh) and the decrease in the number of these cells may contribute to the occurrence of several opportunistic infections and several pathologies. Periodontitis is recognized as an important condition and may be associated with the immunodeficiency caused by HIV. It can also be considered one of the first clinical signs of HIV infection, which can be mitigated by the use of antiretroviral therapy (ART)<sup>1-3</sup>.

When chronic periodontitis (CP) occurs in HIV negative patients, the periodontal connective tissue demonstrates a dense inflammatory infiltrate of mononuclear cells, lymphocytes, and macrophages. In addition to the pro-inflammatory and osteoclast cells, recent studies have evidenced an interaction between periodontopathogenic bacteria and CMV, this interaction

contributes to severe bone destruction and it is a direct result of the processes of herpesvirus activity and latency<sup>4-6</sup>.

In HIV positive patients, herpesvirus reactivation and viral activity frequently occur due to the immunosuppression of antiviral immune cells such as natural killer cells, lymphocytes, macrophages, and interferons caused by HIV-1. Thus, HIV positive patients with active herpesvirus infection present periodontal disease with greater probing depth, spontaneous bleeding and severe loss of the clinical attachment level (CAL)<sup>7-8</sup>. Due to the deficient immune system and secondary infection with herpesvirus, these patients present a more aggressive periodontal disease being recurrent advanced stages of the disease such as necrotizing ulcerative periodontitis or gingivitis<sup>9</sup>.

In the Amazon region, CMV is one of the most prevalent herpesviruses in the HIV positive population due to the environmental and socioeconomic conditions of the northern Brazilian region<sup>9</sup>. It is known that CMV activity in the periodontal pocket leads to a more rapid progression of CP. In addition, studies indicate that CMV is the most prevalent herpesvirus in the gingival tissue in HIV-positive patients. With the advent of ART therapy, seropositive patients achieve a reduction in HIV viral load and elevated lymphocyte levels,

Corresponding author: Sílvia Augusto Fernandes de Menezes.

e-mail: menezesperio@gmail.com

Received 28 February 2018

Accepted 15 May 2018





Save

Email

Send to

Sorted by: Best match

Display options ⚙

MY NCBI FILTERS

4 results

<< < Page 1 of 1 > >>

TEXT AVAILABILITY

- ☐ Abstract
- ☐ Free full text
- ☐ Full text

ARTICLE ATTRIBUTE



### Congenital Cytomegalovirus and HIV Perinatal Transmission.

1

Cite

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Adachi K, Xu J, Ank B, Watts DH, Camarca M, Mofenson LM, Pilotto JH, Joao E, Gray G, Theron G, Santos B, **Fonseca R**, Kreitchmann R, Pinto J, Mussi-Pinhata MM, Machado DM, Ceriotto M, Morgado MG, Bryson YJ, Veloso VG, Grinsztejn B, Mirochnick M, Moya J, Nielsen-Saines K; MPH for the NICHD HPTN 040 Study Team.

*Pediatr Infect Dis J.* 2018 Oct;37(10):1016-1021. doi: 10.1097/INF.0000000000001975.

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