



Mahidol University
Faculty of Science

Stang Mongkolsuk Library
and Information Division

Stang Library Training

EndNote 2025

A dark grey rounded square with a thin white border, containing the white letters "EN" in a bold, sans-serif font.

EN



9 July 2025



1:00 PM - 3:00 PM



Google Meet

Kanokporn Ngamsawangrungrat, Librarian
Stang Mongkolsuk Library & Information Division

Introduction

- **What is EndNote?**
- **How EndNote works**
- **Compatibility and System Requirements**
- **Download Endnote Software**

What is EndNote?

Reference management software

- Developed by **Clarivate Analytics**

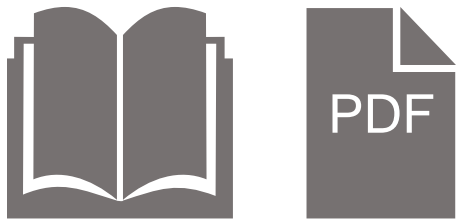
Personal Reference database

- Storing, managing, and searching for bibliographic references in your private reference library

Bibliography and manuscript maker

- Formats citations in Microsoft Word with the **Cite While You Write™** feature

How EndNote Works



Books,
Journals,
Research Articles,
E-database,
etc.



Create bibliography



Manuscript,
Thesis,
Report,
etc.

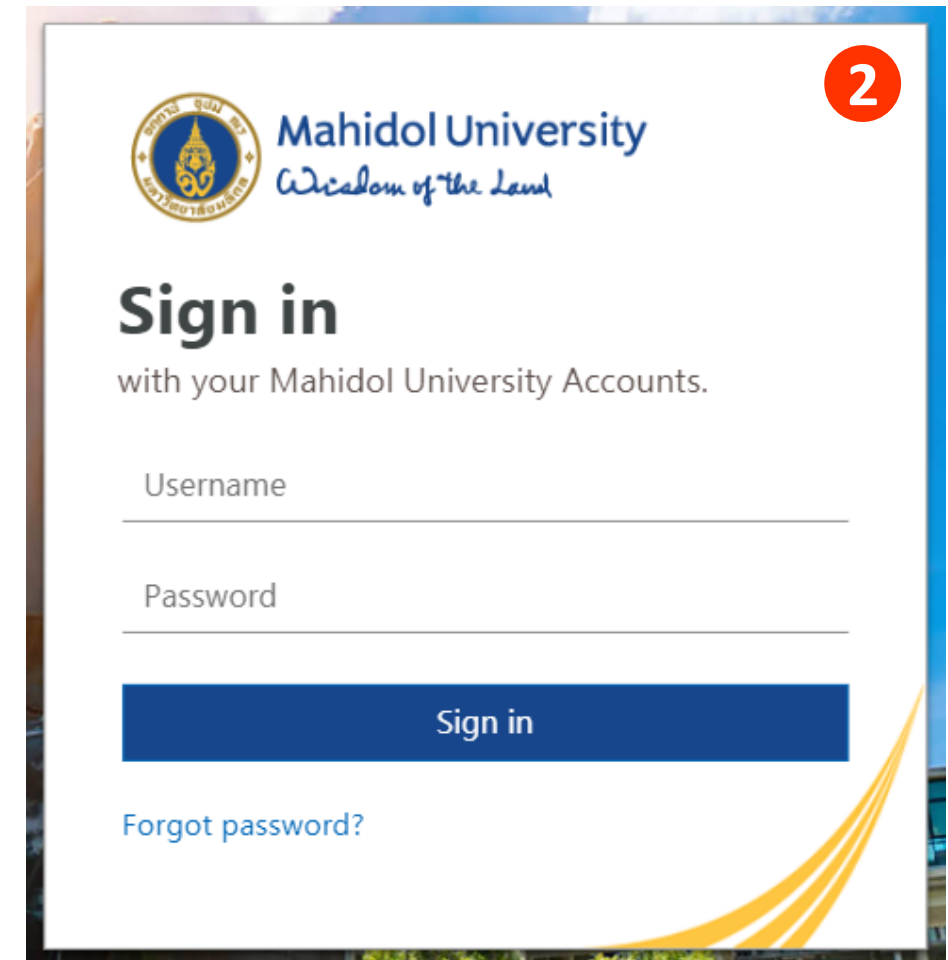
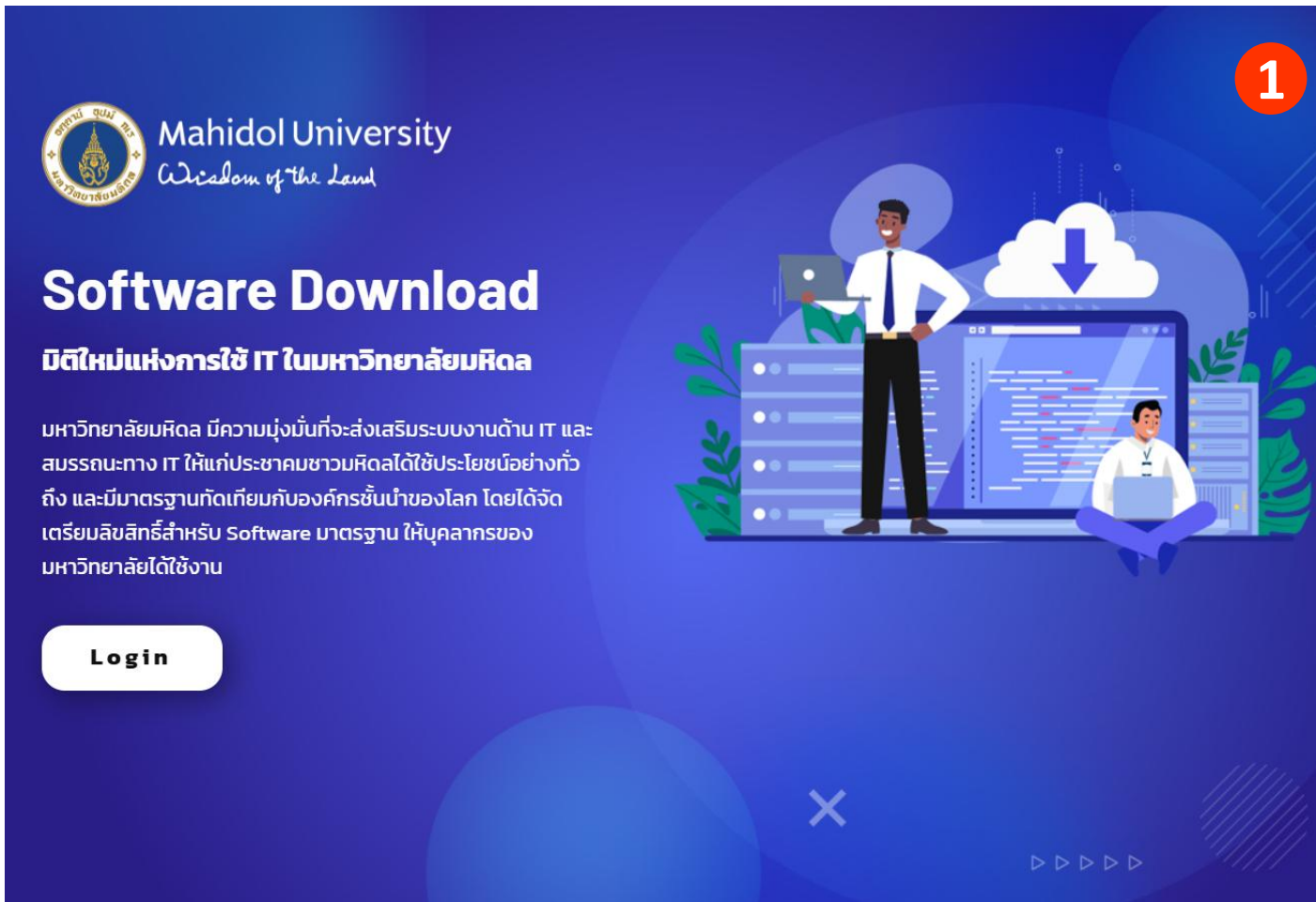
Compatibility and System Requirements

Operating System	Version	Word processor software
Windows	<ul style="list-style-type: none">• Windows 10• Windows 11	Microsoft Word [CWYW] : <ul style="list-style-type: none">• 2016• 2019• 2021• 2024• Office 365 (desktop version only)
Macintosh	<ul style="list-style-type: none">• macOS 10.14• macOS 10.15• macOS 11• macOS 12• macOS 13• macOS 14• macOS 15	Microsoft Word [CWYW] : <ul style="list-style-type: none">• 2016• 2019• 2021• 2024• Office 365 (desktop version only)

Source: <https://endnote.com/product-details/compatibility>

Downloading EndNote Software (1)

1. Go to <https://softwaredownload.mahidol.ac.th/> (Access through MU-WiFi or VPN).
2. Login with the **MU Internet account**.

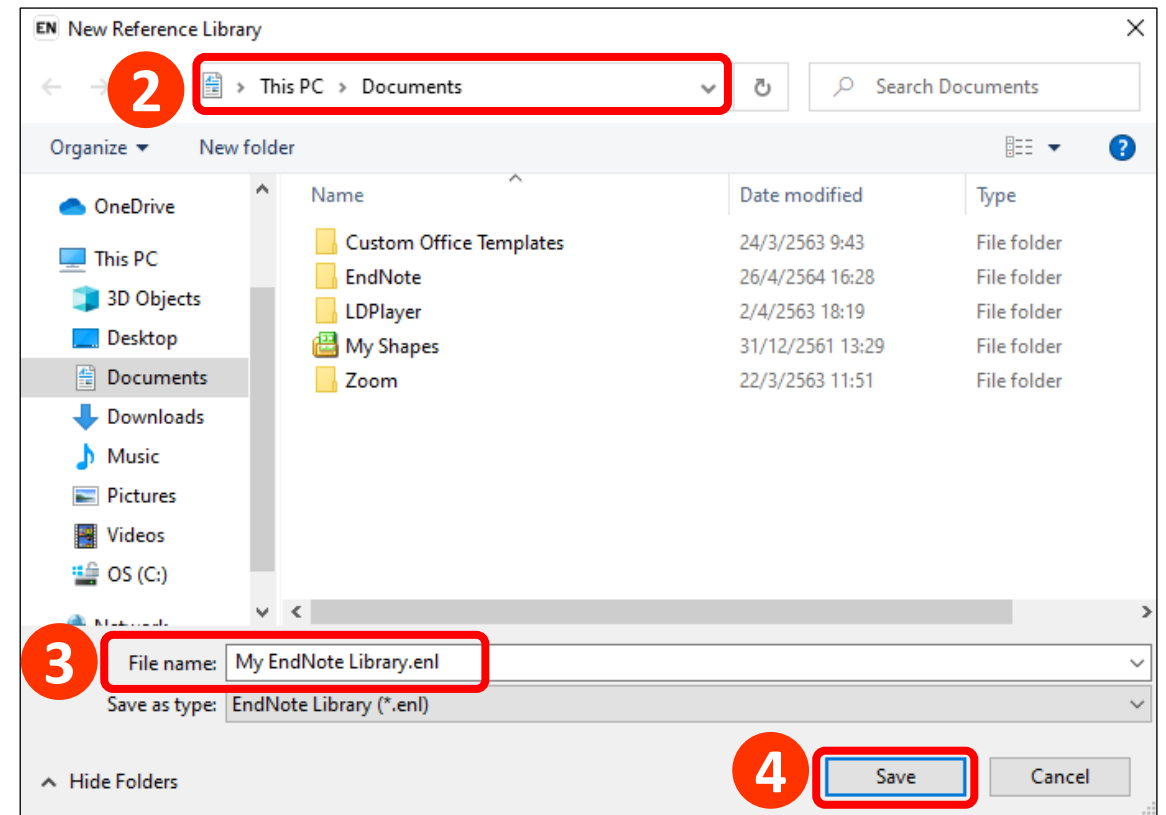
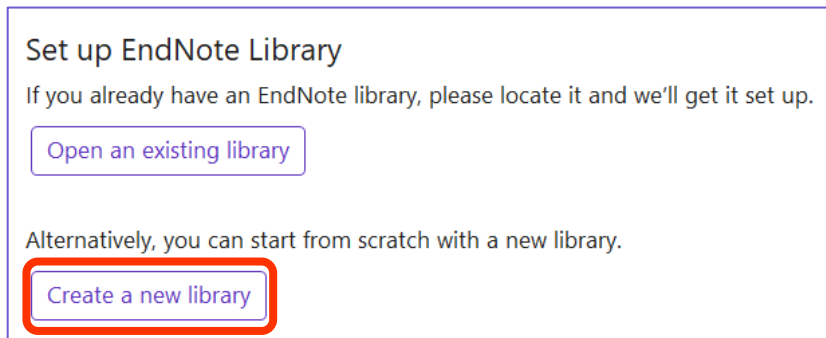
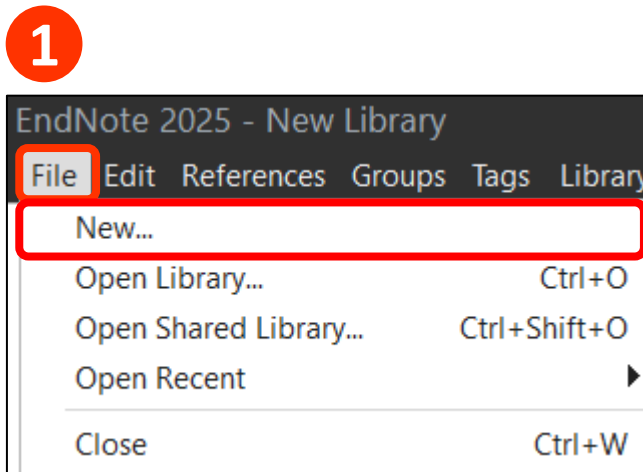


Get Started with EndNote

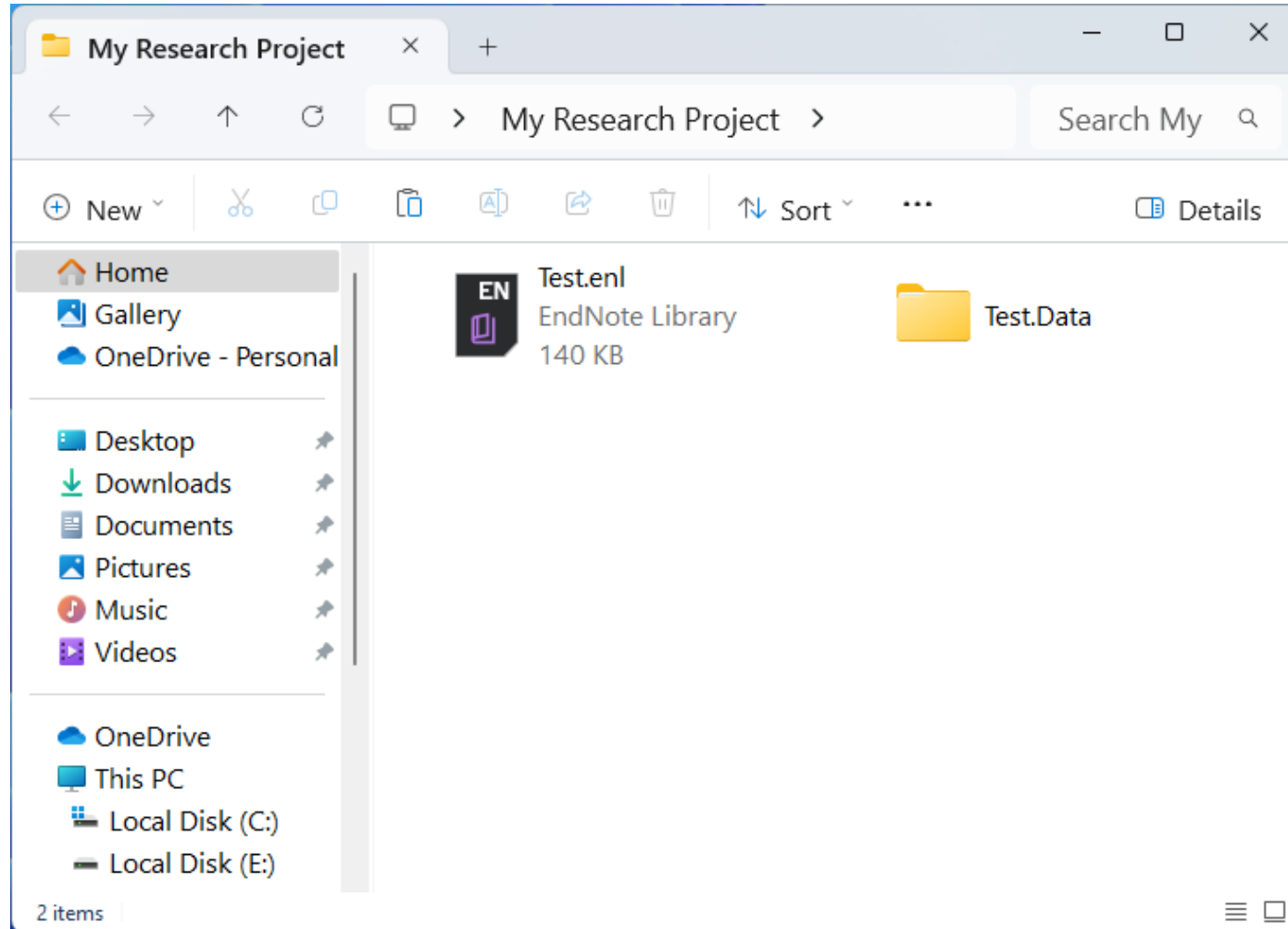
- **Creating a New Library**
- **EndNote Library Components**
- **Library Overview**
- **Journal Term Lists**

Creating a New Library

1. Go to **File > New...** or select **Creating a New Library** from the Setup Endnote Library box.
2. EndNote presents a dialog prompting you to select the location where you will save the library.
3. Enter a name for your new library. It is recommended to name it specific.
4. Click **Save**, then the new Endnote library appears as an empty library.



EndNote Library Components



- EndNote libraries are made up of two parts:
 - **EndNote Library file (*.enl)**
 - **Data folder (*.Data)**These two parts must be kept together to work correctly.
- Keep EndNote libraries on your computer's local hard drive.
- EndNote libraries should not be stored in cloud-syncing folders such as Google Drive, OneDrive, etc., as cloud-syncing folders can damage EndNote libraries.

Blank EndNote Library

EndNote 2025 - Test.enl

File Edit References Groups Tags Library Tools Window Help

Library Status

All References

Recently Added

Unfiled

Trash

MY GROUPS

My Groups

MY TAGS

FIND FULL TEXT

GROUPS SHARED B...

ONLINE SEARCH

Library of Congress

PubMed (NLM)

Web of Science Cor...

Search for group

All References

Advanced search

All References

0 References

Author

Year

Title

Journal

Last Updated

No reference selected

Library Overview

Menu Bar

Groups panel

shows you both default groups and groups or group sets you create for your research projects.

Search panel to find an item in your library or to query a remote database for new references to capture.

Tab panel

The Summary tab displays a detailed overview of a selected reference. Quickly alter reference metadata from the Edit tab.

EndNote 2025 - Sample Library 2025.enl

File Edit References Groups Tags Library Tools Window Help

Library Status

- All References 190
- Recently Added
- Unfiled 1
- Trash 2
- MY GROUPS**
- Avian Intelligence
 - Avian Cognition 33
 - Corvids 24
 - Corvids & Parrots 6
 - Parrots 28
- Bats
 - Chiroptera 27
 - Echolocation 10
 - Echolocation OR Sonar 13
 - Sonar 8
- My Groups
 - Citation Report Example 122
 - Cognition-All 86
 - Open Access Articles 14
 - References to Update 2
- MY TAGS**
- Contact Author 2
- Need Abstract 30
- Need to Buy 7
- Reading: High Priority 3
- Reading: Suggested 3

Search for group

All References

190 References

Author	Year	Title	Journal	Last Updat...	Reference Type
	2009	Leaf-nosed bat	Encyclopædia ...	27/02/2025	Encyclopedia
Aguilera-Alcal...	2020	Role of scavengers in...	Ecological Ind...	27/02/2025	Journal Article
Aizpurua, O.; ...	2016	Fishing Technique of ...	Plos One	27/02/2025	Journal Article
Allen, Glover M.	2004	Bats: biology, behavior...		27/02/2025	Book
Arnett, E. B.; He...	2013	Evaluating the Effectiv...	PLoS One	27/02/2025	Journal Article
Avila-Flores, R.; ...	2004	Ecological, taxonomic,...	Journal of Ma...	27/02/2025	Journal Article
Bat Conservati...	2008	Bat Conservation Inter...		27/02/2025	Web Page
Binfield, Peter	2008	At PLoS ONE we're ba...	PLoS: Public Li...	27/02/2025	Blog
Bird, C. D.; Eme...	2009	Insightful problem sol...	Proceedings of ...	27/02/2025	Journal Article
Blanco, G.; Cu...	2019	A shot in the dark: S...	Journal for Na...	27/02/2025	Journal Article
Brinklov, S.; Kal...	2009	Intense echolocation c...	Journal of Expe...	27/02/2025	Journal Article
Brucks, D.; vo...	2020	Parrots Voluntarily ...	Curr Biol	27/02/2025	Journal Article
Bundell, S.	2020	The parrots that u...	Nature	27/02/2025	Journal Article
Chiu, C.; Moss, ...	2007	The role of the extern...	J Acoust Soc Am	27/02/2025	Journal Article

Acquisition of the Same Different Concept by an African Gray Parrot (Psittacus erithacus): Learning with Respect to Categories of Color, Shape, and Material

Pepperberg, I.M.

Animal Learning & Behavior

1987

Vancouver Insert Copy

1. Pepperberg IM. Acquisition of the Same Different Concept by an African Gray Parrot (Psittacus erithacus): Learning with Respect to Categories of Color, Shape, and Material. Anim Learn Behav. 1987;15(4):423–32.

Reference List panel shows you the individual references stored in your EndNote library, also known as library records.

Preview panel shows you how a reference would appear formatted with a specific output style.

Journal Term Lists (1)

Journal Term Lists are lists of journal names in full and abbreviated form.

- These lists are used for making correct journal names in reference format.
- Help EndNote work correctly to find out the duplicate references.

Recently Added 2 References			
Author	Year	Title	Journal
Li, Zhuo; Hirst, Jonathan D.	2020	Computed optical spectra of SARS-CoV-2 proteins	Chemical Physics Letters
Li, Z.; Hirst, J. D.	2020	Computed optical spectra of SARS-CoV-2 proteins	Chem Phys Lett

*ScienceDirect**
give full journal name

*PubMed**
give abbreviated journal name

**Retrieving references from various sources may give the journal names in a different form.*

Journal Term Lists (2)

Before defining Journal Term List



ScienceDirect

Give full journal name

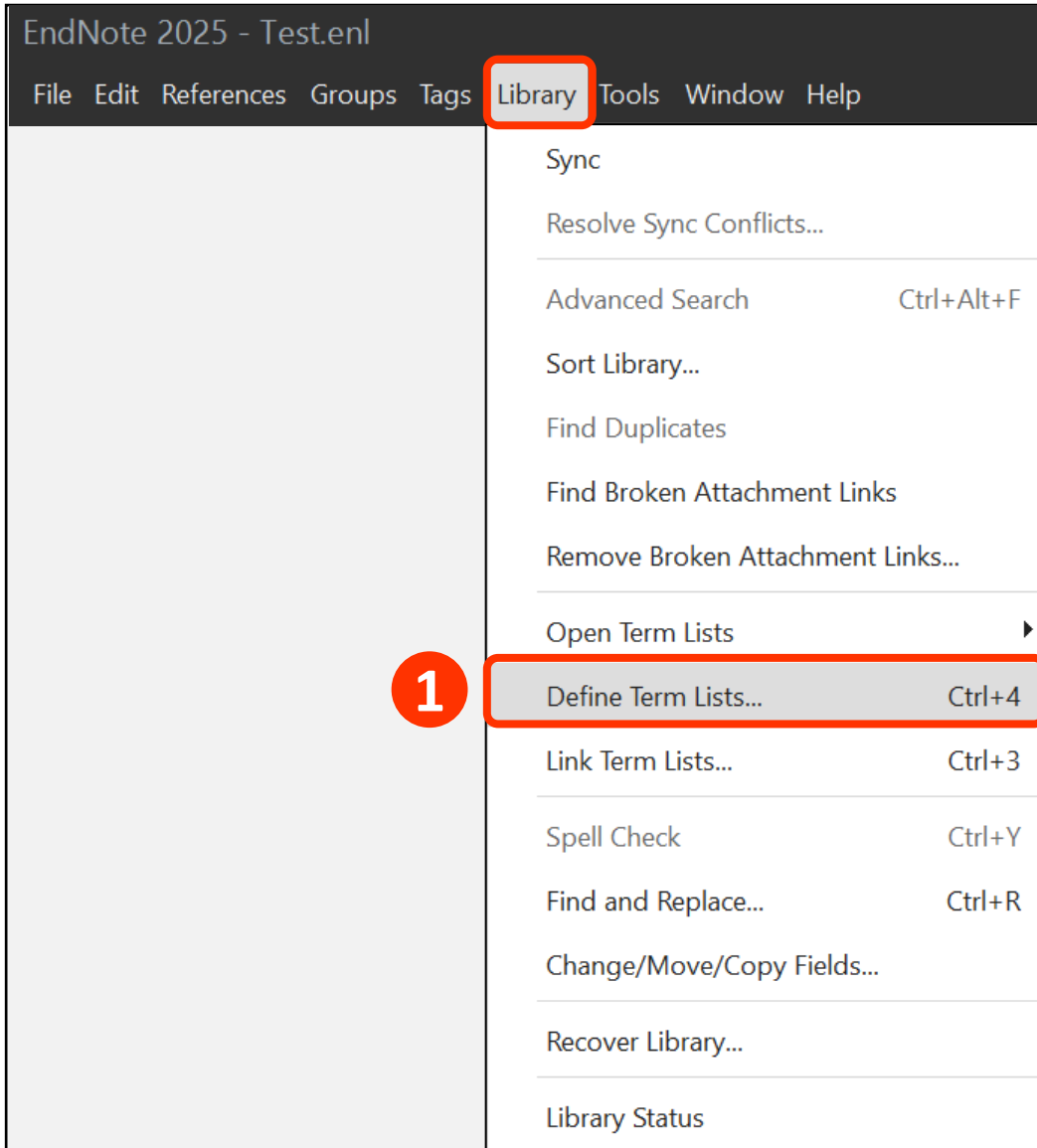
Vancouver ▾	Insert	Copy ▾
1. Li Z, Hirst JD. Computed optical spectra of SARS-CoV-2 proteins. Chemical Physics Letters. 2020;758:137935.		

After defining Journal Term List

Vancouver ▾	Insert	Copy ▾
1. Li Z, Hirst JD. Computed optical spectra of SARS-CoV-2 proteins. Chem Phys Lett. 2020;758:137935.		

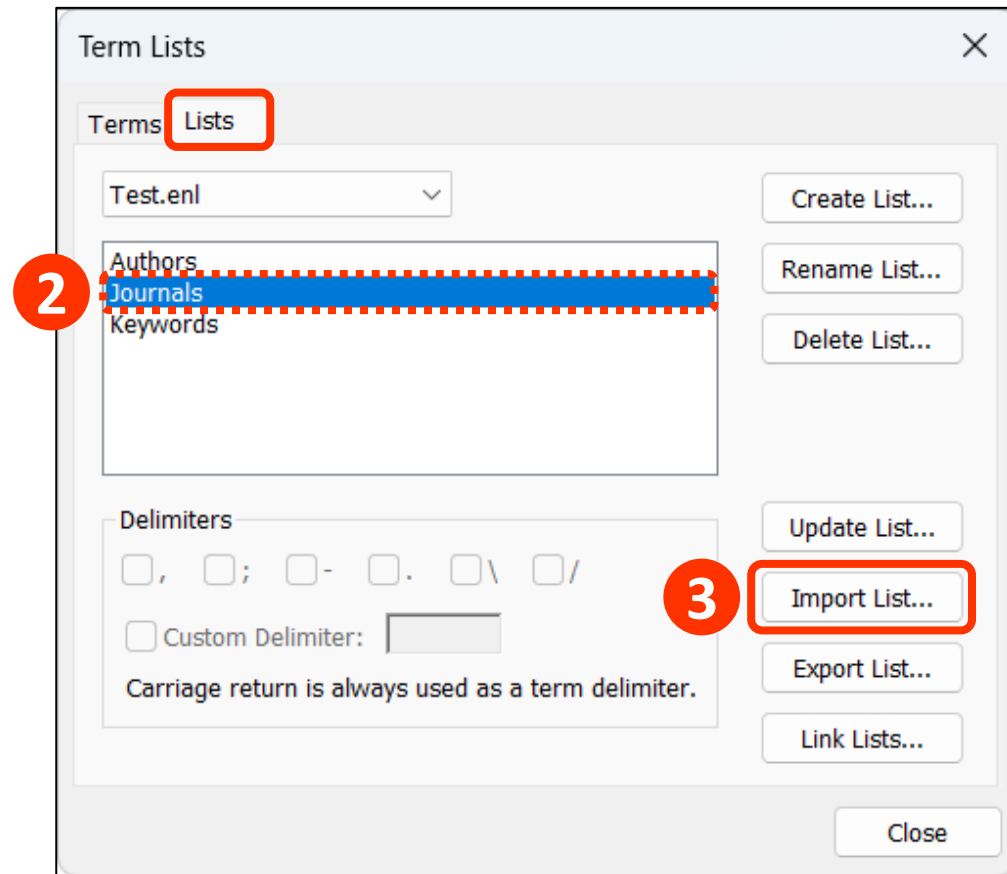
Vancouver Style uses the abbreviated journal names

Journal Term Lists (3)



Defining Journal Term Lists

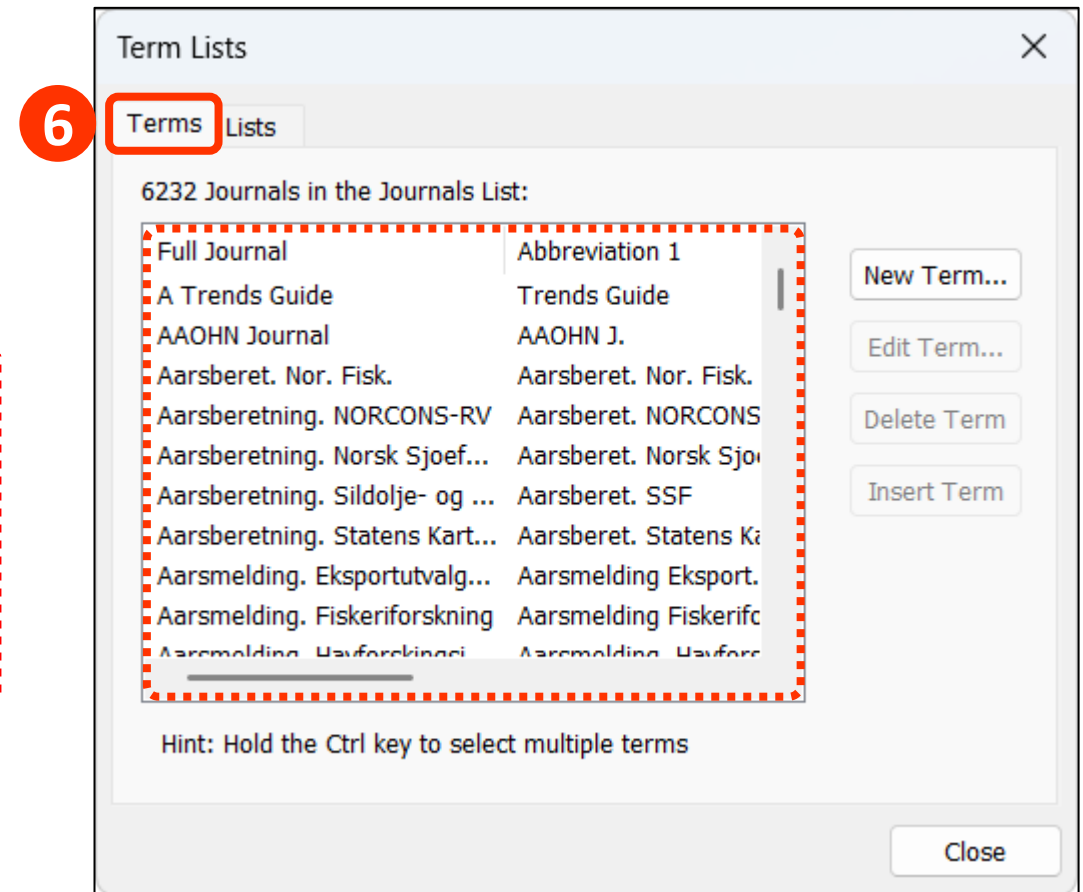
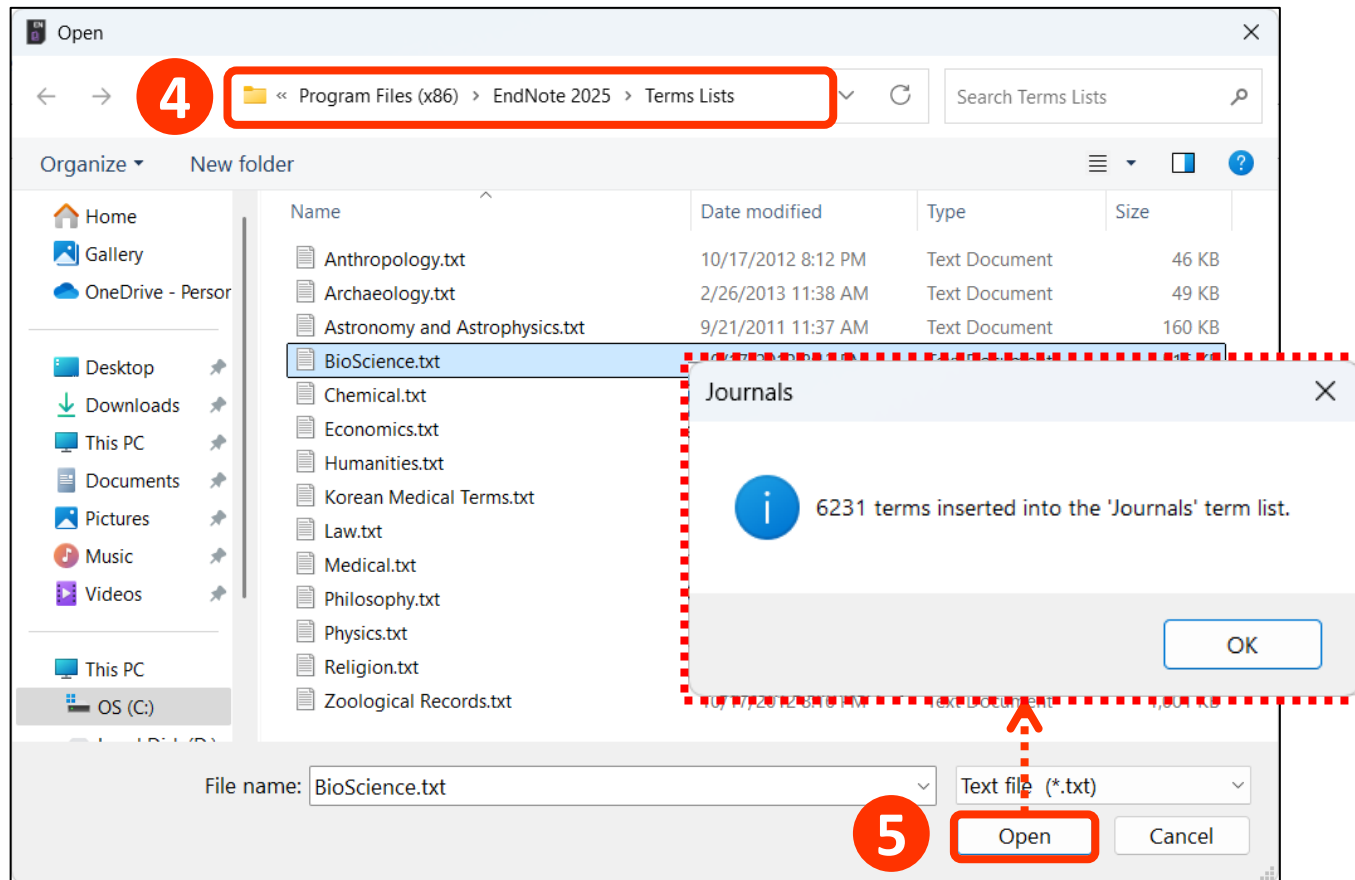
1. Go to **Library > Define Term Lists...**
2. In the Term Lists box, on **Lists** tab, select **Journals**
3. Click on **Import List...**



Journal Term Lists (4)

Defining Journal Term Lists (cont.)

4. Browse to **C:\Program Files (x86)\EndNote 2025\Terms Lists**
5. Choose the appropriate term list files (e.g. BioScience.txt), then click **Open** to complete.
6. Select tab **Terms** to view the imported journal lists, then close.



Entering Reference Data

- **Direct Export**
- **Import PDF**
- **Manual Typing**

Entering Reference Data

Direct Export



ScienceDirect

PubMed

Scopus®

Google Scholar

Import PDF



Manual Typing

New Reference (Test.enl)

File Edit References Groups Tags Library Tools Window Help

Edit PDF Edit & PDF

B / U X' X: Aa Q Tools Save

Tags Manage tags

Reference Type Journal Article

Author

Year

Title

Journal

Volume

Part/Supplement

Issue


Pages

Start Page


Errata

Epub Date

Mahidol eJournal Access / EZproxy (1)



Mahidol University
Library and Knowledge Center
Mahidol eJournal Access

☐ I'm not a robot 
reCAPTCHA
Privacy - Terms

firstname.sur (for staff) or u61xxx or g61xxx

type your password

028002680-9 ext.4262,4265 [Manual](#)
liwww@mahidol.ac.th

- URL: <https://ejournal.mahidol.ac.th>
- Login with MU Internet account to access subscribed e-resources
- Support all devices with all operating systems (Windows, MacIntosh, and Linux), smartphones and tablets with iOS (iPhone / iPad) and Android

***** Limitation *****

Must follow the links given on the library's website

Mahidol eJournal Access / EZproxy (2)

The screenshot shows the Mahidol University Faculty of Science website. The URL <https://stang.sc.mahidol.ac.th/> is displayed in the top navigation bar. The E-Resources menu is open, showing options like E-DATABASES, E-JOURNALS, and E-BOOKS. A red box highlights the eJournal Access button in the bottom navigation bar. A red box also highlights the URL <https://ejournal.mahidol.ac.th> in the top navigation bar.

MU Home SC Internet SC Intranet

<https://stang.sc.mahidol.ac.th/>

Mahidol University
Faculty of Science

Stang Mongkolsuk Library and Information Division
Wisdom of the Land

Home About **A** E-Resources Library Resources Library Services Research Help Desk IT Help **B** Museum Contact us

Access to Mahidol University requires login with MU account via <https://ejournal.mahidol.ac.th>

Remote access (off-campus)

- E-DATABASES
- E-JOURNALS
- E-BOOKS
- Search Guides/ Online Tutorials
- Free Trial Databases
- Thai Databases
- THAI e-journals
- E-THESES
- E-PATENTS
- E-NEWSPAPERS & MEDIAS
- E-DICTIONARY
- List of Libraries in Thailand

C Co-learning Space

D eJournal Access

Electronic Information Service

Scopus ScienceDirect SciVal SJR Journal Citation Reports EBSCO SCIFINDER ACS Publications

PubMed.gov nature WILEY Wiley Online Library Springer Link AMERICAN SOCIETY FOR MICROBIOLOGY BMC zbmATH Open Ovid

DOAJ Google Scholar turnitin EndNote

You can access it by:


- (A) Selecting the **E-Resources menu** to find E-Databases, E-Journals, or E-Books
- (B) Clicking the **URL** at the top of the webpage
- (C) Clicking the **eJournal Access symbol**
- (D) Selecting the desired **E-databases label** from the bottom of the webpage


Direct export: ScienceDirect




ScienceDirect®

Journals & Books

 Help

 My account

 Mahidol University

Search for peer-reviewed journal articles and book chapters (including [open access](#) content)

Find articles with these terms

In this journal or book title

Author(s)

 Search


[Advanced search](#)


EUREKA, EVERY DAY




Instantly surface, cite, compare and explore trusted evidence from deep within peer-reviewed literature with ScienceDirect AI.

[Explore ScienceDirect AI ↗](#)

 ScienceDirect AI

 Confidence in research

 Climate change

 FEEDBACK



1. Select the records you need.
2. Click **Export** at the top of the search results.
3. Click **Export citation to RIS** to download data to your device.
4. Double-click on the downloaded file to automatically open it in your library.

Find articles with these terms

coronavirus

Advanced search

1



Download 25 articles

2



Export

Export



25 citations selected

3

> Save to RefWorks

> Export citation to RIS

> Export citation to BibTeX

> Export citation to text



1



Research article • Full text access

Structural insights into the receptor-binding domain

Structure, Available online 29 April 2025

Chenghai Wang, Xiaoyan Nan, ... Jun Lan



View PDF

Abstract

Graphical Abstract

Extracts

Figures

Export



2



Research article • Open access

Anti-SARS-CoV-2 prodrug ATV006 has broad-spectrum and animal

coronaviruses

Acta Pharmaceutica Sinica B, Available online 10 March 2025

Tiefeng Xu, Kun Li, ... Deyin Guo



View PDF

Abstract

Graphical Abstract

Extracts

Figures

Export

4



ScienceDirect_citations_1

746155005304.ris

RIS Formatted File

Direct export: PubMed



National Library of Medicine
National Center for Biotechnology Information

Log in



Search

Advanced

PubMed® comprises more than 38 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.

1. Select the records you need.
2. Click **Send to** at the top of search results, then select **Citation manager**.
3. Setup the **Selection** to choose number of the results.
4. Click the **Create file** to download data to your device.
5. Double-click on the downloaded file to automatically open it in your library.

The screenshot shows the PubMed search results page for the query "coronavirus". The search bar at the top contains "coronavirus" and a "Search" button. Below the search bar are links for "Advanced", "Create alert", "Create RSS", and "User Guide".

Annotations and steps shown:

- Annotation 1:** A red box highlights the first search result, which is a citation for "Broad-spectrum coronavirus antiviral drug discovery." by Totura AL, Bavari S. The citation includes the journal "Expert Opin Drug Discov." and the year "2019".
- Annotation 2:** A red box highlights the "Send to" button at the top of the search results.
- Annotation 3:** A red box highlights the "Selection (2)" dropdown menu in the "Create a file for external citation management software" dialog. The dropdown shows "All results on this page", "All results", and "Selection (2)".
- Annotation 4:** A red box highlights the "Create file" button in the "Create a file for external citation management software" dialog.
- Annotation 5:** A red box highlights the downloaded file "pubmed-coronaviru.nbib" (NBIB Formatted File) with a size of 5.91 KB.

The "Create a file for external citation management software" dialog is open, showing the "Selection (2)" dropdown and the "Create file" button. The dialog also includes a "Cancel" button and a "Clear selection" link.

Direct export: Scopus



Scopus

 Search

[Lists](#)

[Sources](#)

[SciVal](#) ↗

[?](#)



[Create account](#)

[Sign in](#)

Start exploring

Documents

[Authors](#)

[Researcher Discovery](#)

[Organizations](#)

[Search tips](#) [?](#)


Search within

Article title, Abstract, Keywords



Search documents *

[+ Add search field](#) [Add date range](#) [Advanced document search](#) >

[Search](#) 

Search History

[Saved Searches](#)



Start searching and your history will appear here. If you need help to start searching, see our [search tips](#).

[Feedback](#)

Direct export: Scopus

1. Select the records you need.
2. Click **Export** and choose Reference managers as **EndNote (RIS)**, then it will present an Export document setting Box

Search within
Article title, Abstract, Keywords

Search documents *
coronavirus

+ Add search field

Reset Search

Documents Preprints Patents

1 All **2** Export Download

File types

- CSV
- RIS
- BibTeX
- Plain text

Reference managers

- Mendeley
- Refworks (RIS)
- Zotero (RIS)
- EndNote (RIS)

Platforms

- SciVal

Export 10 documents to EndNote as a RIS file

The RIS format is used for exporting references from Scopus to a reference management tool (e.g., Zotero, EndNote, RefWorks). To import references to EndNote, open the .ris file with EndNote and follow the prompts. Make sure that .ris files are associated with EndNote on your system.

What information do you want to export?

<input checked="" type="checkbox"/> Citation information	<input type="checkbox"/> Bibliographical information	<input type="checkbox"/> Abstract & keywords	<input type="checkbox"/> Funding details	<input type="checkbox"/> Other information
<input checked="" type="checkbox"/> Author(s)	<input type="checkbox"/> Affiliations	<input type="checkbox"/> Abstract	<input type="checkbox"/> Number	<input type="checkbox"/> Tradenames & manufacturers
<input checked="" type="checkbox"/> Document title	<input type="checkbox"/> Serial identifiers (e.g. ISSN)	<input type="checkbox"/> Author keywords	<input type="checkbox"/> Acronym	<input type="checkbox"/> Accession numbers & chemicals
<input checked="" type="checkbox"/> Year	<input type="checkbox"/> PubMed ID	<input type="checkbox"/> Indexed keywords	<input type="checkbox"/> Sponsor	<input type="checkbox"/> Conference information
<input checked="" type="checkbox"/> EID	<input type="checkbox"/> Publisher		<input type="checkbox"/> Funding text	<input type="checkbox"/> Include references
<input checked="" type="checkbox"/> Source title	<input type="checkbox"/> Editor(s)			
<input checked="" type="checkbox"/> Volume, issues, pages	<input type="checkbox"/> Language of original document			
<input checked="" type="checkbox"/> Citation count	<input type="checkbox"/> Correspondence address			
<input checked="" type="checkbox"/> Source & document type	<input type="checkbox"/> Abbreviated source title			
<input checked="" type="checkbox"/> Publication stage				
<input checked="" type="checkbox"/> DOI				
<input checked="" type="checkbox"/> Open access				

Select all information

☐ Save as preference **Export**

CoV-2 specific memory
different blood
eosinophil counts

Zhao, F., Luo, Y., Li, B.,
... Zhong, N., Chen, R.

Pulmonology, 31(1), 2025
pp. 2424642

Feedback

Direct export: Scopus

Export 10 documents to EndNote as a RIS file [?](#)

The RIS format is used for exporting references from Scopus to a reference management tool (e.g., Zotero, EndNote, RefWorks).

To import references to EndNote, open the .ris file with EndNote and follow the prompts. Make sure that .ris files are

3 What information do you want to export?

☒ Citation information

☒ Author(s)

☒ Document title

☒ Year

☒ EID

☒ Source title

☒ Volume, issues, pages

☒ Citation count

☒ Source & document type

☒ Publication stage

☒ DOI

☒ Open access

☐ Bibliographical information

☐ Affiliations

☐ Serial identifiers (e.g. ISSN)

☐ PubMed ID

☐ Publisher

☐ Editor(s)

☐ Language of original document

☐ Correspondence address

☐ Abbreviated source title

☐ Abstract & keywords

☐ Abstract

☐ Author keywords

☐ Indexed keywords

☐ Funding details

☐ Number

☐ Acronym

☐ Sponsor

☐ Funding text

5



scopus.ris
RIS Formatted File
1.33 MB

Select all information

☐ Save as preference

4

Export

3. Select the record's information. (at least the **Citation information** is recommended)
4. Click the **Export** to download data to your device.
5. Double-click on the downloaded file to automatically open it in your library.

Direct export: Google Scholar




My profile



My library

SIGN IN

Google Scholar

A blue square button with a white magnifying glass icon.

Stand on the shoulders of giants



EN

[Privacy](#) [Terms](#) [Help](#)

Articles

About 2,390,000 results (0.06 sec)

Any time

Since 2025

Since 2024

Since 2021

Custom range...

A review of coronavirus disease-2019 (COVID-19)

[T Singhal](#) - The indian journal of pediatrics, 2020 - Springer

... On 7th January the virus was identified as a **coronavirus** that had >95% homology with the bat **coronavirus** and > 70% homology with the SARS-CoV-2.



1

Cite

Cited



Cite

1. Click the **Cite** icon for the record you need.
2. Click the **EndNote** to download data to your device.
3. Double-click on the downloaded file to automatically open it in your library.

MLA Singhal, Tanu. "A review of coronavirus disease-2019 (COVID-19)." *The indian journal of pediatrics* 87.4 (2020): 281-286.

APA Singhal, T. (2020). A review of coronavirus disease-2019 (COVID-19). *The indian journal of pediatrics*, 87(4), 281-286.

Chicago Singhal, Tanu. "A review of coronavirus disease-2019 (COVID-19)." *The indian journal of pediatrics* 87, no. 4 (2020): 281-286.

Harvard Singhal, T., 2020. A review of coronavirus disease-2019 (COVID-19). *The indian journal of pediatrics*, 87(4), pp.281-286.

Vancouver Singhal T. A review of coronavirus disease-2019 (COVID-19). *The indian journal of pediatrics*. 2020 Apr;87(4):281-6.

Bit

2

EndNote

RefMan

RefWorks

[PDF] [springer.com](#)

Full Text @ Mahidol Univ

[PDF] [asm.org](#)

Full View

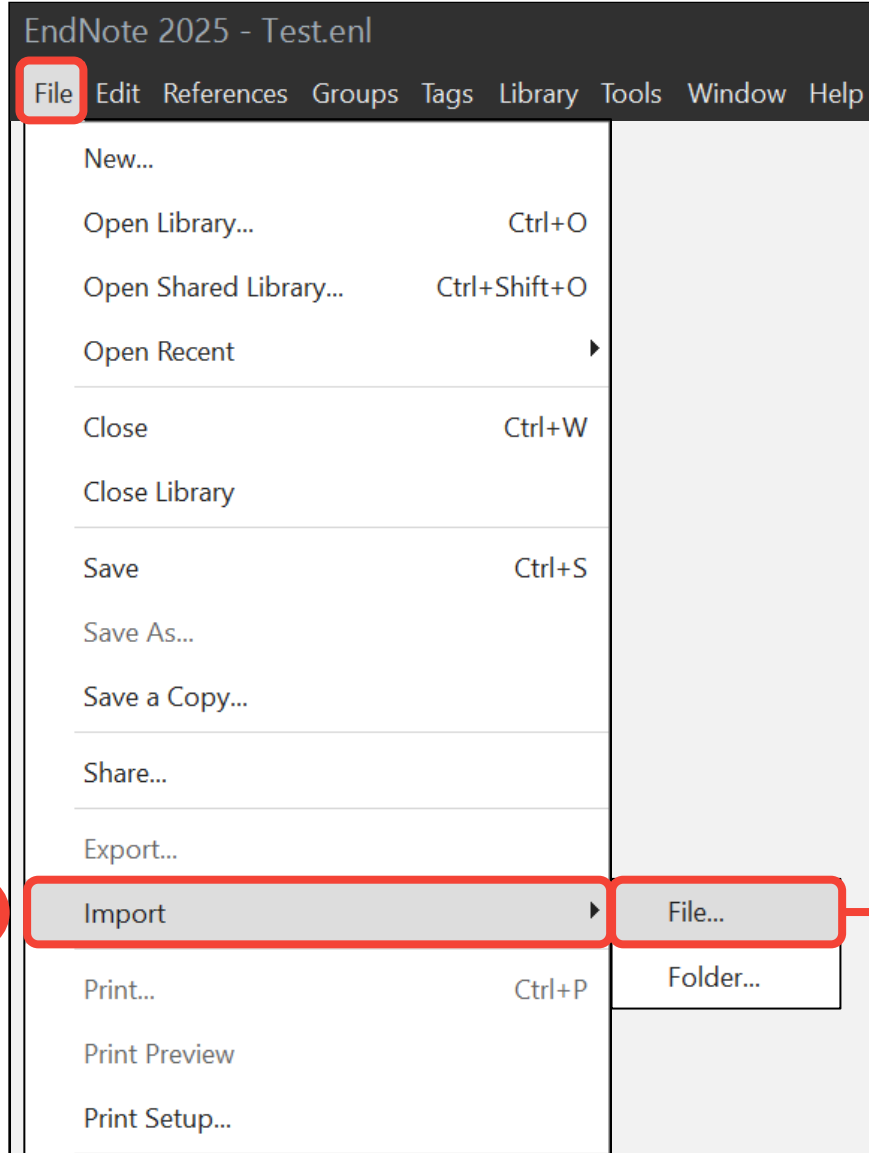
[PDF] [nih.gov](#)

3

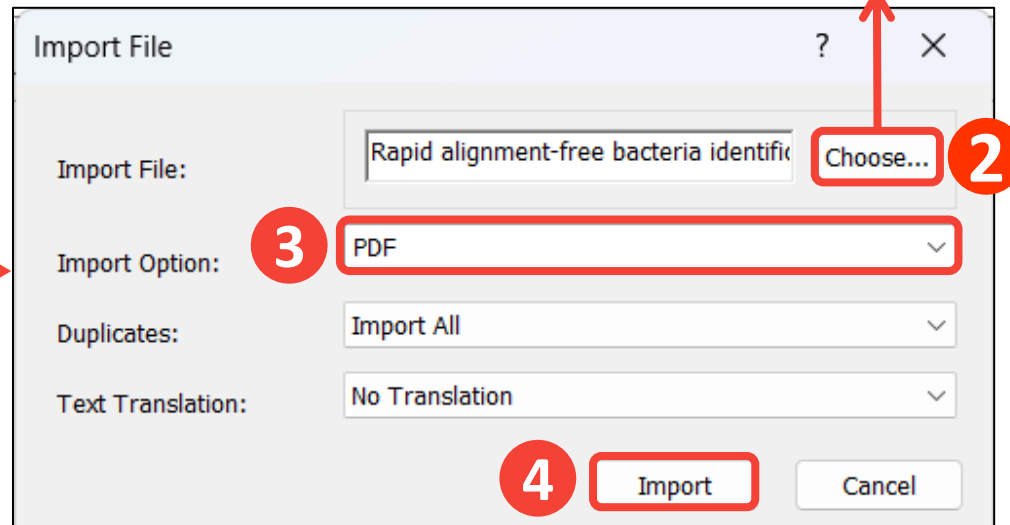
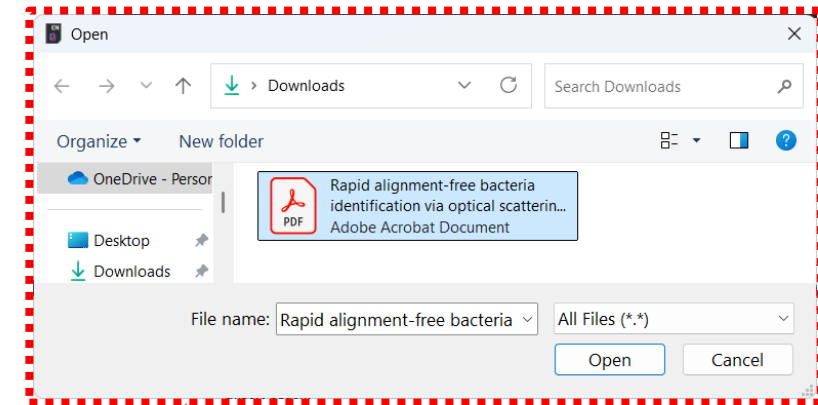
EN

scholar.enw
EndNote Import File
188 bytes

Import PDF File (1)



1. Go to **File > Import > File...** to open the Import File dialog.
2. Click **Choose** to select a PDF file from your hard drive.
3. Select Import Option as **PDF**
4. Click **Import** to import a PDF file into your library.



Import PDF File (2)

5. Reference with PDF file will be displayed as results

EndNote 2025 - Test.enl

File Edit References Groups Tags Library Tools Window Help

Library Status

- All References 1
- Imported References 1
- Recently Added 1
- Unfiled 1
- Trash
- MY GROUPS
 - My Groups
- MY TAGS +
- FIND FULL TEXT
- GROUPS SHARED B...
- ONLINE SEARCH +
 - Jisc Library Hub Di...
 - Library of Congress
 - PubMed (NLM)
 - Utah St U
 - Web of Science Co...


Search for group

Imported References +

Advanced search

Imported References 5

1 Reference

	Author	Year	Title	Journal	Last Updated	Reference Type
	Romphosri,...	2024	Rapid alignmen...	Scientific Reports	7/5/2025	Journal Article

Romphosri, 2024 #3 Summary Edit PDF

55%

Romphosri-2024-Rapid alignment-free bacteria i...

www.nature.com/scientificreports

scientific reports

OPEN Rapid alignment-free bacteria identification via optical scattering with LEDs and YOLOv8

Suwat Romphosri¹, Dakrong Pissuwan¹, Nungnit Wattanavichien¹, Pakpoom Buabthong² & Tanant Waritnant^{1,2}

Rapid and accurate bacterial identification is essential for timely treatment of infections like sepsis. While traditional methods are reliable, they lack speed, and advanced molecular techniques often suffer from cost and complexity. The bacterial detection technology based on optical scattering system offers a rapid, label-free alternative but traditionally relies on complex lasers and analysis. Our enhanced approach utilizes RGB light emitting diodes (LEDs) as the light source. Three diffraction images of bacterial colonies from different LED colors are separately captured by a USB camera and combined using an image registration algorithm to enhance image sharpness. Our approach utilizes an object detection model, i.e., YOLOv8, for analysis achieving high-accuracy differentiation between bacterial strains. We demonstrate the effectiveness of this approach, achieving an average accuracy of 97% (mAP50 of 0.97), including accurate discrimination of closely related strains and the significant pathogen *Staphylococcus aureus* MRSA 1320. Our enhancement offers advantages in affordability, usability, and seamless integration into existing workflows, providing an alternative for rapid bacterial identification.

Keywords Bacterial detection, Optical scattering, Machine learning, YOLOv8s, Spatial coherence

Rapid and precise bacterial identification is pivotal in modern healthcare for numerous reasons. Firstly, it dramatically enhances treatment efficacy in critical conditions such as sepsis, where every hour count¹. Timely and accurate identification of the causative bacterial agent enables clinicians to promptly administer the most effective antibiotics, thereby significantly improving patient survival rates. Furthermore, the ability to identify bacteria quickly plays a vital role in combating antibiotic resistance. By reducing the need for broad-spectrum antibiotics, which are often used when the causative agent is unknown, targeted therapy based on precise bacterial identification helps preserve the efficacy of these critical drugs. This targeted approach also minimizes the risk of antibiotic misuse, a major factor in the development of antibiotic-resistant strains of bacteria². Economically, rapid bacterial identification can lead to significant healthcare savings. By enabling quicker diagnosis and treatment, it can reduce the length of hospital stays and the associated costs³. This efficiency not only benefits patients but also helps healthcare systems manage resources more effectively. In terms of patient safety, rapid and precise identification minimizes the risk of adverse reactions associated with inappropriate antibiotic use. In summary, effective bacterial identification is a fundamental aspect of contemporary healthcare, playing a critical role in improving clinical outcomes, preventing the spread of infections, reducing healthcare costs, enhancing patient safety, and adding the global fight against antibiotic resistance.

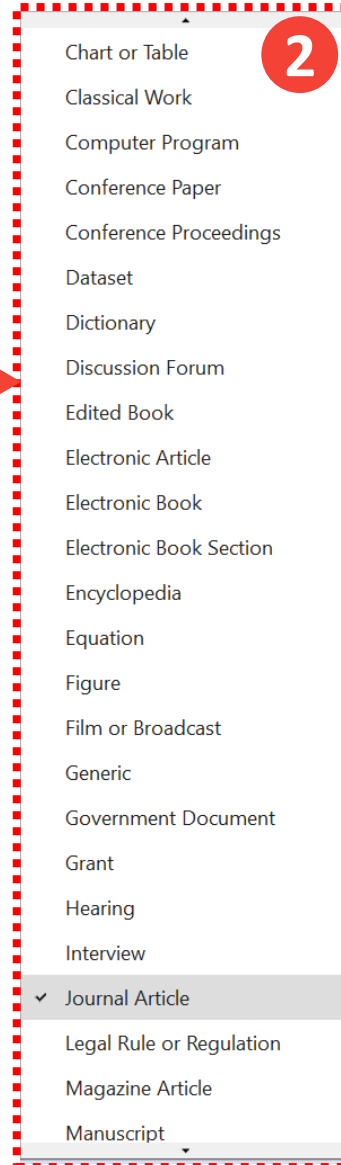
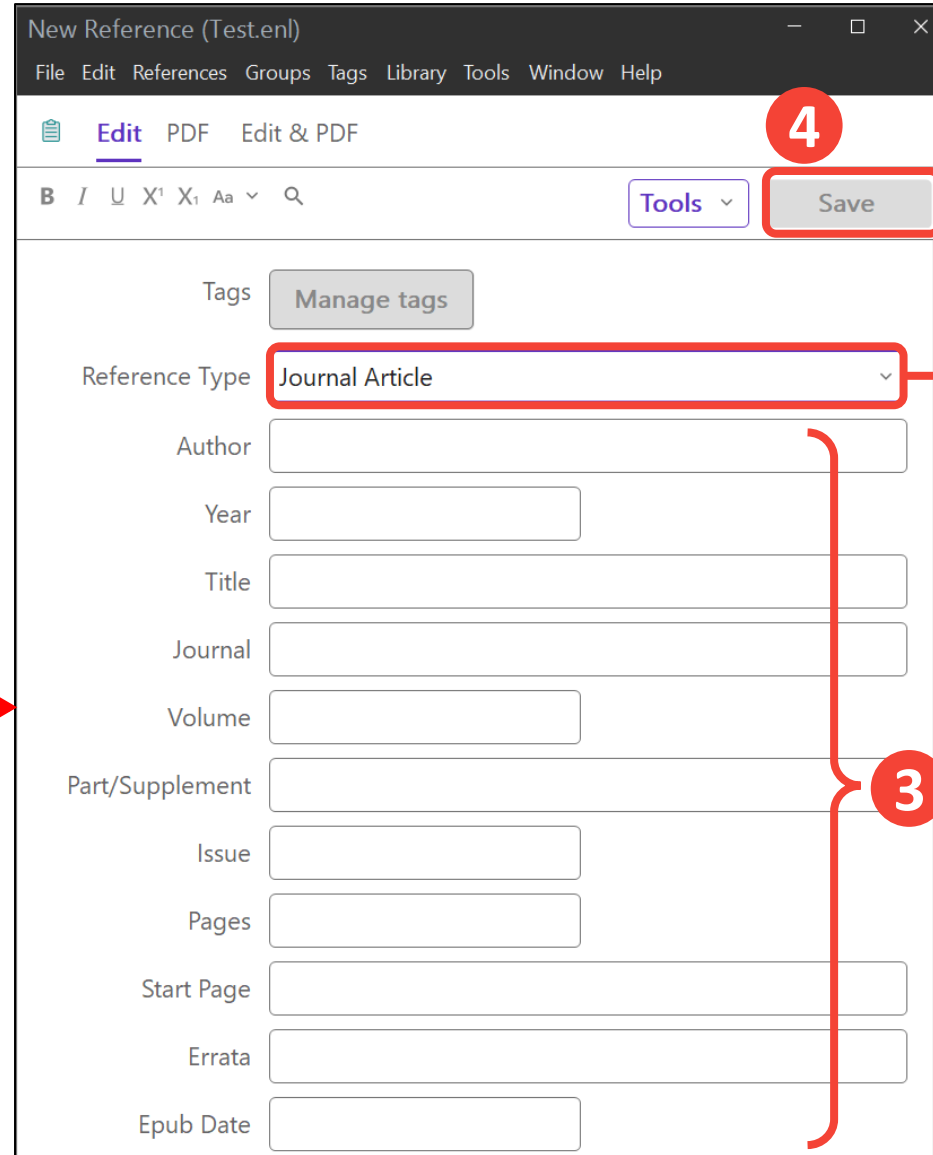
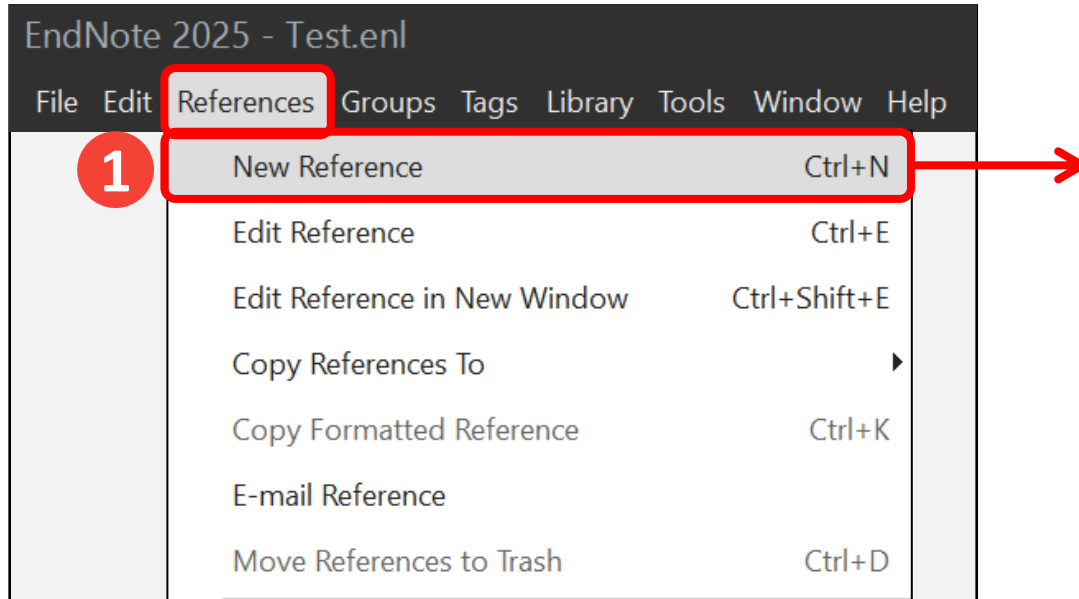
Various bacterial detection techniques have both specific benefits and drawbacks. Traditional culture methods are dependable but slow, often requiring several days for conclusive results⁴. Spectroscopic techniques such as Near-infrared (NIR) and Raman spectroscopy specify macromolecular composition of bacterial cells, such as nucleic acids, proteins, carbohydrates, and fatty acids, providing distinct absorption spectra⁵. However, the challenge in microbial spectroscopy lies in the fact that most microorganisms have similar chemical compositions, resulting in very similar spectra. Polymerase Chain Reaction (PCR) is utilized to detect bacterial pathogens by targeting specific DNA sequences with specific primers. Higher sensitivity is offered by PCR compared to traditional culture and staining methods⁶, and the process is completed within a few hours⁷. However, certain drawbacks are associated with PCR: its specificity may be lower, which increases the risk of false positives⁸. Additionally, because specific primers are necessary for identifying different microorganisms, potential pathogens

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Scientific Reports | (2024) 14:20438 | https://doi.org/10.1038/s41598-024-71238-0 nature portfolio

Manual Typing (1)

1. Go to **References > New Reference**.
A blank reference window appears.
2. Select a **Reference Type** from the drop-down menu. (the default type is Journal Article)
3. Enter bibliographic data into the fields.
4. Saving reference by clicking the **Save**.



Manual Typing (2)

How to enter the author's name

- Enter one name per line.
- New Terms appear in **red text**.

Author names formats

- First_name Middle_name Last_name
Albert Einstein
Albert Lester Lehninger
- Last_name, First_name Middle_name
Einstein, Albert
Lehninger, Albert Lester

Institute/Corporate name formats

- add a comma after the name.
World Health Organization,
Mahidol University,
คณะวิทยาศาสตร์ มหาวิทยาลัยมหิดล,

Thai author name formats

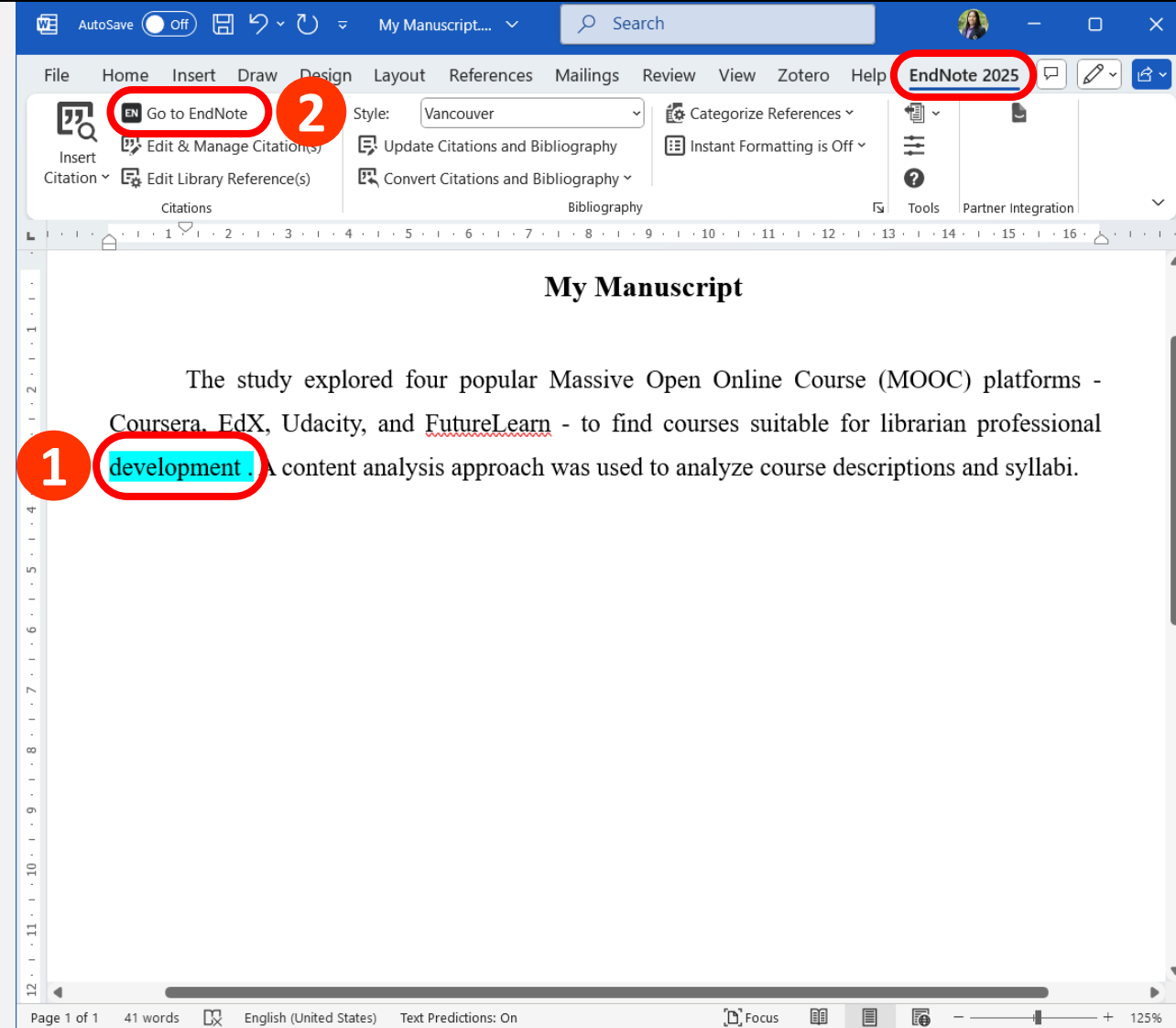
- add a comma after the name
กนกพร งามสว่างรุ่งโรจน์,

Working with MS Word

- **Inserting Citations**
- **Edit & Manage Citations**
- **Configure Bibliography**
- **Convert Citations and Bibliography**

Inserting Citations (1)

1. Place the cursor on the position where you would insert the citation in Word document.
2. Go to the EndNote 2025 menu, and select **Go to EndNote**
3. Select the desired references from the EndNote library.
4. Click Insert sign.
5. The inserted citation will appear in your manuscript.
(show as **citation in text** and **bibliography** below)



Inserting Citations (2)

EndNote 2025 - Test.enl

File Edit References Groups Tags Library Tools Window Help

Library Status

- All References 200
- Recently Added 200
- Unfiled 200
- Trash

MY GROUPS

- My Groups

MY TAGS +

FIND FULL TEXT

GROUPS SHARED B...

ONLINE SEARCH +

- Jisc Library Hub Di...
- Library of Congre...
- PubMed (NLM)
- Utah St U
- Web of Science Co...

Search for group

All References +

Advanced search

All References
200 References

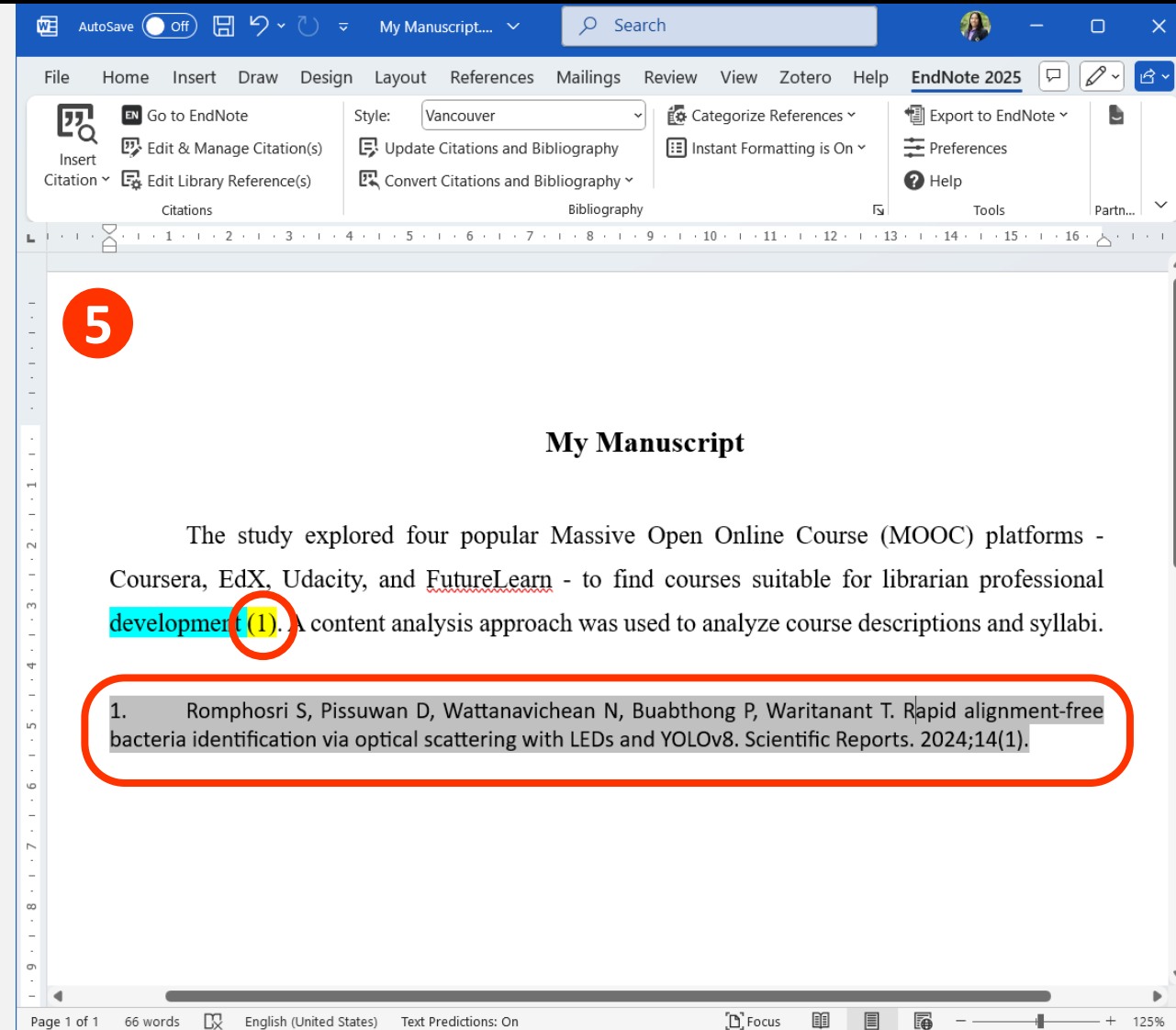
4

	Author	Year	Title	Journal	Last Updated
	Hall, V.; Fo...	2022	Protection again...	New England Jo...	7/5/2025
	Bobrovitz, ...	2023	Protective effect...	The Lancet Infe...	7/5/2025
	Qin, S.; Xia...	2022	Pseudomonas a...	Signal Transduct...	7/5/2025
	Nundy, S.; ...	2022	The Quintuple A...	JAMA	7/5/2025
3	Rompfosri,...	2024	Rapid alignment...	Scientific Reports	7/5/2025
	Viana, R.; ...	2022	Rapid epidemic ...	Nature	7/5/2025
	Gillespie, ...	2022	The reactome p...	Nucleic Acids R...	7/5/2025
	Zheng, C.; ...	2022	Real-world effec...	International Jo...	7/5/2025
	Nahm, F. S.	2022	Receiver operati...	Korean Journal ...	7/5/2025
	Thangavel, ...	2022	Recent Insights i...	International Jo...	7/5/2025
	Han, P.; Li, ...	2022	Receptor bindin...	Cell	7/5/2025
	Sallnow, L;...	2022	Report of the La...	The Lancet	7/5/2025
	Abbass, K.; ...	2022	A review of the ...	Environmental S...	7/5/2025
	Samji, H.; ...	2022	Review: Mental ...	Child and Adole...	7/5/2025

1. Place the cursor on the position where you would insert the citation in Word document.
2. Go to the EndNote 2025 menu, and select **Go to EndNote**
3. Select the desired references from your EndNote library.
4. Click **Insert** sign.
5. The inserted citation will appear in your manuscript. (show as **citation in text** and **bibliography** below)

Inserting Citations (3)

1. Place the cursor on the position where you would insert the citation in Word document.
2. Go to the EndNote 2025 menu, and select **Go to EndNote**
3. Select the desired references from the EndNote library.
4. Click **Insert** sign.
5. The inserted citation will appear in your manuscript.
(show as **citation in text** and **bibliography** below)



Edit & Manage Citation

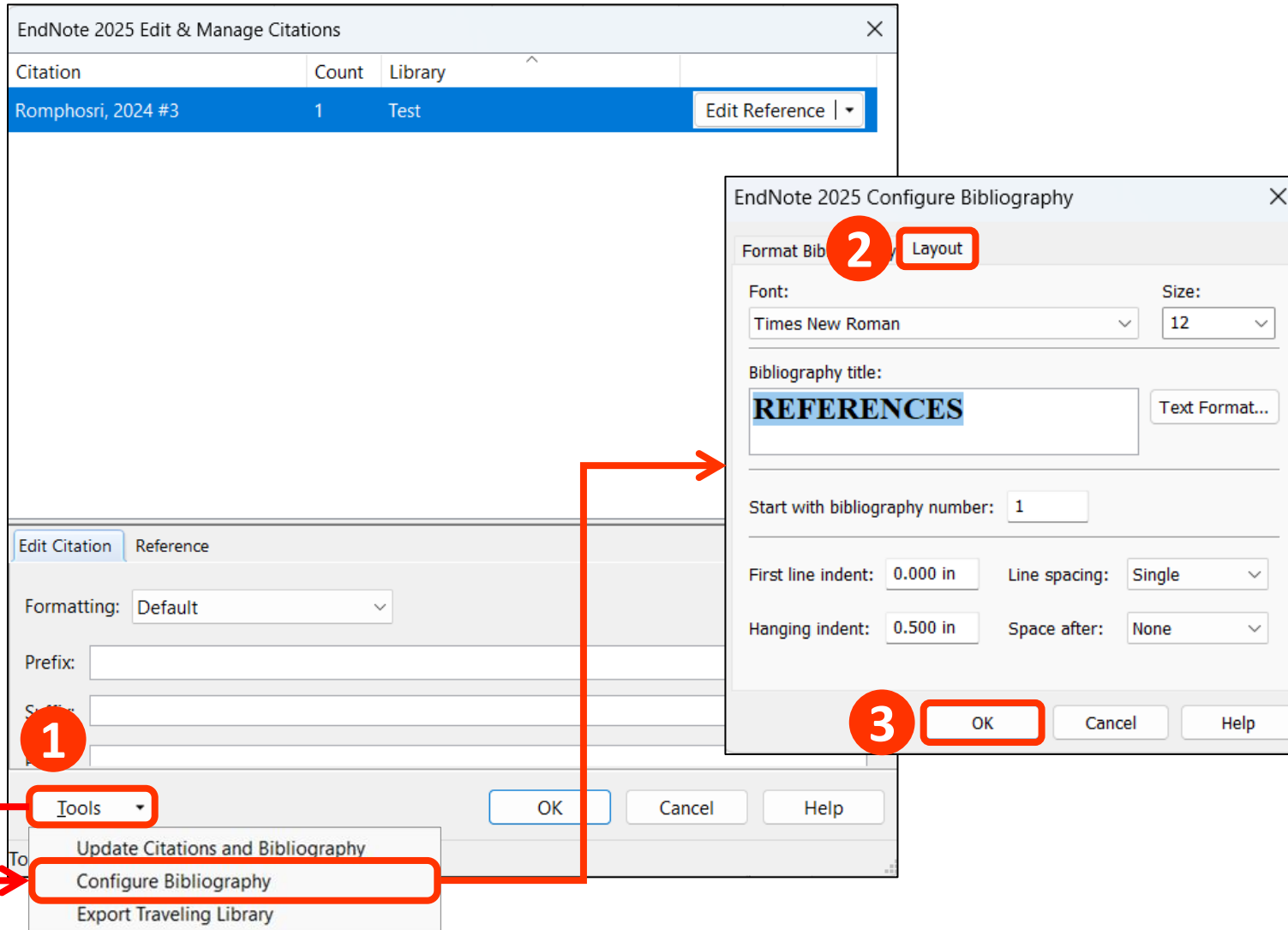
The screenshot shows the EndNote 2025 software interface. The 'EndNote 2025' menu is highlighted with a red circle and the number 1. The 'Edit & Manage Citation(s)' option is also highlighted with a red circle and the number 1. A red arrow points from this option to the 'EndNote 2025 Edit & Manage Citations' dialog box. The dialog box has a table with the following data:

Citation	Count	Library
Romphosri, 2024 #3	1	Test

The 'Edit Reference' dropdown menu is open, showing options: 'Edit Library Reference', 'Find Reference Updates...', 'Remove Citation', 'Insert Citation', and 'Update from My Library...'. The 'Edit Library Reference' option is highlighted with a red circle and the number 2. The 'Edit Citation' tab is selected in the dialog box. The 'Formatting' dropdown is set to 'Default'. The 'Prefix', 'Suffix', and 'Pages' fields are empty. The 'Tools' dropdown is set to 'Tools'. The 'OK' button is highlighted with a red circle and the number 3. The status bar at the bottom indicates 'Totals: 1 Citation Group, 1 Citation, 1 Reference'.

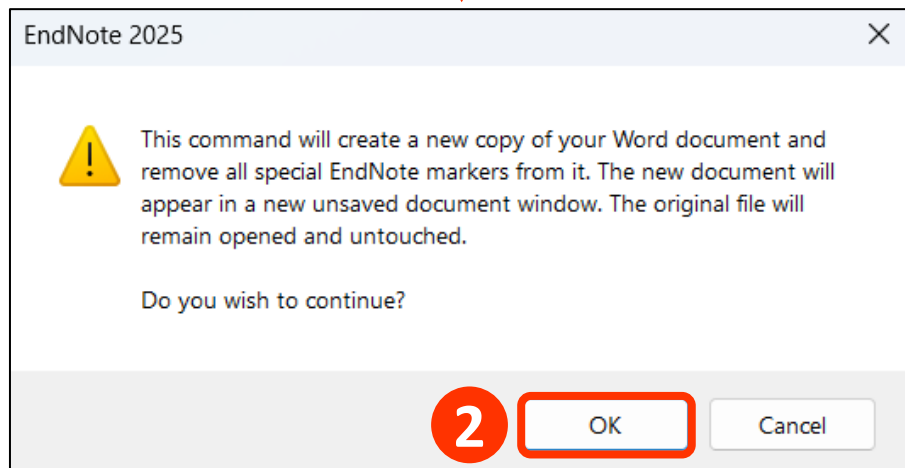
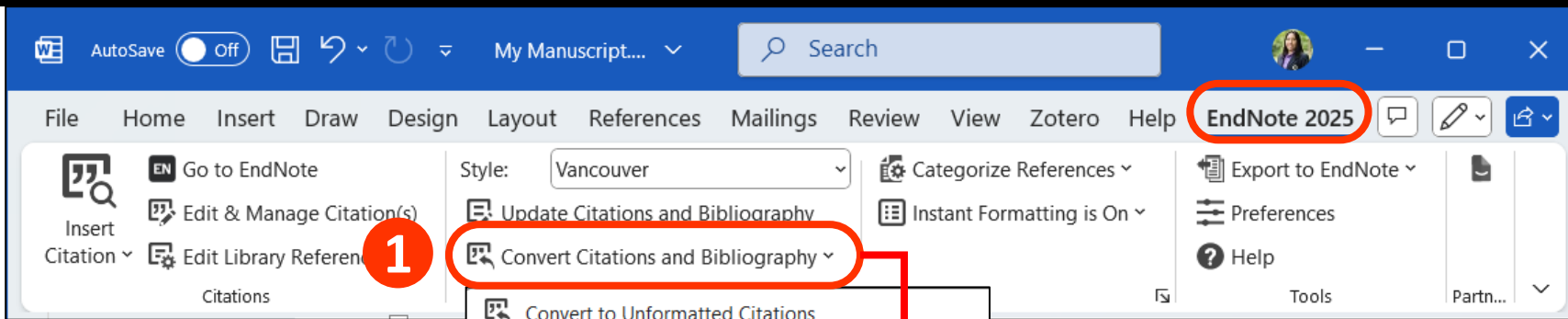
1. Go to EndNote 2025 menu, select **Edit & Manage Citation(s)** to display EndNote 2025 Edit & Manage Citations box.
2. You can add or remove citations from multiple citations or change the order of citations.
 - **Edit Library Reference**: select this command to edit the corresponding references in EndNote directly.
 - **Insert**: Use this to add another citation within the same set of delimiters.
 - **Remove**: Highlight a citation and click Remove to delete it from the in-text citation.
 - **Up and Down Arrows**: Highlight a reference and use the arrows to change the order of the display.
3. Click **OK** to implement your changes.

Configure Bibliography



1. From EndNote 2025 Edit & Manage Citations box, click on the **Tools** menu at the lower left corner, select **Configure Bibliography**
2. On the **Layout** tab, you can change or verify these settings:
 - **Font and Size:** these are the text font and size used for the bibliography.
 - **Bibliography Title:** to print a title at the top of your bibliography, type the title in this text box.
 - **Text Format:** highlight the bibliography title text and then use the Text Format button to display a dialog where you can change the format of the highlighted text.
3. Click **OK** to implement your changes.

Convert Citations and Bibliography



You may need to remove the 'Cite While You Write' field codes to share your document with a publisher or colleague. Convert to Plain Text will save a copy of your document without formatted 'Cite While You Write' field codes. The formatted citations and the bibliography are saved as text. By following the steps;

1. Go to the EndNote 2025 menu, select **Convert Citations and Bibliography > Convert to Plain Text**
2. Word presents the notification box, read, and click **OK** to continue.
3. A copy of the document, without field codes will appear in a new document window. Then you can save a new name for a copy of your document.

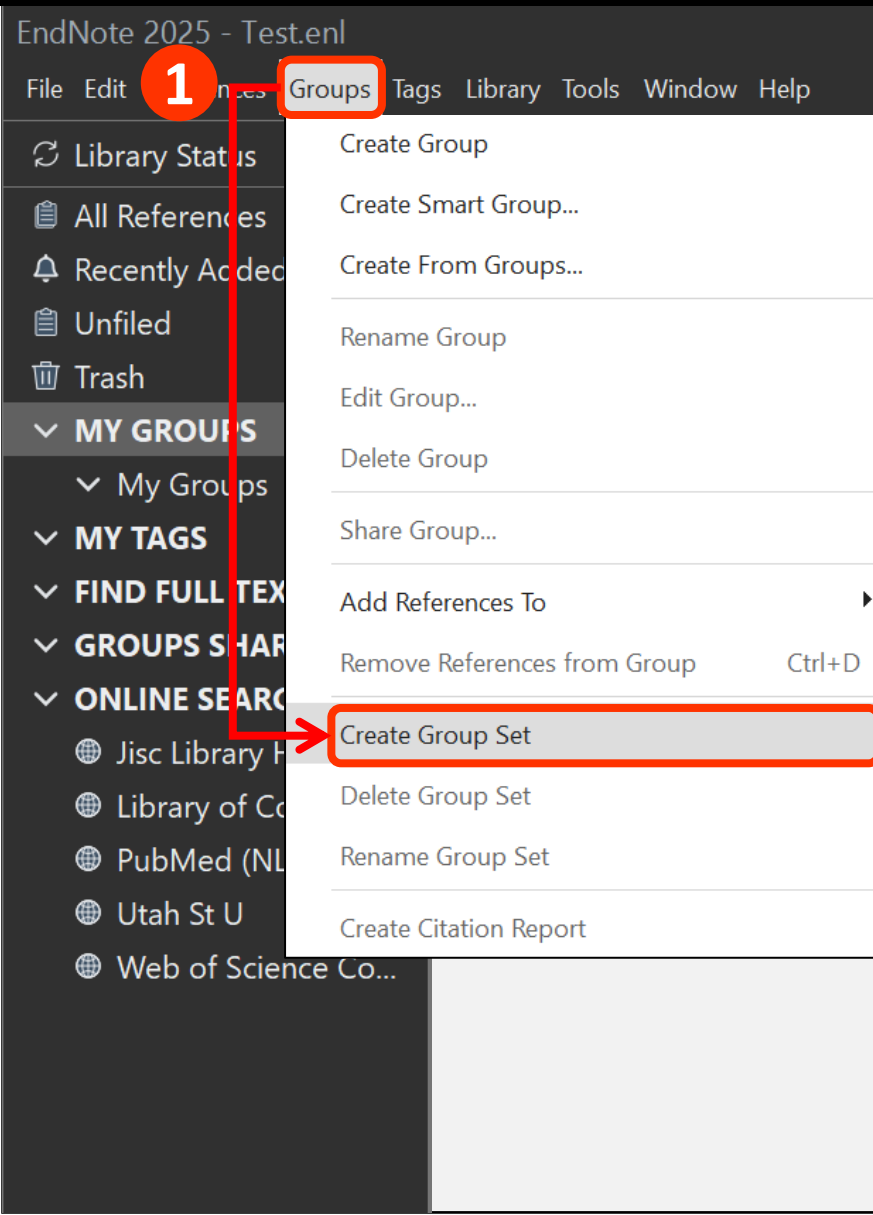
Groups & Tags

- **Group Sets**
- **Custom Groups**
- **Smart Groups**
- **Combination Groups**
- **Tags**

Groups & Tags

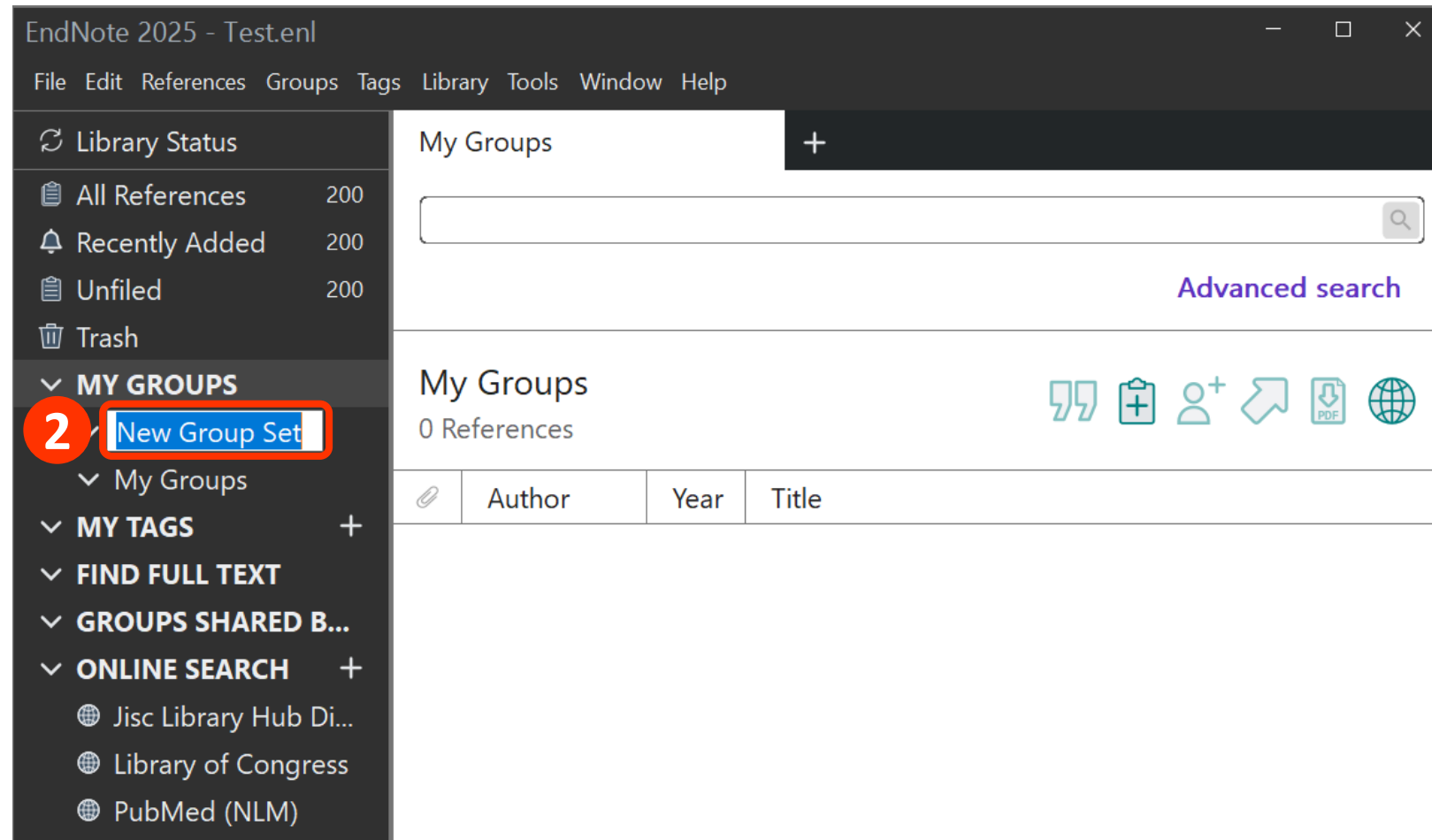
Group Sets	Group sets are the main categories you can use to organize subgroups in EndNote. They can contain any combination of custom groups and smart groups.
Custom Groups	Custom groups are groups you create to manually collect reference items. You can browse through your reference list and drag individual references to a custom group.
Smart Groups	Smart groups are built with search strategies. Smart groups are dynamically updated as you add references to and edit references in the library.
Combination Groups	Combination Groups are used to combine custom and smart groups under a single group.
Tags	Tags are used to organize your references into groups by color.

Group Sets

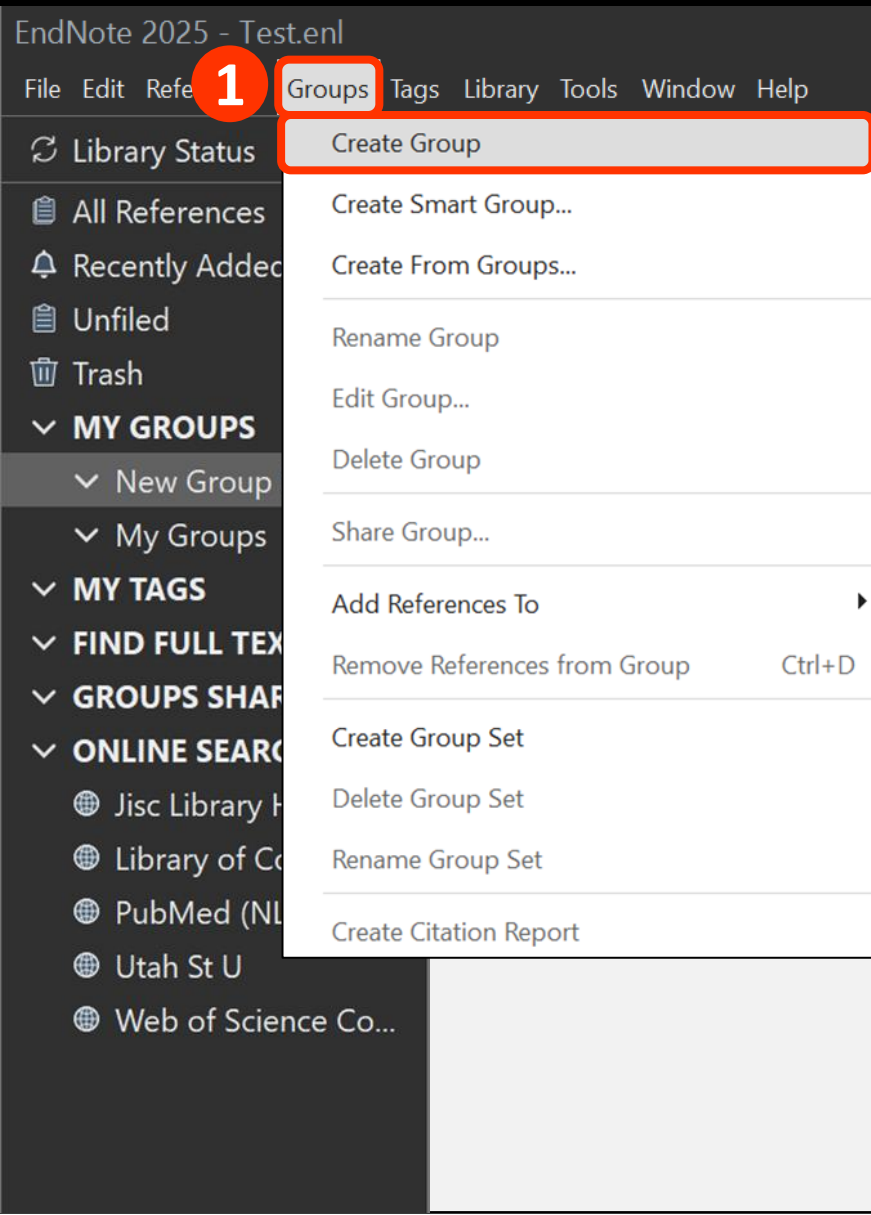


Creating a Group Sets

1. Go to **Groups > Create Group Set**
2. Enter a name for the group set

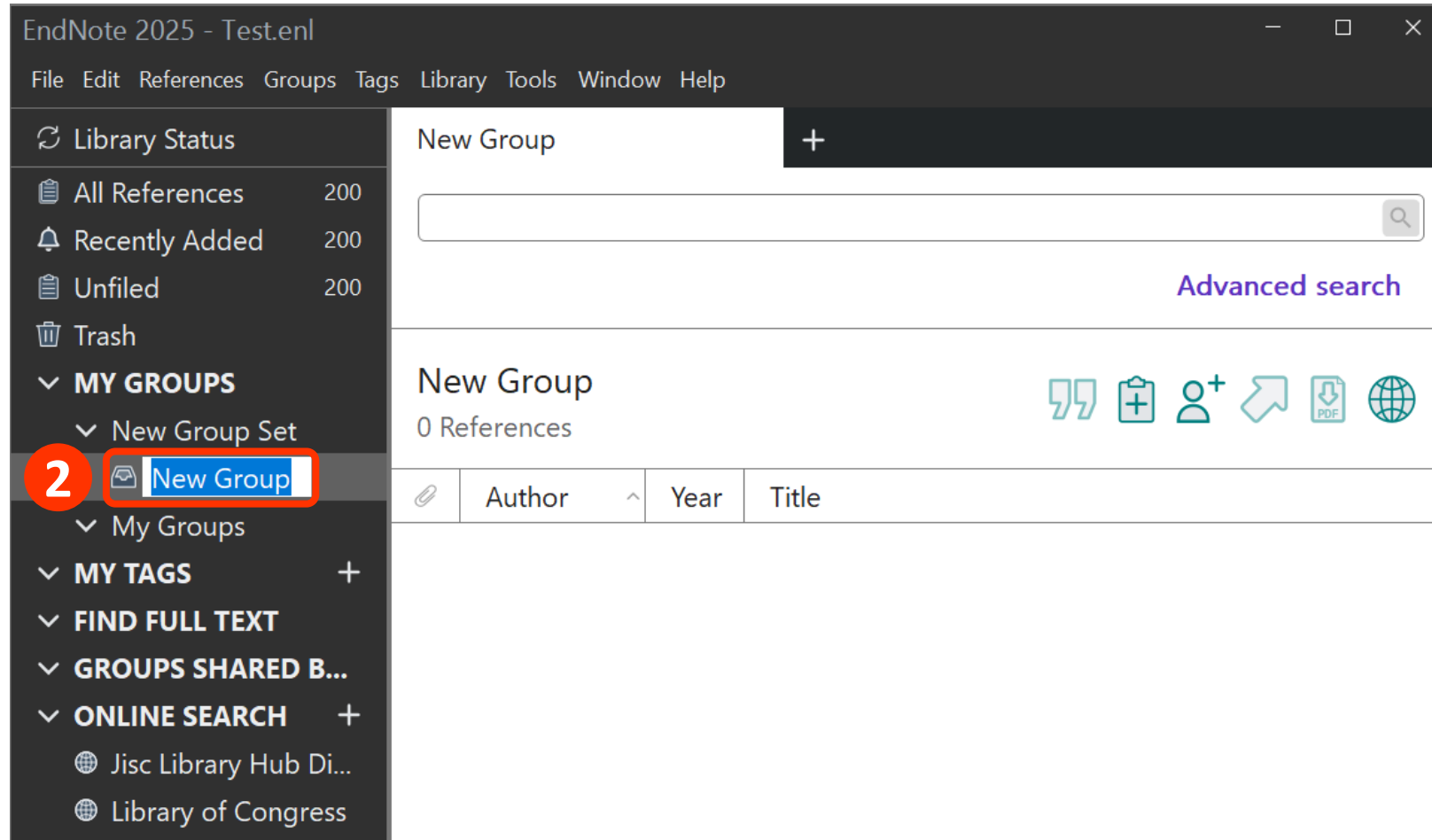


Custom Groups (1)



Creating a Custom Group

1. Go to **Groups > Create Group**
2. Enter a name for the custom group



Custom Groups (2)

Creating a Custom Group (cont.)

3. Add References to a custom group by **drag and drop**

EndNote 2025 - Test.enl

File Edit References Groups Tags Library Tools Window Help

Library Status

All References 200

Recently Added 200

Unfiled 200

Trash

MY GROUPS

New Group Set

New Group

My Groups

MY TAGS

FIND FULL TEXT

GROUPS SHARED B...

ONLINE SEARCH +

Jisc Library Hub Di...

Library of Congress

PubMed (NLM)

Utah St U

Web of Science Co...

All References

+

All References

200 References

Advanced search



	Author	Year	Title	Journal	Last Updated	Reference Type
3	Accorsi, E. ...	2022	Association between 3 Doses of mRNA COVID-19 Vaccine and Sympto...	JAMA	7/5/2025	Journal Article
	Acosta, J. N...	2022	Multimodal biomedical AI	Nature Medicine	7/5/2025	Journal Article
	Adisasmito,...	2022	One Health: A new definition for a sustainable and healthy future	PLoS Pathogens	7/5/2025	Journal Article
	Afgan, E.; ...	2022	The Galaxy platform for accessible, reproducible and collaborative bio...	Nucleic Acids R...	7/5/2025	Journal Article
	Agustí, A.; ...	2023	Global Initiative for Chronic Obstructive Lung Disease 2023 Report: GO...	European Respi...	7/5/2025	Journal Article
	Ahmad, E.; ...	2022	Type 2 diabetes	The Lancet	7/5/2025	Journal Article
	Al-Aly, Z.; ...	2022	Long COVID after breakthrough SARS-CoV-2 infection	Nature Medicine	7/5/2025	Journal Article
	Al-Khayri, J...	2022	Flavonoids as Potential Anti-Inflammatory Molecules: A Review	Molecules	7/5/2025	Journal Article
	Alkodaymi,...	2022	Prevalence of post-acute COVID-19 syndrome symptoms at different f...	Clinical Microbi...	7/5/2025	Journal Article
	Altarawneh...	2022	Effects of Previous Infection and Vaccination on Symptomatic Omicron ...	New England Jo...	7/5/2025	Journal Article
	Andrews, ...	2022	Covid-19 Vaccine Effectiveness against the Omicron (B.1.1.529) Variant	New England Jo...	7/5/2025	Journal Article
	Andrews, ...	2022	Duration of Protection against Mild and Severe Disease by Covid-19 Va...	New England Jo...	7/5/2025	Journal Article

Custom Groups (3)

Creating a Custom Group (cont.)

4. A custom group will be displayed as results

EndNote 2025 - Test.enl

File Edit References Groups Tags Library Tools Window Help

Library Status

All References 200

Recently Added 200

Unfiled 195

Trash

MY GROUPS

New Group Set

New Group 5

My Groups

MY TAGS +

FIND FULL TEXT

GROUPS SHARED B...

ONLINE SEARCH +

Jisc Library Hub Di...

Library of Congress

PubMed (NLM)

Utah St U

Web of Science Co...

New Group

+

New Group

5 References

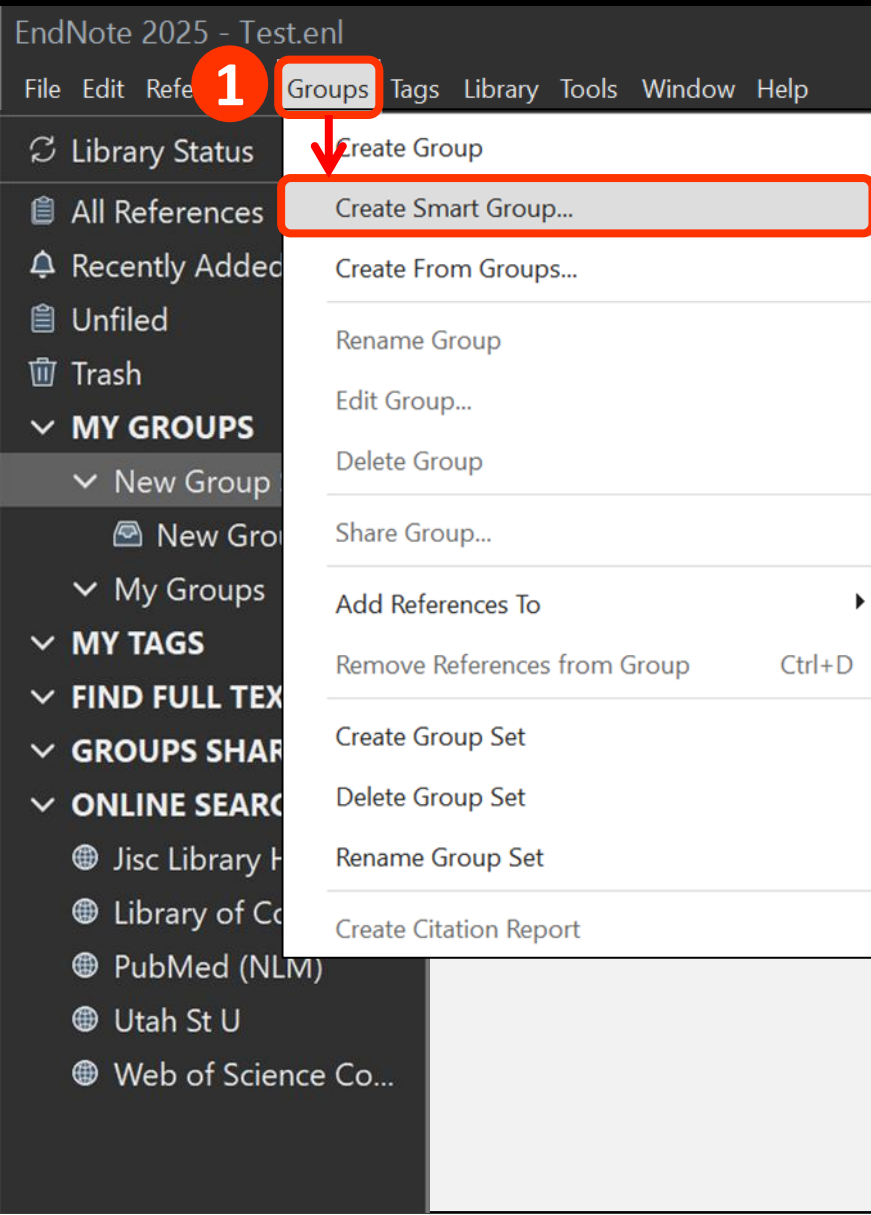
4

Advanced search



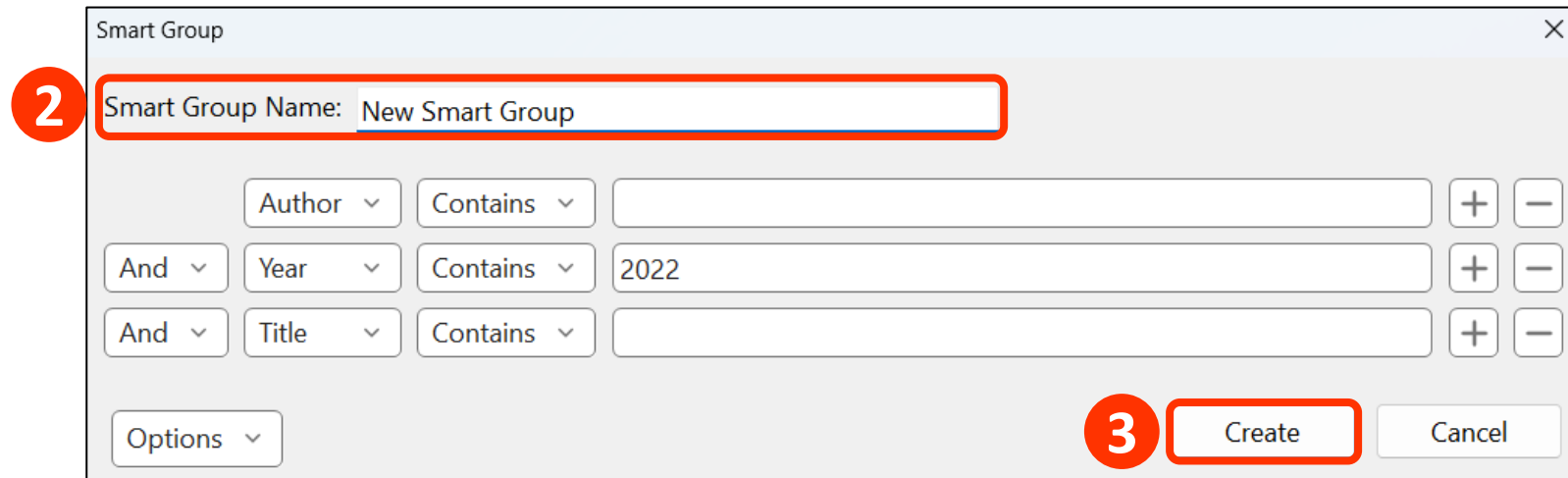
	Author	Year	Title	Journal	Last Updated	Reference Type
	Acosta, J. N...	2022	Multimodal biomedical AI	Nature Medicine	7/5/2025	Journal Article
	Adisasmito,...	2022	One Health: A new definition for a sustainable and healthy future	PLoS Pathogens	7/5/2025	Journal Article
	Afgan, E.; ...	2022	The Galaxy platform for accessible, reproducible and collaborative bio...	Nucleic Acids R...	7/5/2025	Journal Article
	Agustí, A.; ...	2023	Global Initiative for Chronic Obstructive Lung Disease 2023 Report: GO...	European Respi...	7/5/2025	Journal Article
	Ahmad, E.; ...	2022	Type 2 diabetes	The Lancet	7/5/2025	Journal Article

Smart Groups (1)



Creating a Smart Group

1. Go to **Groups > Create Smart Group...**
2. Enter a name for the new smart group
3. Set your search criteria, then click **Create**



Smart Groups (2)

Creating a Smart Group (cont.)

4. A smart group will be displayed as results

EndNote 2025 - Test.enl

File Edit References Groups Tags Library Tools Window Help

Library Status

All References 200

Recently Added 200

Unfiled 195

Trash

MY GROUPS

New Group Set

New Group 5

New Smart Group 152

My Groups

MY TAGS +

FIND FULL TEXT

GROUPS SHARED BY O...

ONLINE SEARCH +

Jisc Library Hub Discover

Library of Congress

PubMed (NLM)

Utah St U

Web of Science Core C...

New Smart Group

+

New Smart Group

152 References

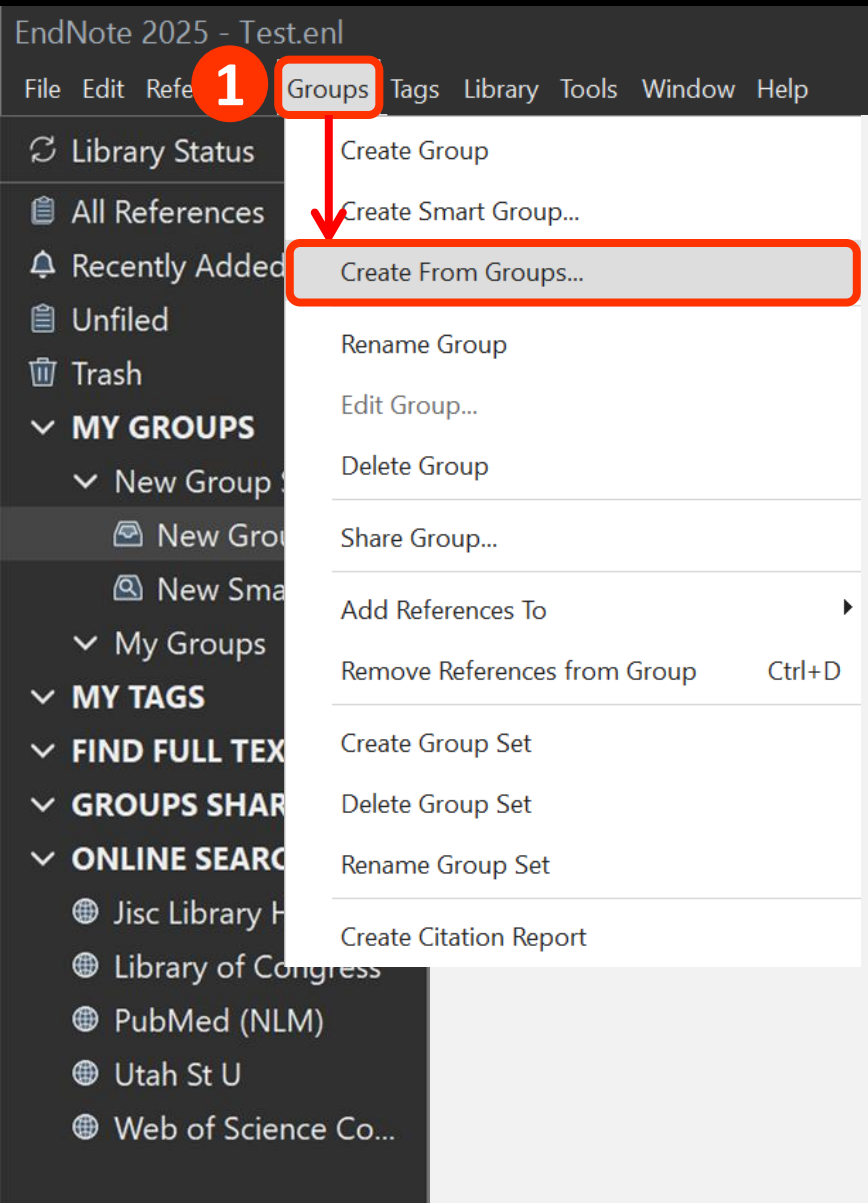
4

Advanced search



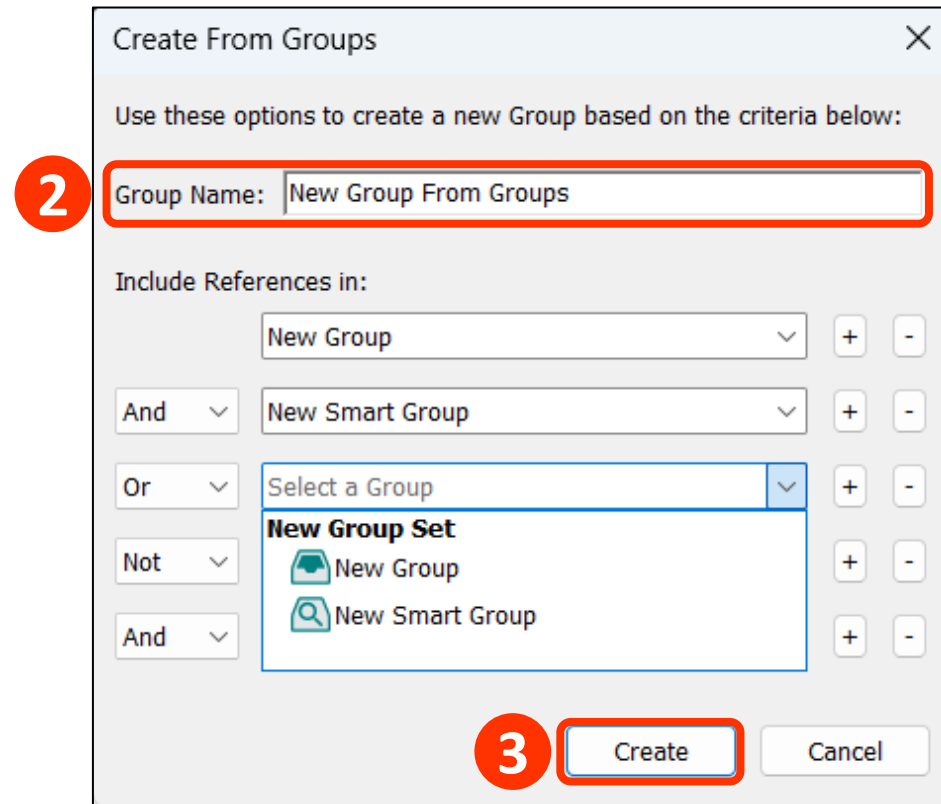
	Author	Year	Title	Journal	Last Updated	Reference Type
	Abbass, K.; ...	2022	A review of the global climate change impacts, adaptation, and sustaina...	Environmental S...	7/5/2025	Journal Article
	Accorsi, E. ...	2022	Association between 3 Doses of mRNA COVID-19 Vaccine and Sympto...	JAMA	7/5/2025	Journal Article
	Acosta, J. N...	2022	Multimodal biomedical AI	Nature Medicine	7/5/2025	Journal Article
	Adisasmito,...	2022	One Health: A new definition for a sustainable and healthy future	PLoS Pathogens	7/5/2025	Journal Article
	Afgan, E.; ...	2022	The Galaxy platform for accessible, reproducible and collaborative bio...	Nucleic Acids R...	7/5/2025	Journal Article
	Ahmad, E.; ...	2022	Type 2 diabetes	The Lancet	7/5/2025	Journal Article
	Al-Aly, Z.; ...	2022	Long COVID after breakthrough SARS-CoV-2 infection	Nature Medicine	7/5/2025	Journal Article
	Al-Khayri, J...	2022	Flavonoids as Potential Anti-Inflammatory Molecules: A Review	Molecules	7/5/2025	Journal Article
	Alkodaymi,...	2022	Prevalence of post-acute COVID-19 syndrome symptoms at different f...	Clinical Microbi...	7/5/2025	Journal Article
	Altarawneh...	2022	Effects of Previous Infection and Vaccination on Symptomatic Omicron ...	New England Jo...	7/5/2025	Journal Article
	Andrews, ...	2022	Covid-19 Vaccine Effectiveness against the Omicron (B.1.1.529) Variant	New England Jo...	7/5/2025	Journal Article
	Andrews, ...	2022	Duration of Protection against Mild and Severe Disease by Covid-19 Va...	New England Jo...	7/5/2025	Journal Article

Combination Groups (1)



Creating a Combination Group

1. Go to **Groups > Create From Groups...**
2. Enter a name for the combination group.
3. Select custom or smart groups to combine using AND, OR, NOT to include or exclude in the combined group set. Then click **Create**



Combination Groups (2)

Creating a Combination Group (cont.)

4. A Combination group will be displayed as results

EndNote 2025 - Test.enl

File Edit References Groups Tags Library Tools Window Help

Library Status

All References 200

Recently Added 200

Unfiled 195

Trash

MY GROUPS

New Group Set

New Group 5

New Group From Groups 4

New Smart Group 152

My Groups

MY TAGS +

FIND FULL TEXT

GROUPS SHARED BY OTHERS

ONLINE SEARCH +

Jisc Library Hub Discover

Library of Congress

PubMed (NLM)

Utah St U

Web of Science Core Collecti...

New Group From Groups

New Group From Groups

4 References

4

Advanced search



	Author	Year	Title	Journal	Last Updated	Reference Type
	Acosta, J. N...	2022	Multimodal biomedical AI	Nature Medicine	7/5/2025	Journal Article
	Adisasmito,...	2022	One Health: A new definition for a sustainable and healthy future	PLoS Pathogens	7/5/2025	Journal Article
	Afgan, E.; ...	2022	The Galaxy platform for accessible, reproducible and collaborative bio...	Nucleic Acids R...	7/5/2025	Journal Article
	Ahmad, E.; ...	2022	Type 2 diabetes	The Lancet	7/5/2025	Journal Article

Tags (1)

EndNote 2025 - Sample_Library_2025.enl

File Edit References Groups Tags Library Tools Window Help

Library Status

- All References 190
- Recently Added
- Unfiled 1
- Trash 2
- MY GROUPS
 - Avian Intelligence
 - Avian Cognition 33
- Chiroptera 27
- Echolocation 10
- Echolocation OR So... 13
- Sonar 8
- My Groups
 - Citation Report Exa... 122
 - Cognition-All 86
 - Open Access Articles 14
 - References to Update 2
- MY TAGS
 - Contact Author 2

All References

190 References

Author	Year	Title
Aguilera-Alcala, N.; ...	2020	Role of scavengers in providing no...
Aizpurua, O.; Alberdi, ...	2016	Fishing Technique of Long-Fingered B...
Allen, Glover M.	2004	Bats: biology, behavior, and folklore
Arnett, E. B.; Hein, C. D.; ...	2013	Evaluating the Effectiveness of an Ultrasc...
Avila-Flores, R.; Medelli...	2004	Ecological, taxonomic, and physiological
Bat Conservation Intern...	2008	Bat Conservation International
Binfield, Peter	2008	At PLoS ONE we're batty about bats
Bird, C. D.; Emery, N. J.	2009	Insightful problem solving and creative t...
Blanco, G.; Cuevas, J. ...	2019	A shot in the dark: Sport hunting of c...
Brinklov, S.; Kalko, E. K. ...	2009	Intense echolocation calls from two 'whis...
Brucks, D.; von Bayer...	2020	Parrots Voluntarily Help Each Other ...
Bundell, S.	2020	The parrots that understand probabi...
Chiu, C.; Moss, C. F.	2007	The role of the external ear in vertical sou...

1. Right-click on a reference and select **Manage Tags**

- New Reference Ctrl+N
- Edit Reference Ctrl+E
- Edit Reference in New Window Ctrl+Shift+E
- Copy References To
- Copy Formatted Reference Ctrl+K
- E-mail Reference
- Move References to Trash Ctrl+D
- Add References To
- Remove References From Group
- Manage Tags
- Cut
- Copy
- Paste
- Find Full Text
- Authenticate...
- Find Reference Updates
- OpenURL Link
- Open URL
- Mark as Read
- Rating
- Open in New Tab

Advanced search

Reference Type

- Encyclopedia
- Journal Article
- Journal Article
- Book
- Journal Article
- Journal Article
- Web Page
- Blog
- Journal Article
- Journal Article
- Journal Article
- Journal Article
- Journal Article

51

Tags (2)

EndNote 2025 - Sample_Library_2025.enl

File Edit References Groups Tags Library Tools Window Help

Library Status

- All References 190
- Recently Added
- Unfiled 1
- Trash 2
- MY GROUPS
 - Avian Intelligence
 - Avian Cognition 33
 - Corvids 24
 - Corvids & Parrots 6
 - Parrots 28
 - Bats
 - Chiroptera 27
 - Echolocation 10
 - Echolocation OR So... 13
 - Sonar 8
 - My Groups
 - Citation Report Exa... 122
 - Cognition-All 86
 - Open Access Articles 14
 - References to Update 2
- MY TAGS
 - Contact Author 2

All References

Manage Tags

Current tags for Aguilera-Alcala, 2020 #2450

- Contact Author
- Reading: High Priority

Available tags

- Need Abstract
- Need to Buy
- Reading: Suggested

Create Tag

New Tag

- Red
- Orange
- Yellow
- Green
- Blue
- Purple
- Gray

Create Tag

2. Create the new tag, name it and choose a color

3. Select tag you want to add to the reference

4. Click OK

OK Cancel

Author	Year	Title	Journal	Date	Type
Aguilera-Alcala, 2020	2020	Parrots Voluntarily Help Each Other ...	Curr Biol	27/02/2025	Journal Article
Aizpurua, 2020	2020	The parrots that understand probabi...	Nature	27/02/2025	Journal Article
Allen, G.	2007	The role of the external ear in vertical sou...	J Acoust Soc Am	27/02/2025	Journal Article
Arnett, E.	2007				
Avila-Flor	2007				
Bat Conse	2007				
Binfield, P	2007				
Bird, C. D.	2007				
Blanco, C	2007				
Brinklov, S	2007				
Brucks, D.; von Bayer...	2020	Parrots Voluntarily Help Each Other ...	Curr Biol	27/02/2025	Journal Article
Bundell, S.	2020	The parrots that understand probabi...	Nature	27/02/2025	Journal Article
Chiu, C.; Moss, C. F.	2007	The role of the external ear in vertical sou...	J Acoust Soc Am	27/02/2025	Journal Article

Tags (3)

EndNote 2025 - Sample_Library_2025.enl

File Edit References Groups Tags Library Tools Window Help

My Tags +

Advanced search

My Tags 45 References

5. Reference tags will be displayed as results

Author	Year	Title	Journal	Last Updated	Reference Type
Aguilera-Alcala, N.; ...	2020	Role of scavengers in providing no...	Ecological Indic...	27/02/2025	Journal Article
Brucks, D.; von Bayer...	2020	Parrots Voluntarily Help Each Other ...	Curr Biol	27/02/2025	Journal Article
Bundell, S.	2020	The parrots that understand probab ...	Nature	27/02/2025	Journal Article
Clayton, Nicola S.; Emer...	2009	What Do Jays Know About Other Minds ...	Neurobiology of ...	27/02/2025	Book Section
de Oya, N. J.; Escriban...	2019	Current Progress of Avian Vaccines ...	Vaccines	27/02/2025	Journal Article
EUROBATS Secretariat,	2004	EUROBATS: The Agreement on the Cons...		27/02/2025	Web Page
Halgren, T. A.; Pepper...	1975	Computational Evidence for a Stable...	Journal of the A...	27/02/2025	Journal Article
Hartle, D.	2008	Alex & Me: How a Scientist and a Parrot ...	Library Journal	10/03/2025	Journal Article
Mikkelsen, J.	2017	Of Parrots and Crows Bidil and Hazi...	Comparative St...	27/02/2025	Journal Article
Pailian, H.; Carey, S. E...	2020	Age and Species Comparisons of Vis...	Scientific Reports	27/02/2025	Journal Article
Patterson, D. K.; Pepp...	1997	How parrots talk: Insights based on ...	Physiology and ...	27/02/2025	Book
Pepperberg, I.	2010	An Avian Model for Language Evolu...	Evolution of La...	27/02/2025	Book
Pepperberg, I. M.	1983	Cognition in the African Grey Parrot...	Animal Learnin...	27/02/2025	Journal Article
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OPEN Rapid alignment-free bacteria identification via optical scattering with LEDs and YOLOv8

Suwat Romphosri¹, Dakrong Pissuwan¹, Nungnit Wattanavichean¹, Pakpoom Buabthong² & Tanant Waritanant¹

Rapid and accurate bacterial identification is essential for timely treatment of infections like sepsis. While traditional methods are reliable, they lack speed, and advanced molecular techniques often suffer from cost and complexity. The bacterial detection technology based on optical scattering system offers a rapid, label-free alternative but traditionally relies on complex lasers and analysis. Our enhanced approach utilizes RGB light emitting diodes (LEDs) as the light source. Three diffraction images of bacterial colonies from different LED colors are separately captured by a USB camera and combined using an image registration algorithm to enhance image sharpness. Our approach utilizes an object detection model, i.e., YOLOv8, for analysis achieving high-accuracy differentiation between bacterial strains. We demonstrate the effectiveness of this approach, achieving an average accuracy of 97% (mAP50 of 0.97), including accurate discrimination of closely related strains and the significant pathogen *Staphylococcus aureus* MRSA 1320. Our enhancement offers advantages in affordability, usability, and seamless integration into existing workflows, providing an alternative for rapid bacterial identification.

Keywords Bacterial detection, Optical scattering, Machine learning, YOLOv8s, Spatial coherence

Rapid and precise bacterial identification is pivotal in modern healthcare for numerous reasons. Firstly, it dramatically enhances treatment efficacy in critical conditions such as sepsis, where every hour count¹. Timely and accurate identification of the causative bacterial agent enables clinicians to promptly administer the most effective antibiotics, thereby significantly improving patient survival rates. Furthermore, the ability to identify bacteria quickly plays a vital role in combating antibiotic resistance. By reducing the need for broad-spectrum antibiotics, which are often used when the causative agent is unknown, targeted therapy based on precise bacterial identification helps preserve the efficacy of these critical drugs. This targeted approach also minimizes the risk of antibiotic misuse, a major factor in the development of antibiotic-resistant strains of bacteria². Economically, rapid bacterial identification can lead to significant healthcare savings. By enabling quicker diagnosis and treatment, it can reduce the length of hospital stays and the associated costs³. This efficiency not only benefits patients but also helps healthcare systems manage resources more effectively. In terms of patient safety, rapid and precise identification minimizes the risk of adverse reactions associated with inappropriate antibiotic use. In summary, effective bacterial identification is a fundamental aspect of contemporary healthcare, playing a critical role in improving clinical outcomes, preventing the spread of infections, reducing healthcare costs, enhancing patient safety, and aiding the global fight against antibiotic resistance.

Key Takeaway

This study introduced an enhanced bacteria identification technique using LEDs and YOLOv8, simplifying the imaging setup and analysis while maintaining high accuracy and cost-effectiveness.

Additional topics discussed in the document are:

- LED technology in bacterial detection
- YOLOv8 model performance comparison
- Impact of culture media on bacterial imaging

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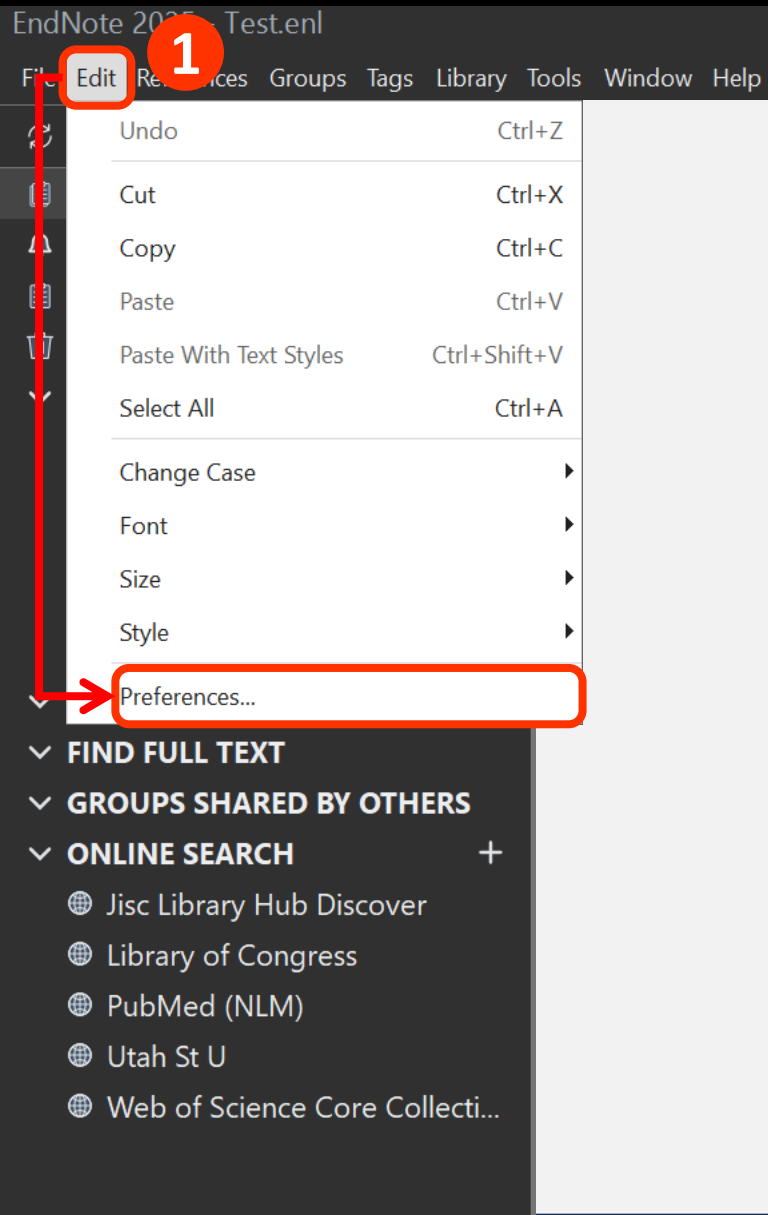


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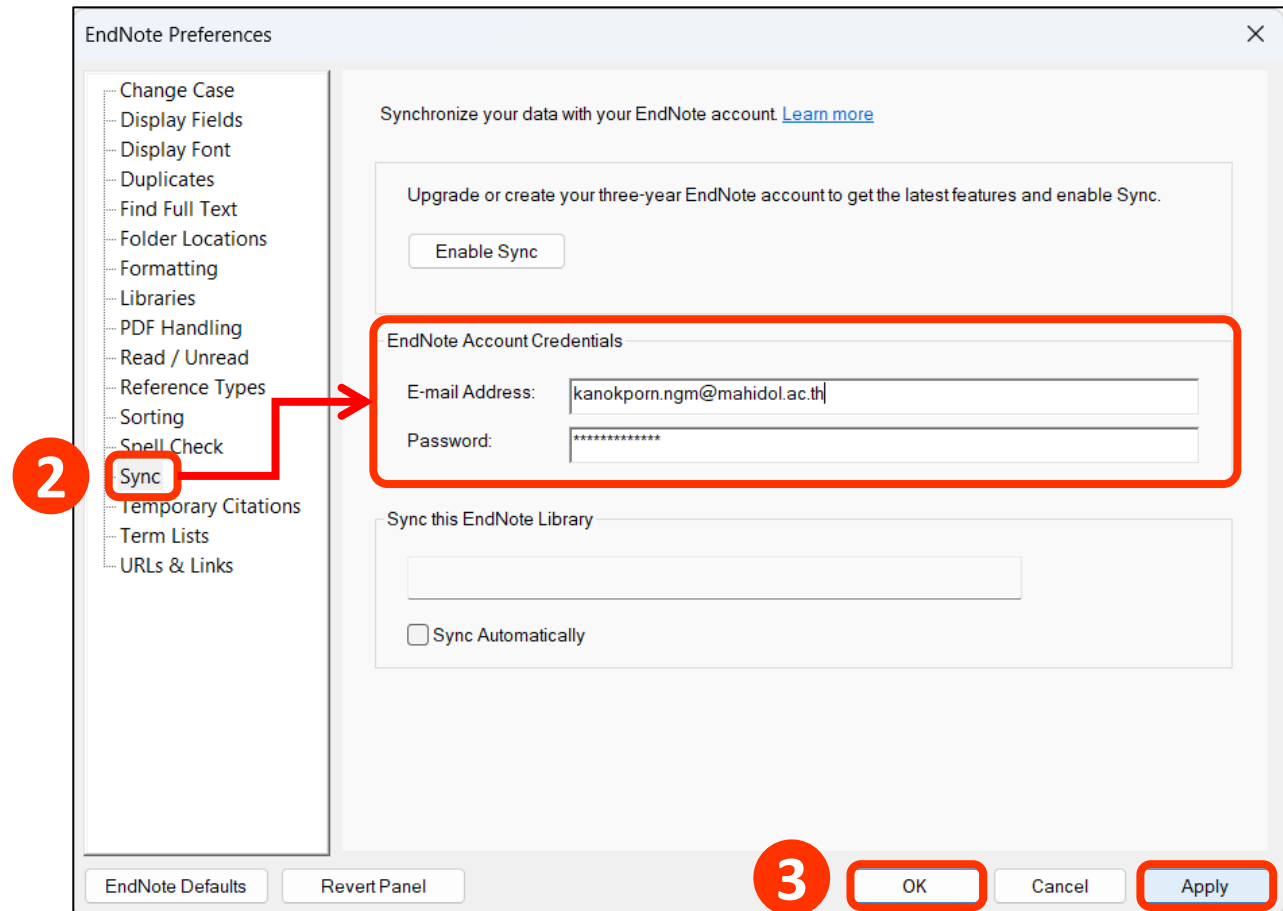
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OPEN Rapid alignment-free bacteria identification via optical scattering with LEDs and YOLOv8

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Various bacterial detection techniques have both specific benefits and drawbacks. Traditional culture methods are dependable but slow, often requiring several days for conclusive results. Spectroscopic techniques such as Near-infrared (NIR) and Raman spectroscopy specify macromolecular composition of bacterial cells, such as nucleic acids, proteins, carbohydrates, and fatty acids, providing distinct absorption spectra. However, the challenge in microbial spectroscopy lies in the fact that most microorganisms have similar chemical compositions, resulting in very similar spectra. Polymerase Chain Reaction (PCR) is utilized to detect bacterial pathogens by targeting specific DNA sequences with specific primers. Higher sensitivity is offered by PCR compared to traditional culture and staining methods, and the process is completed within a few hours. However, certain drawbacks are associated with PCR: its specificity may be lower, which increases the risk of false positives. Additionally, because specific primers are necessary for different microorganisms, bacterial identification requires the development of specific primers for each target.

4. Key Takeaway will be displayed as results

Key Takeaway

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