



# **Mapping Research Articles with Mendeley and VOSviewer**

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Revised:			Approved by:

This SOP uses the following programs:

- [Mendeley](#) (Free) – Manages bibliographic data.
- [VOSviewer](#) (Free) – Maps bibliographic data.

Download both programs to perform the procedure.

## DOWNLOADING CITATION INFORMATION FROM ARTICLES

1. Go to [ScienceDirect webpage](#).
2. Register on Science Direct (Free) to enable the option to export article information.
3. Determine the desired keyword(s) for the article search.

Can use Booleans to filter unwanted articles.

- **a AND b** – Include all articles that contain both the “a” and “b” keyword.  
e.g., Raman AND Review results in all articles that mention both “Raman” and “Review” together.
- **a NOT b** – Include all articles that contain “a” and excludes all articles that contain “b”.  
e.g., Raman NOT Review results in all articles that mention “Raman” while excluding all that mention “Review”.
- **a OR b** – Include all articles that contain “a” and “b” separately or together.  
e.g., Raman OR Review results in all articles that mention “Raman” alone, “Review” alone, or both “Raman” and “Review” together.

4. Scroll to the bottom of the results and select “100” results per page option.

Research article  
25 [Differential of cholangiocarcinoma disease using Raman sp](#)  
Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 5  
Joanna Depciuch, Magdalena Parlinska-Wojtan, ... Zozan Guleken  
[Abstract](#) [Export](#)

Display: [25](#) | [50](#) | [100](#) results per page

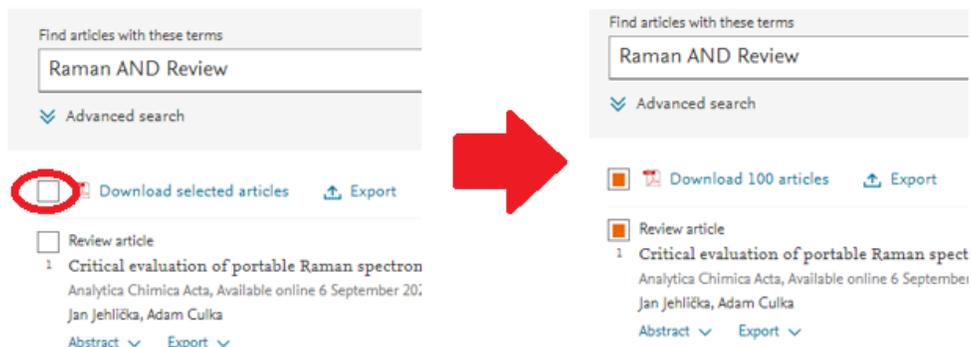


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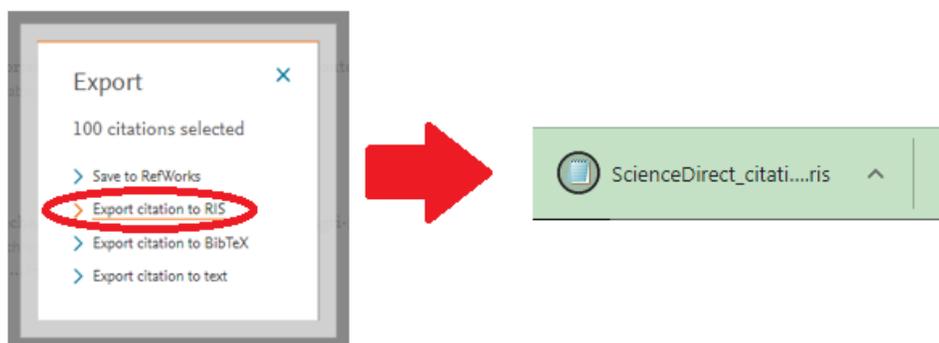
5. **Scroll** up to the top of the results and select the white box with black outline at the left of “Download selected articles”.



6. **Select** “Export” at the right of “Download 100 articles”.

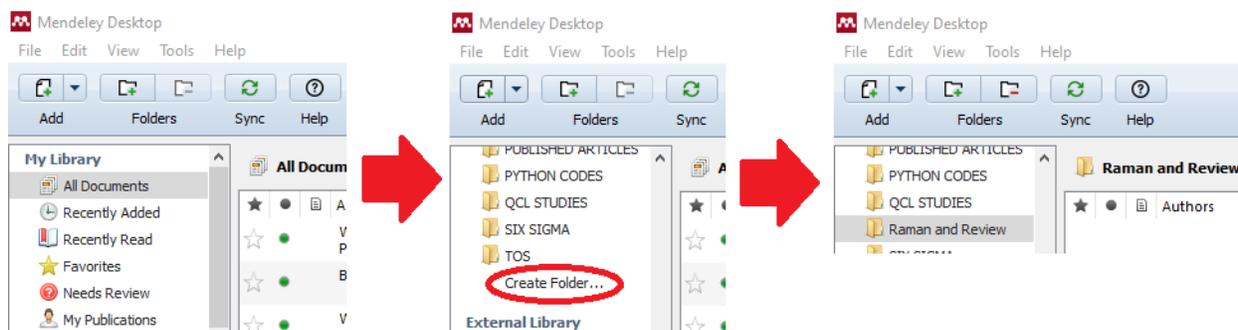


7. **Select** “Export citation to RIS”.



## RE-FILTER AND MERGE INFORMATION IN ONE FILE

1. **Open** Mendeley program.
2. **Create** folder going to the “My Library” section and scroll down and click the “Create Folder...” option.

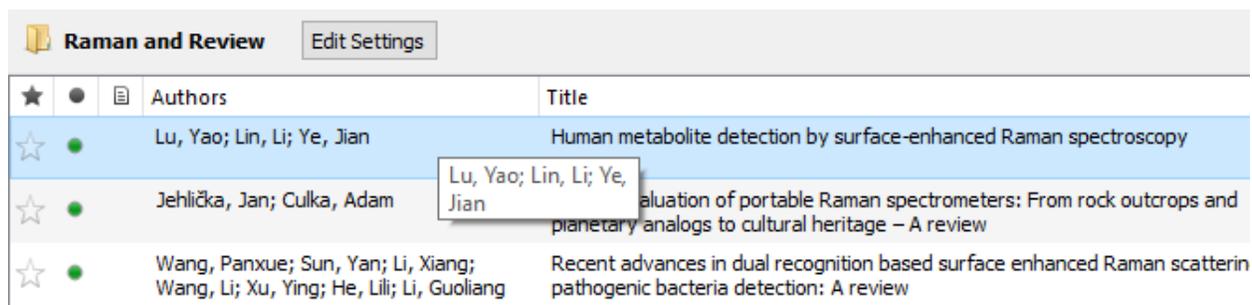


3. **Drag** all .ris files exported from Science Direct.



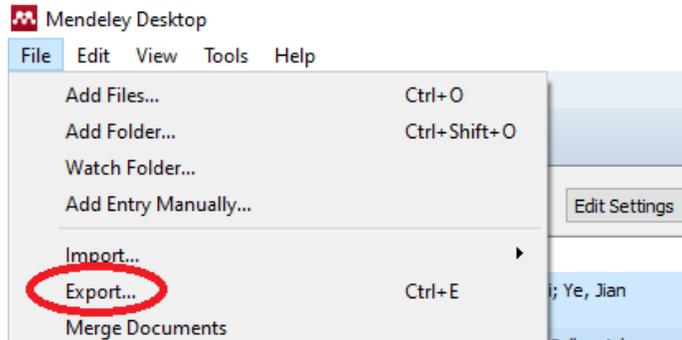
4. **Eliminate** articles that are not of interest.
  - a. Eliminate just by title.
  - b. Eliminate reading abstract.

5. **Left** click on one article.

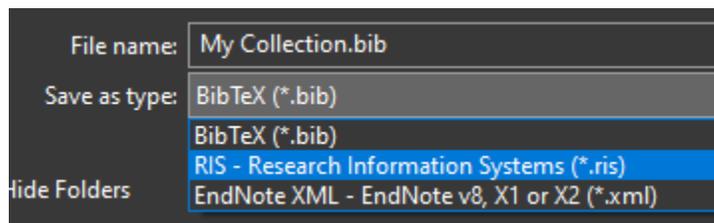


6. **Select** all articles in folder by typing Ctrl+A.

7. **Export** all files by going to File/Export...

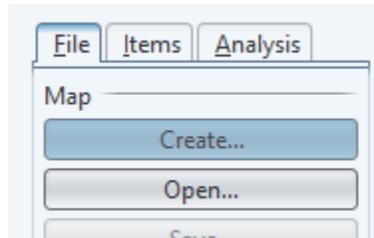


8. **Save** new file in (\*.ris) type.

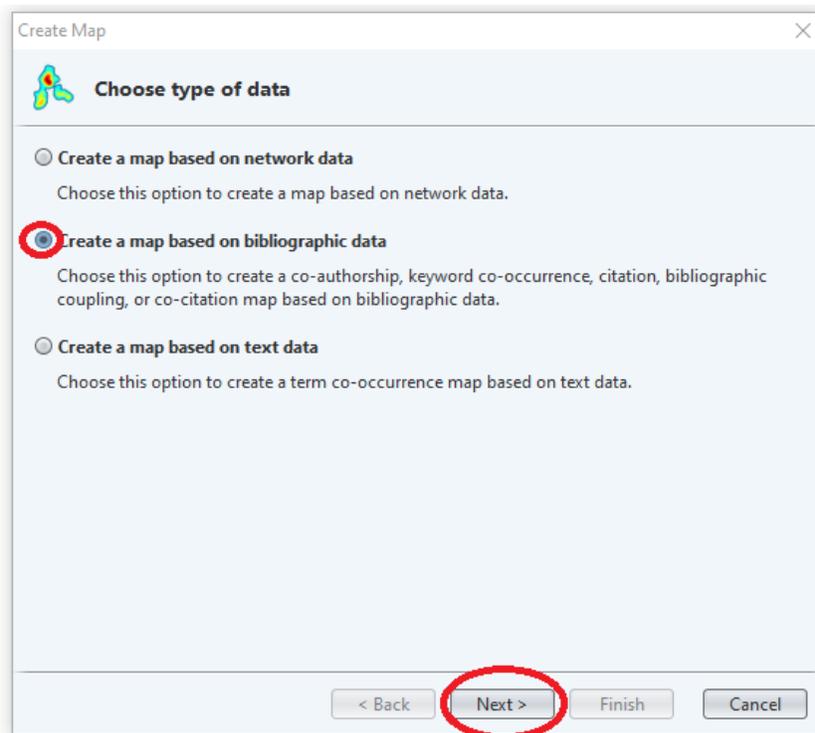


## MAP KEYWORDS OR AUTHORS OF ARTICLES IN VOSviewer

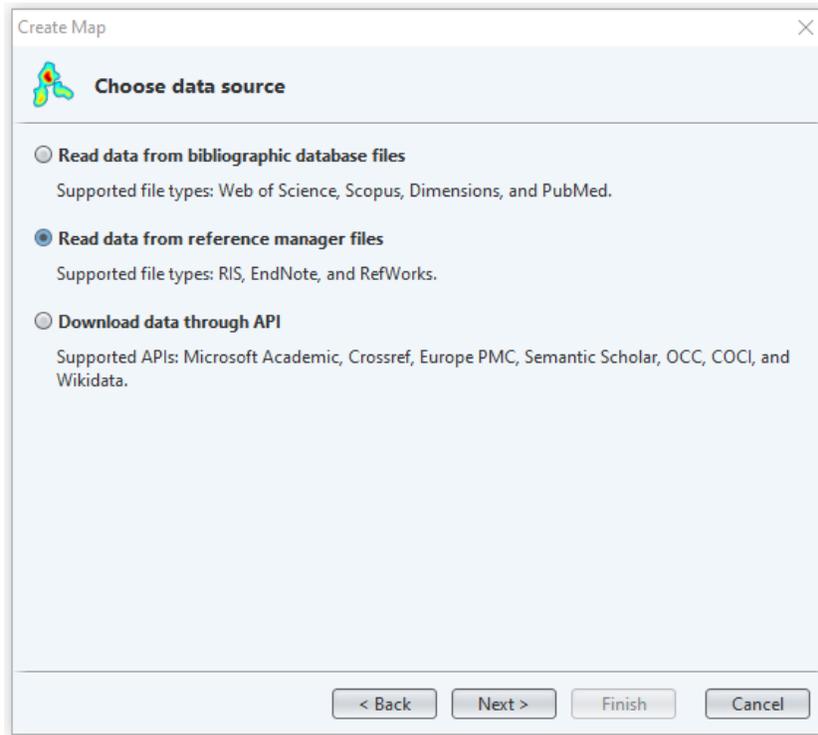
1. **Open** VOSviewer program.
2. **Create** map by going to the File section / Create...



3. **Create** map based on bibliographic data and click "Next >".



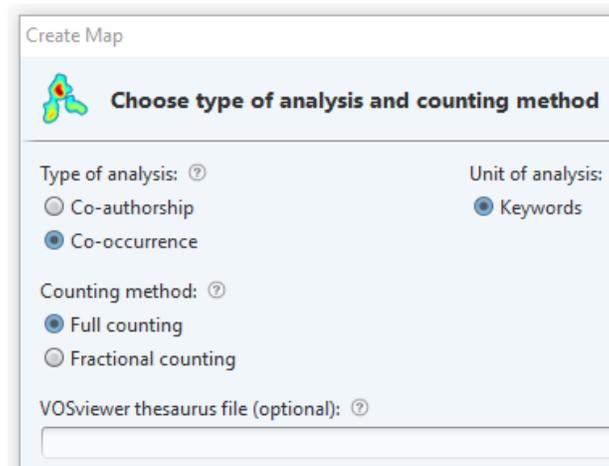
4. Read data from reference manager files and click “Next >”.



5. **Browse** and upload (\*.ris) file created from Mendeley and click “Next >”.

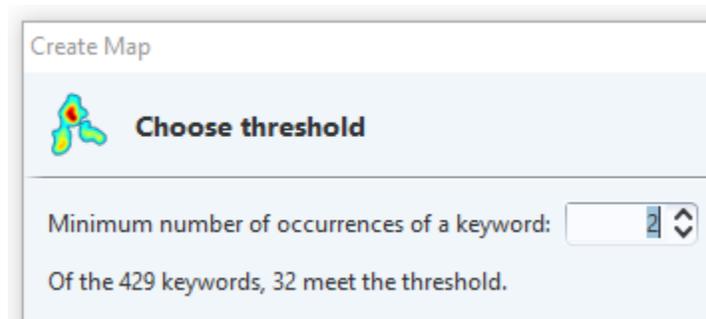


6. **Choose** to map keywords by selecting Type of analysis: Co-occurrence and Counting method: Full counting. Click “Next >”.



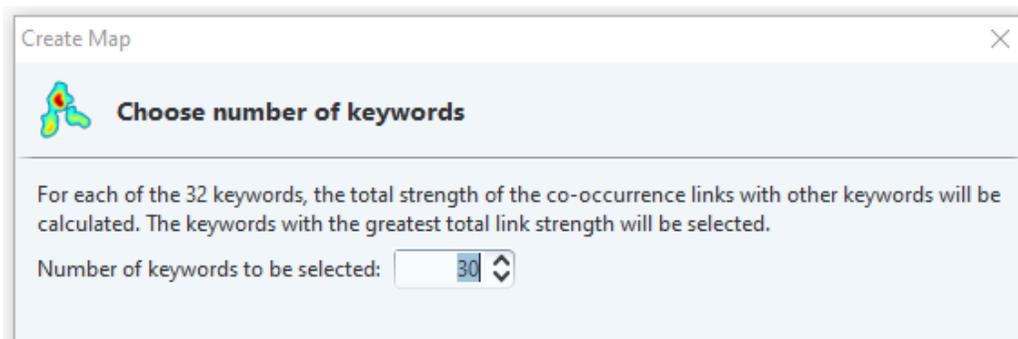
The screenshot shows a dialog box titled "Create Map" with a sub-header "Choose type of analysis and counting method". It contains two columns of radio button options. The first column, "Type of analysis:", has "Co-occurrence" selected. The second column, "Unit of analysis:", has "Keywords" selected. Below these is a "Counting method:" section with "Full counting" selected. At the bottom, there is a text input field for "VOSviewer thesaurus file (optional):".

7. **Choose** the minimum number of occurrences of a keyword. Ideally, the amount that gives 30-40 keywords that meet the threshold.



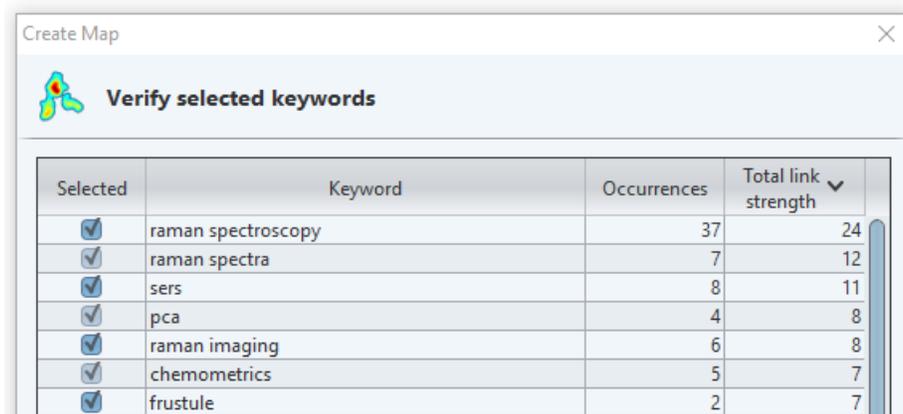
The screenshot shows a dialog box titled "Create Map" with a sub-header "Choose threshold". It features a spin box for "Minimum number of occurrences of a keyword:" with the value "2" displayed. Below the spin box, it states "Of the 429 keywords, 32 meet the threshold."

8. **Choose** the number of keywords to stay after the threshold.



The screenshot shows a dialog box titled "Create Map" with a sub-header "Choose number of keywords". It contains explanatory text: "For each of the 32 keywords, the total strength of the co-occurrence links with other keywords will be calculated. The keywords with the greatest total link strength will be selected." Below this text is a spin box for "Number of keywords to be selected:" with the value "30" displayed.

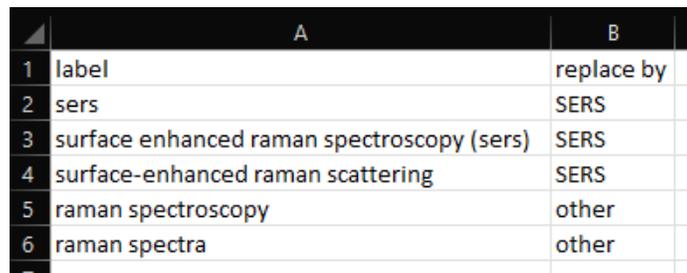
9. Eliminate keywords that are not relevant to the desire scope.



The screenshot shows a window titled "Create Map" with a sub-header "Verify selected keywords". Below the header is a table with the following data:

Selected	Keyword	Occurrences	Total link strength
<input checked="" type="checkbox"/>	raman spectroscopy	37	24
<input checked="" type="checkbox"/>	raman spectra	7	12
<input checked="" type="checkbox"/>	sers	8	11
<input checked="" type="checkbox"/>	pca	4	8
<input checked="" type="checkbox"/>	raman imaging	6	8
<input checked="" type="checkbox"/>	chemometrics	5	7
<input checked="" type="checkbox"/>	frustule	2	7

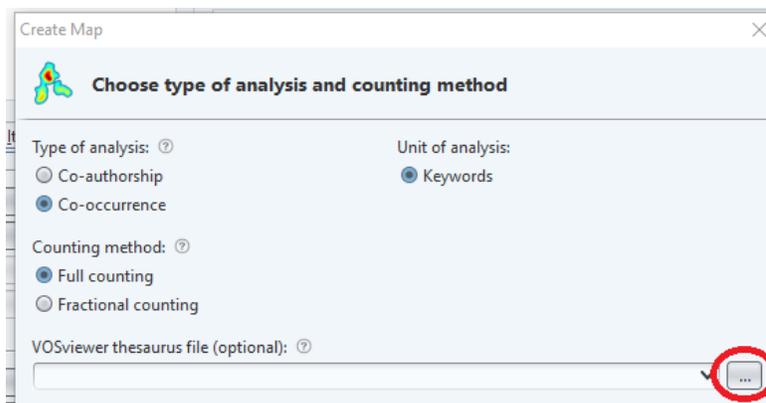
10. **[OPTIONAL]** If keywords are redundant (e.g., SERS, surface enhanced raman spectroscopy (sers), and surface-enhanced raman scattering), **Create** thesaurus file.
- Create** excel file.
  - Name** cell A1 "label" and B1 "replace by".
  - Write** keyword to rename on the "label" column.
  - Write** the keyword name you want for each keyword on the "label" column.
  - Write** keywords that were eliminated on step 9 and rename as "other".



The screenshot shows an Excel spreadsheet with two columns, A and B. The data is as follows:

	A	B
1	label	replace by
2	sers	SERS
3	surface enhanced raman spectroscopy (sers)	SERS
4	surface-enhanced raman scattering	SERS
5	raman spectroscopy	other
6	raman spectra	other

- Save** file as Text (tab delimited) (\*.txt).
- Go** "< Back" to "Choose type of analysis and counting method" and upload thesaurus file. Click "Next >".



The screenshot shows a dialog box titled "Create Map" with the sub-header "Choose type of analysis and counting method". It contains the following options:

- Type of analysis:
  - Co-authorship
  - Co-occurrence
- Unit of analysis:
  - Keywords
- Counting method:
  - Full counting
  - Fractional counting
- VOSviewer thesaurus file (optional): [Text field with a red circle around the file selection button]

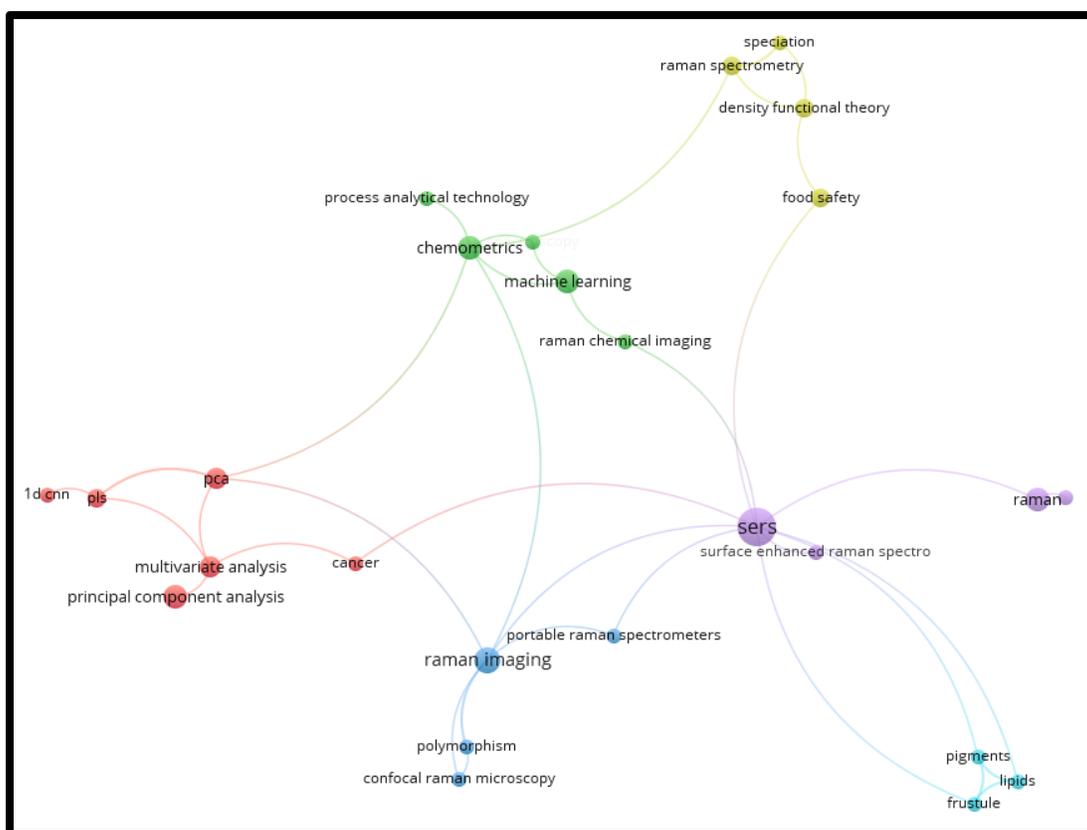
- Repeat** steps 7 to 9 and eliminate "other" keyword.

11. **Create** map by clicking “Finish”.

12. **[OPTIONAL]** if there are keywords that are not connected, choose “YES” if you want to eliminate unconnected keywords or “NO” to map the unconnected keyword.

- Choose “NO” if analysis of why it does not connect will be performed. It can be a source of study due to lack of connections.
- Choose “YES” if the analysis of step 12-a is not desired, choose “YES”.

### 13. Resulting Map



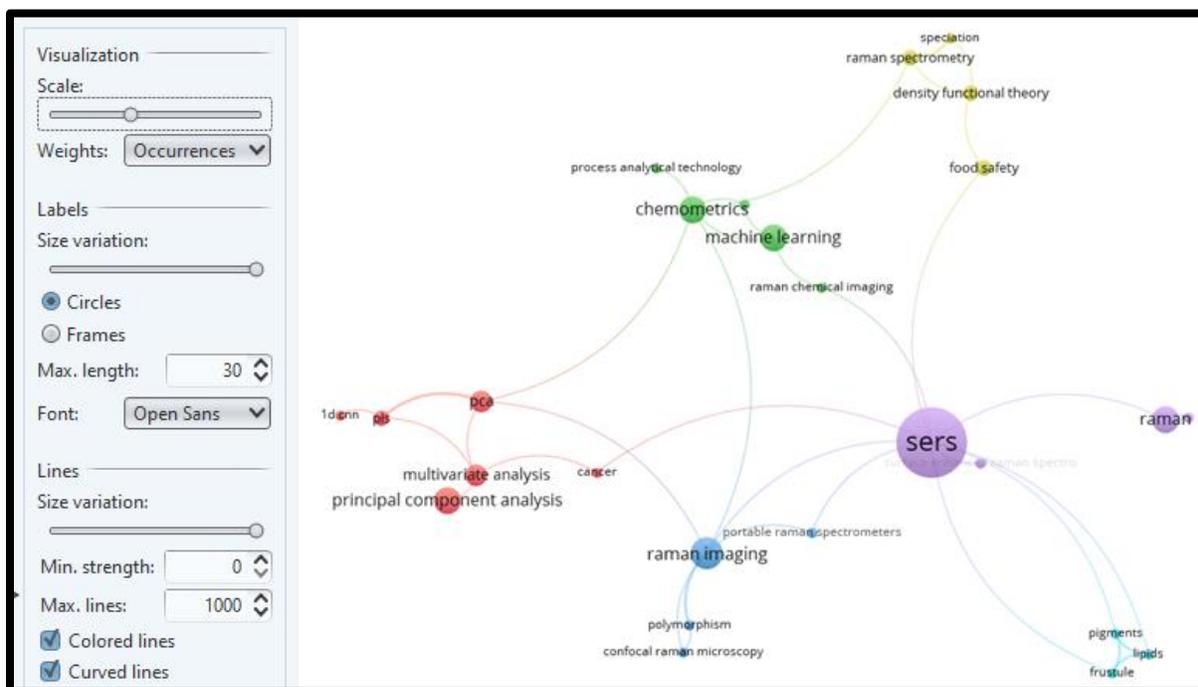
**Circle** – Keyword obtained from articles after assigning a specific threshold.

**Lines** – Connection between keyword “a” and “b”.

**Circle Size** – Proportional to number of articles where the keyword appears.

**Line Size** – Proportional to number of articles where both keyword “a” and “b” appear.

14. Visualize proportions by varying Scale, Labels and Lines size variation sliders.



15. Perform author map in articles by choosing “co-authorship” in step 6 and following the same procedure (replace keyword for author in the steps).

Advisor Signature

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Co-Advisor Signature

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