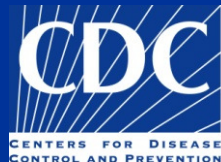


Advanced Tools



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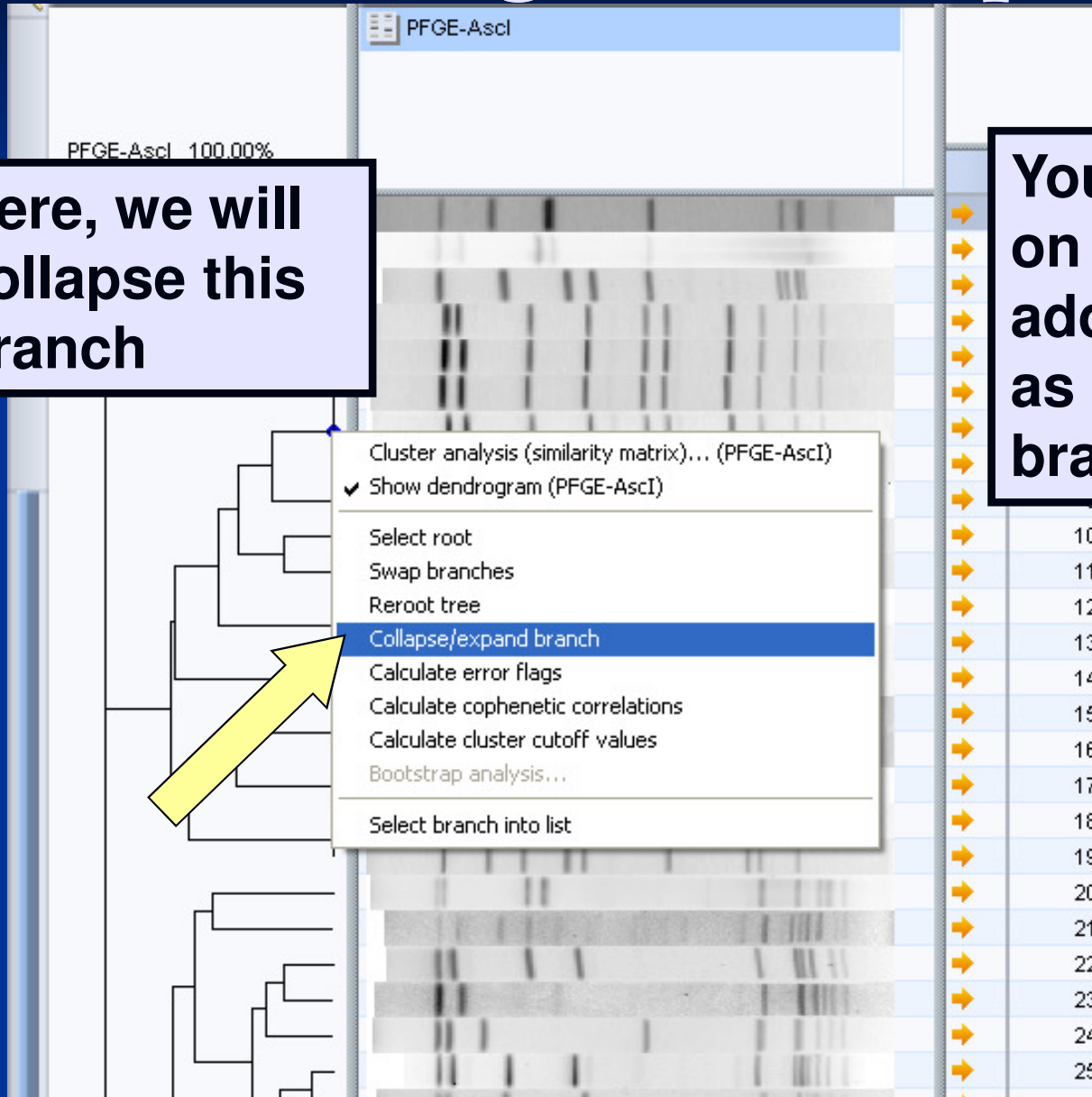
Overview

- Advanced options with dendrograms
- Advanced options with comparisons
- Advanced options with groups
- Advanced Queries
- Examples of advanced queries
- Plugins

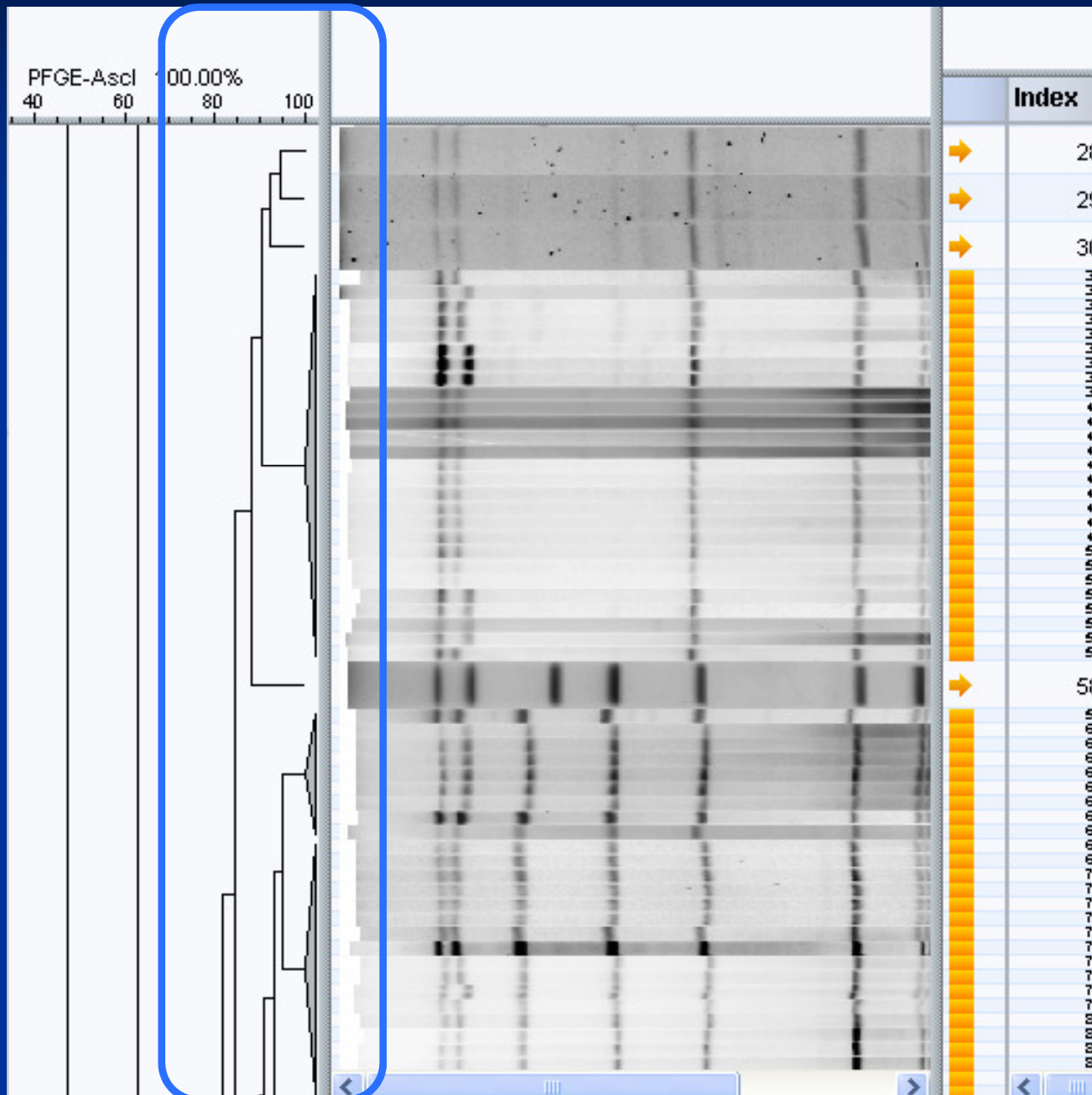
Dendrograms: collapse branches

Here, we will collapse this branch

You can also right-click on the branches for additional options, such as to collapse or expand a branch

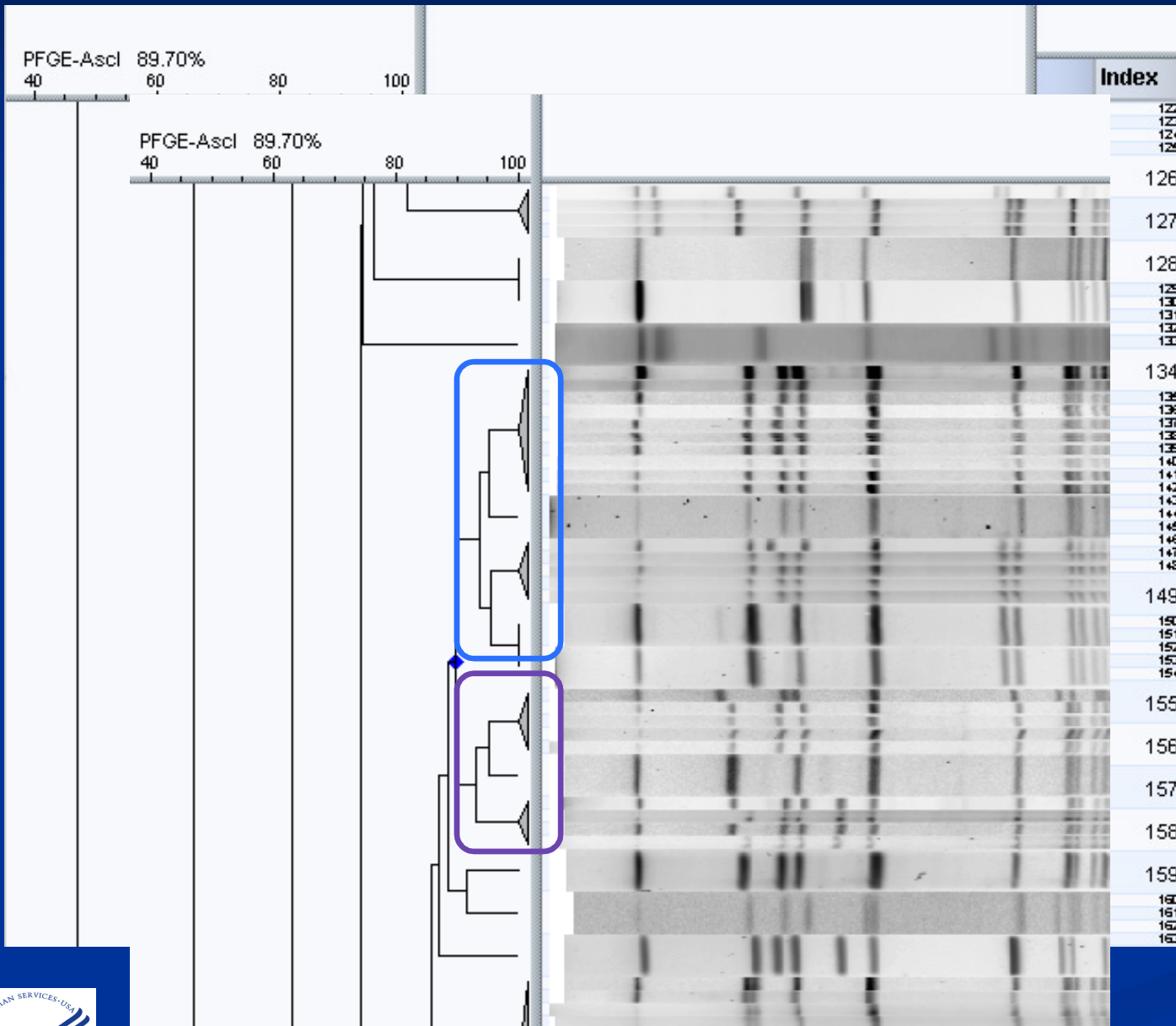


Dendrograms: collapse branches



When multiple branches have been collapsed, you can see more of the dendrogram on one page

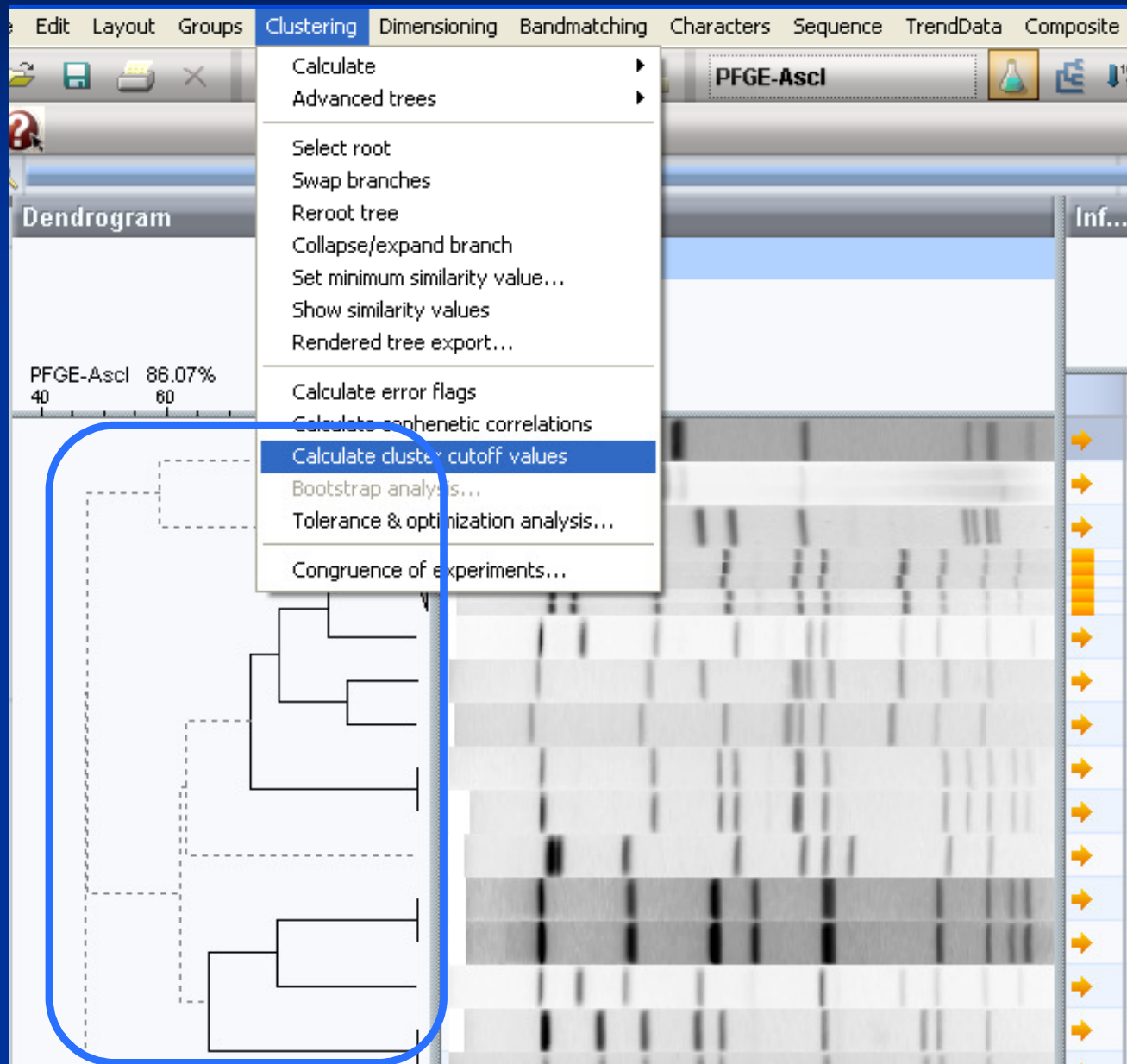
Dendrograms: swap branches



If you would rather clusters be switched around in the dendrogram, right-click on the node and select “Swap branches”

Now these branches have swapped places

Dendrograms: cluster cutoffs



To quickly view clusters, select **Clustering** → **“Calculate cluster cutoff values”**

Solid lines indicate clusters and **dashed lines** link different clusters

Dendrograms: similarity matrix

Show image
 Show bands
 Show densitometric curves
 Show metrics scale
 Brightness & contrast...

Zoom in Ctrl+Page Up
 Zoom out Ctrl+Page Down
 Stretch (X dir) Ctrl+Shift+Page Up
 Compress (X dir) Ctrl+Shift+Page Down

Show dendrogram
 Show matrix
 Show similarity values
 Show matrix rulers
 Similarity shades...
 Show distances

Use original keys
 Use group numbers as key
 Use field as key

0	20	40	60	80															
100	75.0	62.5	47.1	47.1	47.1	47.1	47.1	47.1	37.5	37.5	55.6	55.6	37.5	37.5	37.5	37.5	37.5	37.5	37.5
75.0	100	55.6	63.2	52.6	52.6	63.2	63.2	52.6	55.6	33.3	70.0	60.0	44.4	44.4	44.4	44.4	44.4	44.4	55.6
62.5	55.6	100	42.1	42.1	42.1	42.1	42.1	42.1	44.4	44.4	60.0	60.0	55.6	55.6	55.6	55.6	55.6	55.6	44.4
47.1	63.2	42.1	100	100	100	100	100	80.0	73.7	84.2	76.2	76.2	73.7	63.2	63.2	63.2	63.2	63.2	63.2
47.1	52.6	42.1	100	100	100	100	100	90.0	73.7	84.2	76.2	76.2	63.2	63.2	63.2	63.2	63.2	63.2	73.7
47.1	52.6	42.1	100	100	100	100	100	90.0	73.7	84.2	76.2	76.2	63.2	63.2	63.2	63.2	63.2	63.2	73.7
47.1	63.2	42.1	100	100	100	100	100	90.0	73.7	73.7	76.2	76.2	63.2	63.2	63.2	63.2	63.2	63.2	73.7
47.1	63.2	42.1	100	100	100	100	100	80.0	73.7	84.2	76.2	76.2	63.2	63.2	63.2	63.2	63.2	63.2	73.7
47.1	52.6	42.1	80.0	90.0	90.0	90.0	80.0	100	73.7	84.2	76.2	66.7	63.2	52.6	52.6	52.6	52.6	52.6	73.7
37.5	55.6	44.4	73.7	73.7	73.7	73.7	73.7	73.7	100	88.9	70.0	60.0	55.6	55.6	55.6	55.6	55.6	55.6	66.7
37.5	33.3	44.4	84.2	84.2	84.2	73.7	84.2	84.2	88.9	100	70.0	70.0	66.7	55.6	55.6	55.6	55.6	55.6	55.6
55.6	70.0	60.0	76.2	76.2	76.2	76.2	76.2	76.2	70.0	70.0	100	100	60.0	70.0	70.0	70.0	70.0	70.0	60.0
55.6	60.0	60.0	76.2	76.2	76.2	76.2	76.2	66.7	60.0	70.0	100	100	60.0	70.0	70.0	70.0	70.0	70.0	50.0
37.5	44.4	55.6	73.7	63.2	63.2	63.2	63.2	63.2	55.6	66.7	60.0	60.0	100	55.6	55.6	55.6	55.6	55.6	55.6
37.5	44.4	55.6	63.2	63.2	63.2	63.2	63.2	52.6	55.6	55.6	70.0	70.0	55.6	100	100	100	100	100	77.8
37.5	44.4	55.6	63.2	63.2	63.2	63.2	63.2	52.6	55.6	55.6	70.0	70.0	55.6	100	100	100	100	100	77.8
37.5	55.6	44.4	63.2	73.7	73.7	73.7	73.7	73.7	66.7	55.6	60.0	50.0	55.6	77.8	77.8	77.8	77.8	77.8	100
37.5	33.3	44.4	63.2	63.2	63.2	63.2	63.2	52.6	66.7	66.7	60.0	60.0	55.6	66.7	66.7	66.7	66.7	66.7	66.7
37.5	33.3	44.4	63.2	63.2	63.2	63.2	63.2	52.6	66.7	66.7	60.0	60.0	55.6	66.7	66.7	66.7	66.7	66.7	66.7
47.1	73.7	31.6	60.0	50.0	50.0	50.0	50.0	50.0	42.1	42.1	57.1	57.1	42.1	52.6	52.6	52.6	52.6	52.6	42.1

To view the values in the similarity matrix, select Layout → “Show similarity values”

Comparisons: Print

Click "Show print preview"

Note: recommend changing your layout first to only show those fields you want printed

Index	SourceState	Serotype
1	A AK	Heidelberg
2	A AK	Heidelberg
3	A AK	Heidelberg
4	A AK	Heidelberg
5	A AK	Heidelberg
6	A AK	Heidelberg
7	A AK	Heidelberg
8	A AK	Heidelberg
9	A AK	Heidelberg
10	A AK	Heidelberg
11	A AK	Heidelberg
12	A AK	Heidelberg
13	A AK	Heidelberg
14	A AK	Heidelberg
15	A AK	Heidelberg
16	A AK	Serotype pending
17	A AK	Heidelberg
18	A AK	Serotype pending
19	A	Heidelberg
20	A AK	Heidelberg

Comparisons: Print

Comparison print preview

File Edit Layout Window

- Enlarge image size
- Reduce image size
- Use colors
- Show similarity matrix
- Show comparison information
- Show field names

Print preview

Go to Layout → Show field names to turn these on

Use nodes to move columns

. AK	Heidelberg	JFS-01.0122
. AK	Newport	JFS-01.0122
. AK	Heidelberg	JFS-01.0122
. AK	Heidelberg	JFS-01.0317
. AK	Heidelberg	JFS-01.0122
. AK	Heidelberg	JFS-01.0568
. AK	Heidelberg	JFS-01.0122
. AK	Heidelberg	JFS-01.0122
. AK	Heidelberg	JFS-01
. AK	Heidelberg	JFS-01
. AK	Heidelberg	JFS-01.0049
. AK	Serotype pending	JFS-01.0022
. AK	Heidelberg	JFS-01.0258
. AK	Serotype pending	JFS-01.0258
. AK	Heidelberg	JFS-01.0212
. AK	Heidelberg	JFS-01.0326
. AK	Heidelberg	JFS-01.0326
. AK	Heidelberg	JFS-01.0022
. AK	Heidelberg	JFS-01.0080
. AK	Heidelberg	JFS-01.0080
. AK	Heidelberg	JFS-01.0080
. AK	Heidelberg	JFS-01.0080
. AK	Heidelberg	JFS-01.0080
. AK	Heidelberg	JFS-01.0022

Comparisons: Print

Use toolbar to change settings/view

Comparison print preview

File Edit Layout Window

Overview

Print preview

Shows pages

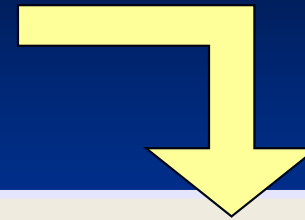
KeBouBerotype	PROE-Xbal-pattern	PROE-Xbal-clatu
. AK Heidelberg	JFSX01.D12Z	Confirmed
. AK Heidelberg	JFSX01.D12Z	Confirmed
. AK Heidelberg	JFSX01.D12Z	Confirmed
. AK Heidelberg	JFSX01.D12Z	Confirmed
. AK Heidelberg	JFSX01.D12Z	Confirmed
. AK Newport	JFSX01.D12Z	Unconfirmed Sex
. AK Heidelberg	JFSX01.D12Z	Confirmed
. AK Heidelberg	JFSX01.0317	Confirmed
. AK Heidelberg	JFSX01.D12Z	Confirmed
. AK Heidelberg	JFSX01.0568	Confirmed
. AK Heidelberg	JFSX01.D12Z	Confirmed
. AK Heidelberg	JFSX01.D12Z	Confirmed
. AK Heidelberg	JFSX01	Unsatisfactory
. AK Heidelberg	JFSX01	Unsatisfactory
. AK Heidelberg	JFSX01.0049	Confirmed
. AK Serotype pendl.	JFSX01.0022	Unconfirmed Sex
. AK Heidelberg	JFSX01.0258	Confirmed
. AK Serotype pendl.	JFSX01.0258	Confirmed
. Heidelberg	JFSX01.0212	Confirmed
. AK Heidelberg	JFSX01.0326	Confirmed
. AK Heidelberg	JFSX01.0326	Confirmed
. AK Heidelberg	JFSX01.0022	Confirmed

Groups: Printing

When printing grouped isolates in a comparison, the colors will automatically change to shapes unless you choose to print in color



Use colors



CT__02032150	Typhi	JPPX01.049	
MI__08ST000498	Typhi	JPPX01.053	
VA__08-0631	Typhi	JPPX01.002	
WV__M08001411	Typhi	JPPX01.046	
LAC__Z20894	Typhi	JPPX01.056	
NY__BAC08000024...	Typhi	JPPX01.002	
NY__BAC08000024...	Typhi	JPPX01.002	
CASC_08SCPH06708	Typhi	JPPX01.045	
PA__08E00636	Typhi	JPPX01.034	
GA__08C0365113	Typhi	JPPX01.034	
HI__N08-148	Typhi	JPPX01.002	
NJ__800895	Typhi	JPPX01.022	
NYC__nyc08-100601...	Typhi	JPPX01.074	
NYC__nyc08-100601...	Typhi	JPPX01.004	
NYC__nyc08-100608...	Typhi	JPPX01.014	
NYC__nyc08-100610...	Typhi	JPPX01.002	
VA__08-0691	Typhi	JPPX01.0026	Cont
CA__M08X01512	Typhi	JPPX01.0459	Cont
NY__BAC08000028...	Typhi	JPPX01.0480	Cont
PA__08E00706	Typhi	JPPX01.0026	Cont
MO__MOENT0773-08	Typhi	JPPX01.0704	Cont

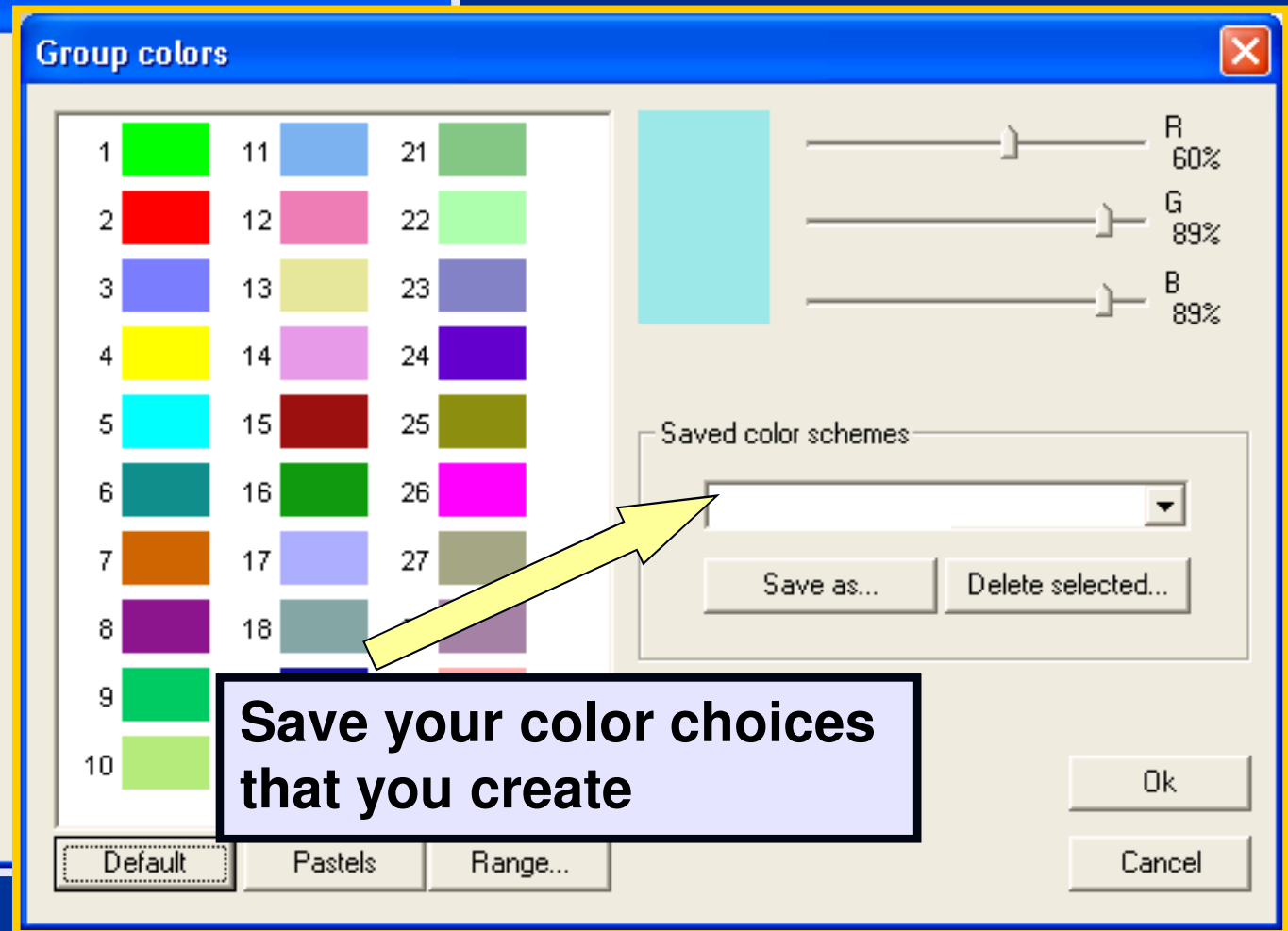
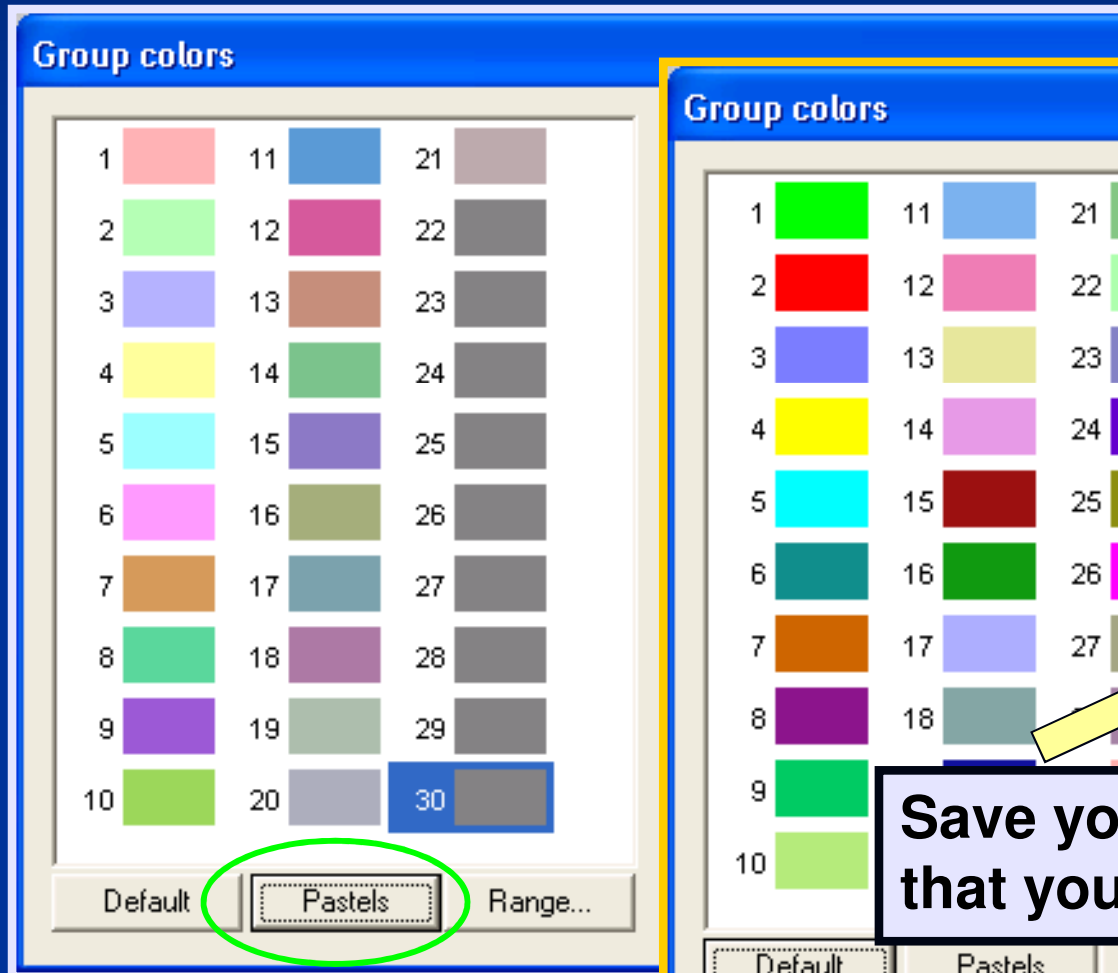
Groups: Customizing Colors

The screenshot shows the 'Comparison' software interface. The 'Groups' menu is open, and 'Edit group colors...' is selected. The 'Group colors' dialog box is displayed, showing a grid of 30 color swatches (10 rows by 3 columns) and a 'Saved color schemes' section with 'Save as...' and 'Delete selected...' buttons. The 'Default', 'Pastels', and 'Range...' buttons are highlighted with a green box.

Group	Color 1	Color 2	Color 3
1	Red	Blue	Green
2	Yellow	Pink	Light Green
3	Purple	Light Yellow	Dark Purple
4	Yellow	Pink	Purple
5	Cyan	Dark Red	Olive
6	Teal	Dark Green	Magenta
7	Brown	Light Purple	Olive
8	Purple	Light Blue	Light Purple
9	Green	Dark Blue	Light Pink
10	Light Green	Dark Red	Light Blue

Under edit group colors, you can change the tone of each color from default or change entirely to “pastels.” You can also choose to do a color gradient with “range.”

Groups: Customizing Colors



Comparisons: Compare Two Entries

The screenshot shows the BioNumerics software interface. The 'Comparison' menu is open, and the 'Compare two entries' option is highlighted. A yellow arrow points from the first instruction box to this menu item. The 'Database entries' table is visible below the menu.

Index	Key	LabID
1	07-65...	
2	07-65...	
3	FL 352	
4	0001...	USA
5	0001...	USA
6	01E0...	USA
7	03X0...	
8	07-03...	USA
9	07-180	USA
10	07-271	USA
11	07-287	USA

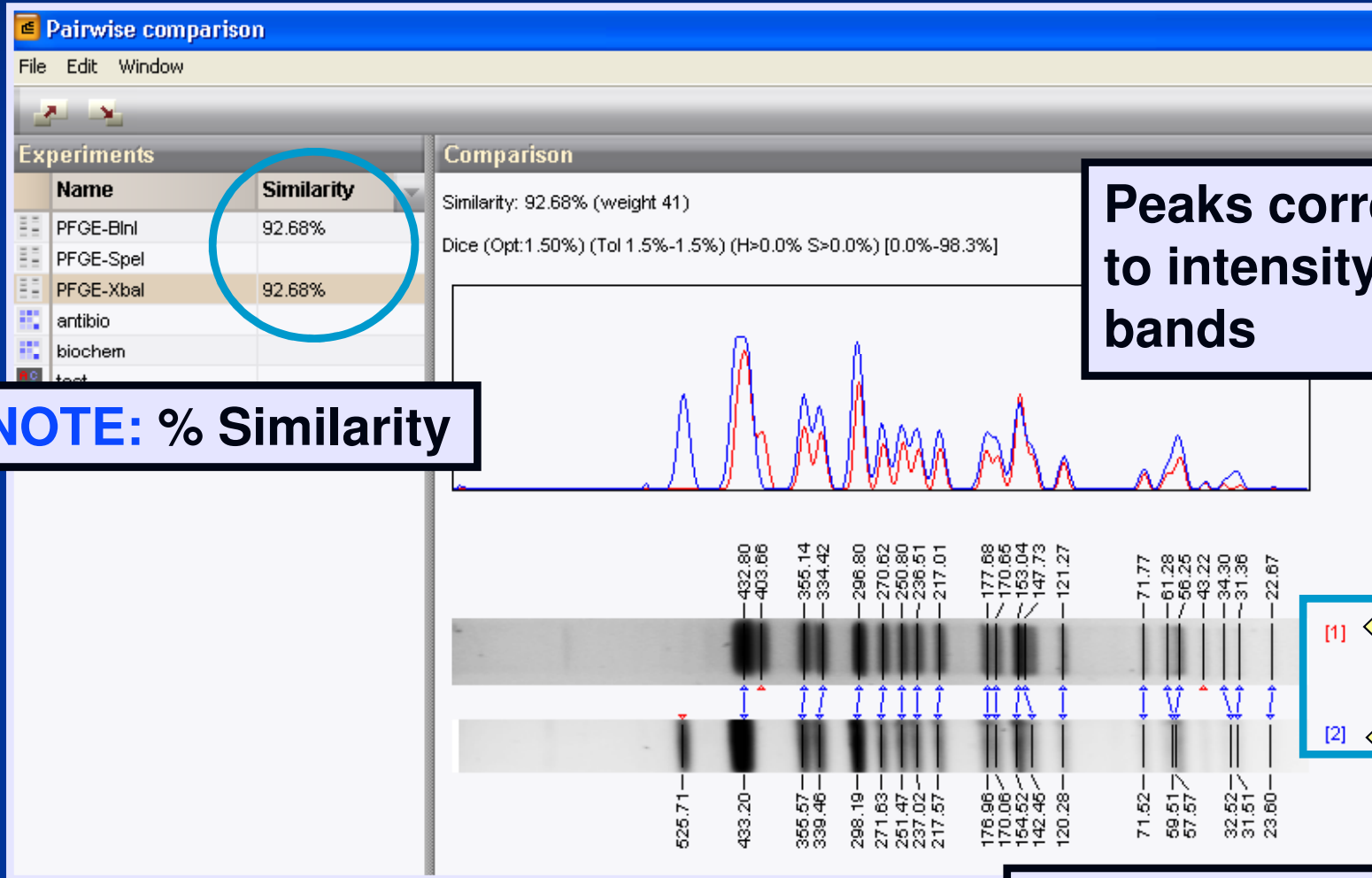
Database: Ecoli-client | 8114 entries | 6 experiments | \vcdc\project\CCID_NCZVED_DFBMD_PulseNet\Data\Ecoli-client

1. Select two isolates in your database to compare

2. Select “Compare two entries” from comparison menu

Comparisons: Compare Two Entries

Also called a Pairwise comparison or 2x2 comparison



Advanced Queries: Components

BioNumerics

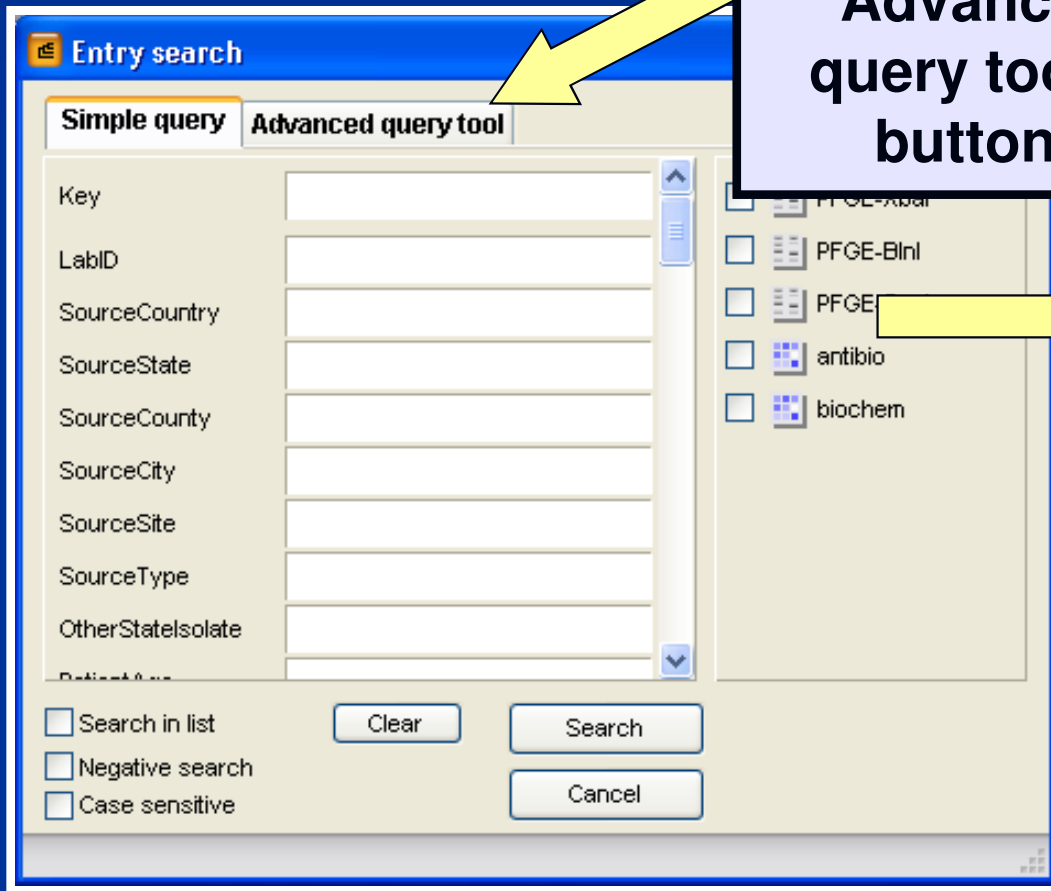
File Edit Database Subsets Experiments Comparison Identification Scripts Window

Search & select database

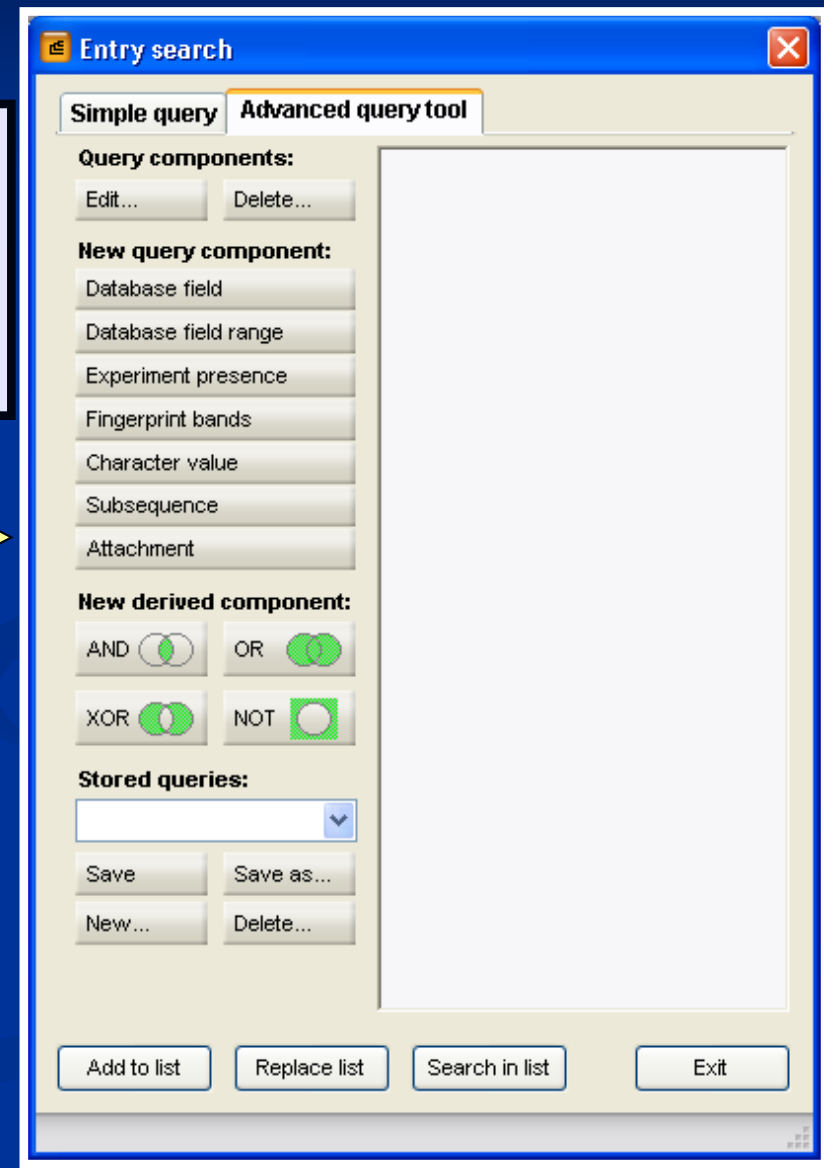
Key	LabID	SourceCountry	SourceState	1	2	3	4	5
AL__AL-8002391-06	AL__	USA	AL					
AL__AL-8002392-06	AL__	USA	AL					
AL__AL-8002394-06	AL__	USA	AL					
AL__AL-8002395-06	AL__	Canada	AL					
AL__AL-8002397-06	AL__	USA	AL					
AL__AL-8002441-06	AL__	USA	AL					
AL__AL-8002442-06	AL__	USA	AL					
AL__AL-8002443-06	AL__	USA	AL					
AL__AL-8002444-06	AL__	USA	AL					
AL__AL-8002445-06	AL__	USA	AL					
AL__AL-8002446-06	AL__	USA	AL					
AL__AL-8002447-06	AL__	USA	AL					
AL__AL-8002462-06	AL__	USA	AL					

Click the search icon in the BioNumerics main window.

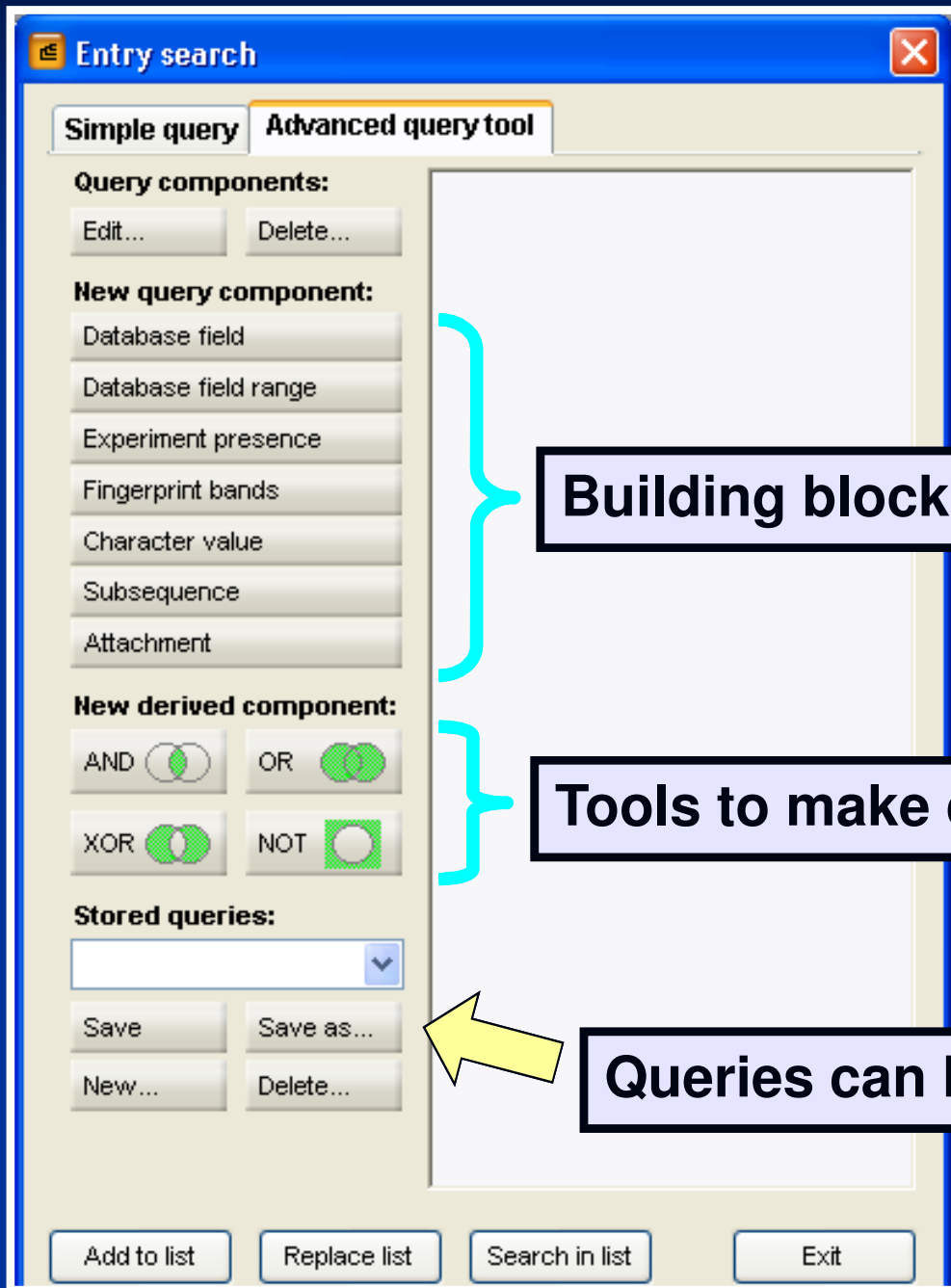
Advanced Queries: Components



Select the
"Advanced
query tool"
button



Advanced Queries: Components



Building blocks of the query

Tools to make composite queries

Queries can be stored/saved/deleted

Advanced Queries: Components

Entry search

Simple query | **Advanced query tool**

Query components:

Edit... Delete...

New query component:

- 1 Database field
- 2 Database field range
- 3 Experiment presence
- 4 Fingerprint bands
- 5 Character value
- 6 Subsequence
- 7 Attachment

Database field search

Search for:

In field:

Case sensitive

Regular expression

Cancel

1) Search in a specific field or in any field

Database field range

Select entries where field

is between

and

Case sensitive

Numerical values

OK

Cancel

2) Search a range
Ex: date range

3) Search for the presence of an Experiment type

Experiment presence

Select entries for which the experiment

is present

OK

Cancel

Advanced Queries: Components

Entry search

Simple query | **Advanced query**

Query components:

Edit... Delete...

New query component:

- 1 Database field
- 2 Database field range
- 3 Experiment presence
- 4 Fingerprint bands
- 5 Character value
- 6 Subsequence
- 7 Attachment

Fingerprint band presence

Fingerprint experiment: [Dropdown]

Target range: 0.00 - 100.00
Normalised run length (%) [Dropdown]

Intensity filter: Band height [Dropdown]

between [Input] and [Input]

Number of bands present: Min. 1 Max. [Input]

Cancel OK

4) Search for presence of bands w/range of molecular weights

Character value

Experiment: [Dropdown]

Character: < All > [Dropdown]

Min. value: 0.00 [Input] OK [Button]

Max. value: 0.00 [Input] Cancel [Button]

5) Search in your character types (i.e. antibio, biochem)

Advanced Queries: Components

Entry search

Simple query | **Advanced query tool**

Query components:

Edit... Delete...

New query component:

- 1 Database field
- 2 Database field range
- 3 Experiment presence
- 4 Fingerprint bands
- 5 Character value
- 6 Subsequence
- 7 Attachment

Subsequence

Experiment: [dropdown]

Search string: [text input]

Maximum number of mismatches allowed: 0 [spinners]

Allow gaps in sequence

Allow gaps in search string

Accept IUPAC codes

OK Cancel

6) Search for a specific subsequence in a sequence type experiment (if you have these)

7) Search within attachments that are linked to database entries

Attachment search

Attachment type: <All> [dropdown]

Search text: [text input]

In description

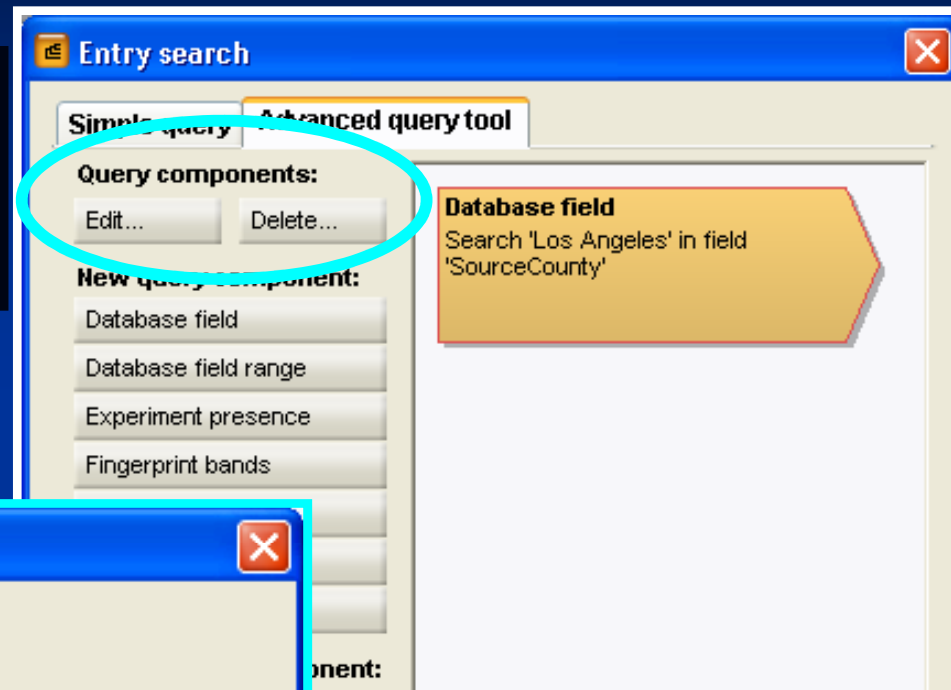
In text

Case sensitive

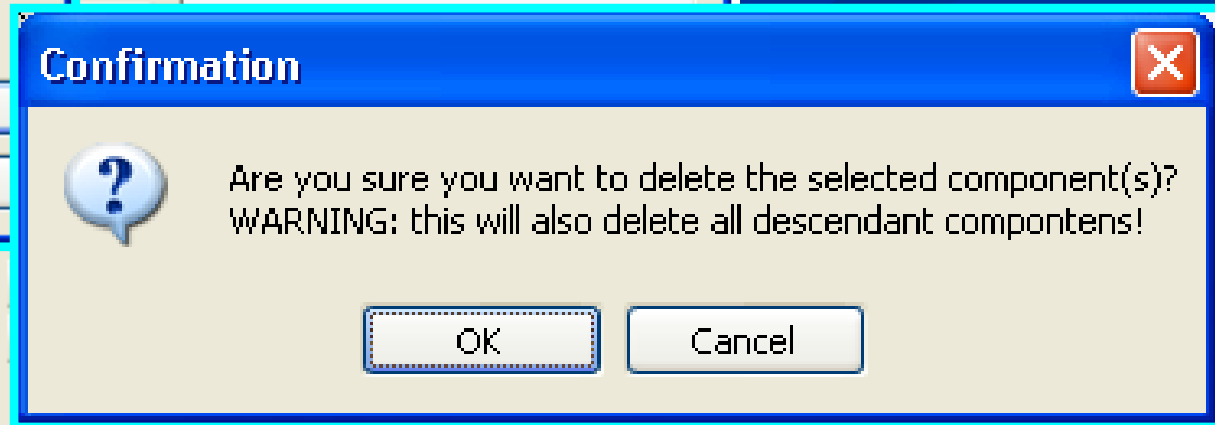
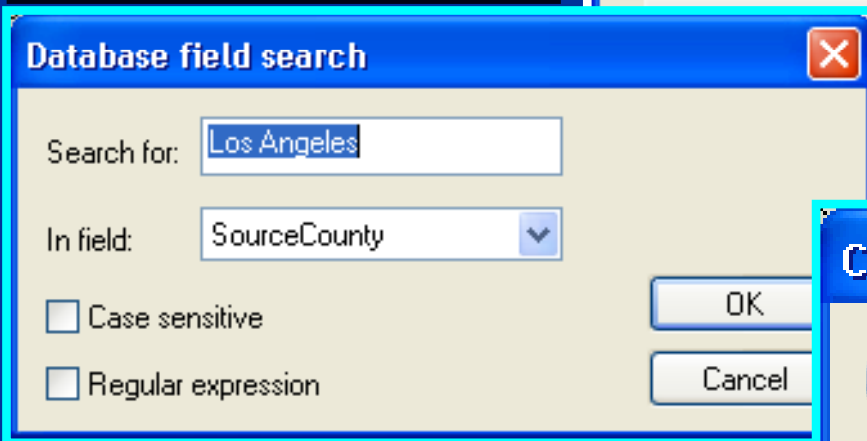
OK Cancel

Advanced Queries: Editing Components

You can edit or delete any of the components on the right-hand side



“Edit” opens the Component



“Delete” opens a confirmation window

Advanced Queries: Logical Operators

Entry search

Simple query | **Advanced query tool**

Query components:
Edit... Delete...

New query component:
Database field
Database field range
Experiment presence
Fingerprint bands
Character value
Subsequence
Attachment

New derived component:
AND OR
XOR NOT

Database field
Search 'Los Angeles' in field 'SourceCounty'

Stored queries:
Save Save as...
New... Delete...

Add to list Replace list Search in list Exit

Logical Operators link Components together

All conditions must be met

At least 1 component should be fulfilled

Exactly 1 condition from components should be fulfilled

Condition will be inverted for component

Advanced Queries: Saving

Entry search

Simple query | **Advanced query tool**

Query components:
Edit... Delete...

New query component:
Database field
Database field range
Experiment presence
Fingerprint bands
Character value
Subsequence
Attachment

New derived component:
AND OR
XOR NOT

Stored queries:
[Dropdown menu]
Save Save as...
New... Delete...

Add to list Replace list Search in list Exit

“Save” or “Save as...” allows you to save your query

Save query

Enter a name for this query:

OK

Cancel

“New” or “Delete” will reset the current query

Confirmation



Are you sure you want to reset the contents of the current query?

OK

Cancel

Advanced Queries

Example 1: County and Date Range

Search for isolates from “Los Angeles” county that were uploaded in May - June 2009

The screenshot shows the 'Entry search' application window. The 'Advanced query tool' tab is active. Under 'Query components', there are 'Edit...' and 'Delete...' buttons. The 'New query component' list includes 'Database field', 'Database field range', 'Experiment presence', 'Fingerprint bands', 'Character value', 'Subsequence', and 'Attachment'. A yellow arrow points to 'Database field'. Below this is the 'New derived component' section with logical operators: AND, OR, XOR, and NOT. The 'Stored queries' section has a dropdown menu and 'Save', 'Save as...', 'New...', and 'Delete...' buttons. The 'Database field search' dialog is open, showing 'Search for: Los Angeles' and 'In field: SourceCounty'. It also has checkboxes for 'Case sensitive' and 'Regular expression', and 'OK' and 'Cancel' buttons.

1. Click “Database field”

2. Enter search string [cannot use a wildcard (*)] and select “SourceCounty”

Advanced Queries

Example 1: County and Date Range

Entry search

Simple query **Advanced query tool**

Query components:
Edit... Delete...

New query component:
Database field
Database field range
Experiment presence
Fingerprint bands
Character value
Subsequence
Attachment

New derived comp
AND OR
XOR NOT

Stored queries:
Save Save
New... Delete...

Add to list Replace list Search in list Exit

Database field
Search 'Los Angeles' in field 'SourceCounty'

Database field range
Select entries where field UploadDate
is between 2009-05-01
and 2009-06-30
 Case sensitive
 Numerical values
OK
Cancel

1. Select "Database field range"

2. Select "UploadDate" and fill in date range
NOTE: date format

Advanced Queries

Example 1: County and Date Range

Entry search

Simple query **Advanced query tool**

Query components:
Edit... Delete...

New query component:
Database field
Database field range
Experiment presence
Fingerprint bands
Character value
Subsequence
Attachment

New derived component:
AND OR
XOR

Stored queries:
[Dropdown menu]
Save Save as...
New... Delete...

Database field
Search 'Los Angeles' in field 'SourceCounty'

AND

Database field range
'UploadDate' is between '2009-05-01' and '2009-06-30'

Replace list

1. Select both using CTRL + mouse click

2. Press "AND"

3. Press "Replace list" to start the query

Advanced Queries

Example 2: Experiment Presence

Need to report all *Xbal*'s that were done from July 1, 2008 – June 30, 2009 for ELCs

Entry search

Simple query | **Advanced query tool**

Query components:
Edit... Delete...

New query component:
Database field
Database field range
Experiment presence
Fingerprint bands
Character value
Subsequence
Attachment

New derived component:
AND OR
XOR NOT

Stored queries:
Save Save as...
New... Delete...

Database field range
'UploadDate' is between
'2008-07-01' and '2009-06-30'

Experiment presence
Select entries for which the experiment
PFGE-Xbal
is present
OK
Cancel

Add to list | Replace list | Search in list | Exit

1. Select Date Range

2. Select "Experiment Presence"

3. Choose PFGE-Xbal

Advanced Queries





Example 2: Experiment Presence

Entry search

Simple query **Advanced query tool**

Query components:
Edit... Delete...

New query component:
Database field
Database field range
Experiment presence
Fingerprint bands
Character value
Subsequence
Attachment

New derived component:
AND  OR 
XOR  NOT 

Stored queries:
[Dropdown menu]
Save Save as...
New... Delete...

Database field range
'UploadDate' is between
'2008-07-01' and '2009-06-30'

Experiment presence
Experiment 'PFGE-XbaI' is present

AND

Add to list Replace list Search in list Exit

Select both components
and choose "AND"

Advanced Queries

Example 3: Multiple Serotypes and Date

Search for all *Salmonella* Typhimurium/var Copenhagen and I 4,[5],12:i:- isolates uploaded in 2008

The screenshot shows a query builder interface. On the left, under 'Query components:', there are buttons for 'Edit...' and 'Delete...'. Below that, 'New query component:' lists options: 'Database field', 'Database field range', 'Experiment presence', 'Fingerprint bands', 'Character value', 'Subsequence', and 'Attachment'. A yellow arrow points to 'Database field'. Under 'New derived component:', there are options for 'AND', 'OR', 'XOR', and 'NOT' with Venn diagrams. At the bottom, 'Stored queries:' has a dropdown menu and buttons for 'Save', 'Save as...', 'New...', and 'Delete...'. At the very bottom, there are buttons for 'Add to list', 'Replace list', and 'Search in list'. A 'Database field search' dialog box is open, showing 'Search for:' with the text 'Typhimurium', 'In field:' with a dropdown menu showing 'Serotype', and checkboxes for 'Case sensitive' and 'Regular expression'. 'OK' and 'Cancel' buttons are at the bottom right of the dialog.

Select "Database field"

Database field search

Search for: Typhimurium

In field: Serotype

Case sensitive

Regular expression

OK

Cancel

Add 3 Serotype components: Typhimurium, Typhimurium var. O 5 - (Copenhagen), I 4,[5],12:i:-
NOTE: using the Entry Properties screen will assure that search results are accurate

Advanced Queries

Example 3: Multiple Serotypes and Date

The screenshot shows the 'Entry search' application interface. The 'Advanced query tool' tab is active, displaying a list of query components. Two components are visible: 'Database field' (Search 'Typhimurium' in field 'Serotype') and 'Database field' (Search 'Typhimurium var. O 5 - (Copenhagen)' in field 'Serotype'). A yellow arrow points from the 'Database field range' option in the 'New query component' list to the first component. A second yellow arrow points from the 'Database field range' dialog box to the first component. The dialog box is titled 'Database field range' and contains the following fields: 'Select entries where field' (UploadDate), 'is between' (2008-01-01), and 'and' (2008-12-31). There are also checkboxes for 'Case sensitive' and 'Numerical values', and 'OK' and 'Cancel' buttons.

1. Select "Database field range"

2. Select "UploadDate"

3. Fill in the range

Advanced Queries

Example 3: Multiple Serotypes and Date

Entry search

Simple query **Advanced query tool**

Query components:
Edit... Delete...

New query component:
Database field
Database field range
Experiment presence
Fingerprint bands
Character value
Subsequence
Attachment

New derived component:
AND OR
XOR NOT

Stored queries:
Save Save as...
New... Delete...

Database field
Search 'Typhimurium' in field 'Serotype'

Database field
Search 'Typhimurium var. O 5 - (Copenhagen)' in field 'Serotype'

Database field
Search '14,[5],12:i:-' in field 'Serotype'

Database field range
'UploadDate' is between '2008-01-01' and '2008-12-31'

1

OR

Add to list Replace list Search in list Exit

Entry search

Simple query **Advanced query tool**

Query components:
Edit... Delete...

New query component:
Database field
Database field range
Experiment presence
Fingerprint bands
Character value
Subsequence
Attachment

New derived component:
AND OR
XOR NOT

Stored queries:
Save Save as...
New... Delete...

Database field
Search 'Typhimurium' in field 'Serotype'

Database field
Search 'Typhimurium var. O 5 - (Copenhagen)' in field 'Serotype'

Database field
Search '14,[5],12:i:-' in field 'Serotype'

Database field range
'UploadDate' is between '2008-01-01' and '2008-12-31'

2

OR

AND

Add to list Replace list Search in list Exit

1. Select all 3 Database field boxes and choose “OR”
2. Select “OR” and Database field range box and choose “AND”

Advanced Queries

Example 4: Multiple Values

Search for all non-human *Salmonella* Typhimurium isolates uploaded in 2009 with an *Xba*I experiment file.

Entry search

Simple query **Advanced query tool**

Query components:
Edit... Delete...

New query component:
Database field
Database field range
Experiment presence
Fingerprint bands
Character value
Subsequence
Attachment

New derived component:
AND
OR
XOR
NOT

Stored queries:

Database field
Search 'Typhimurium' in field 'Serotype'

Database field
Search 'Human' in field 'SourceType'

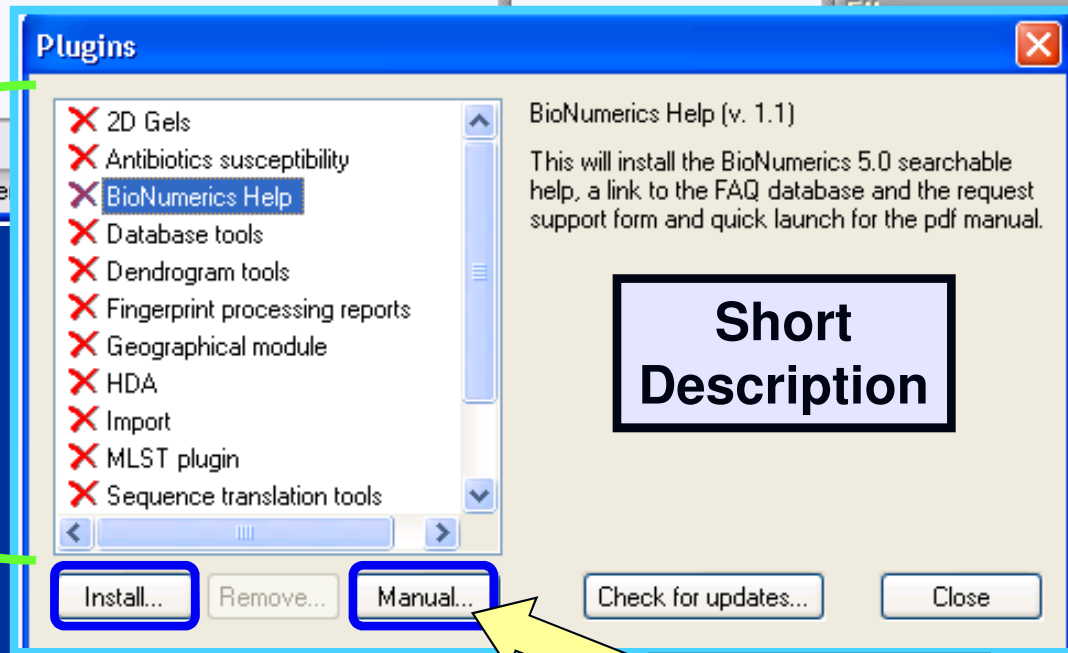
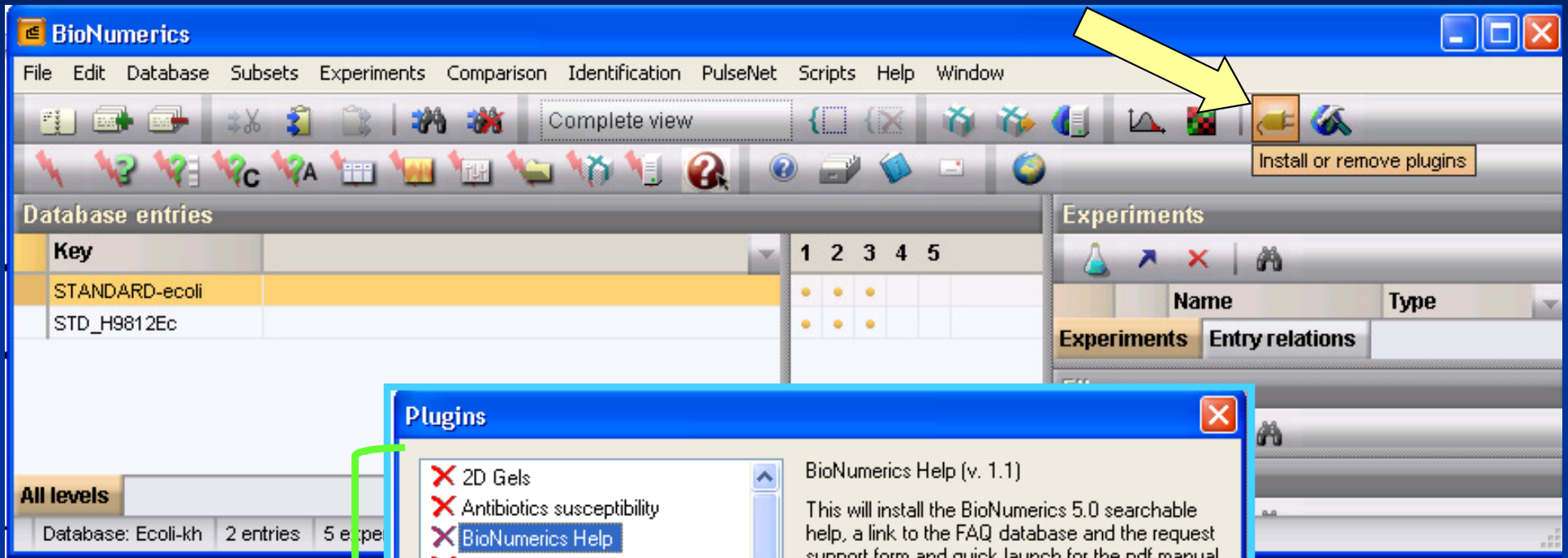
Database field range
'UploadDate' is between '2009-01-01' and '2009-12-31'

Experiment presence
Experiment 'PFGE-XbaI' is present

NOT

AND

Plugins




**Available
Plugins**

**Short
Description**

**Full
Description**

Plugins

BioNumerics Plugin Tools

The **Plugin Tools** offer a wide variety of additional useful tools to the BioNumerics software, provided as a service by Applied Maths. The plugin tools are based on the powerful BioNumerics **script** language, which makes it possible for the user to customize them according to personal needs. They can be run directly from the Applied Maths website, or can be downloaded to the local BioNumerics script folder. To download scripts, press the  in the button toolbar of this window.

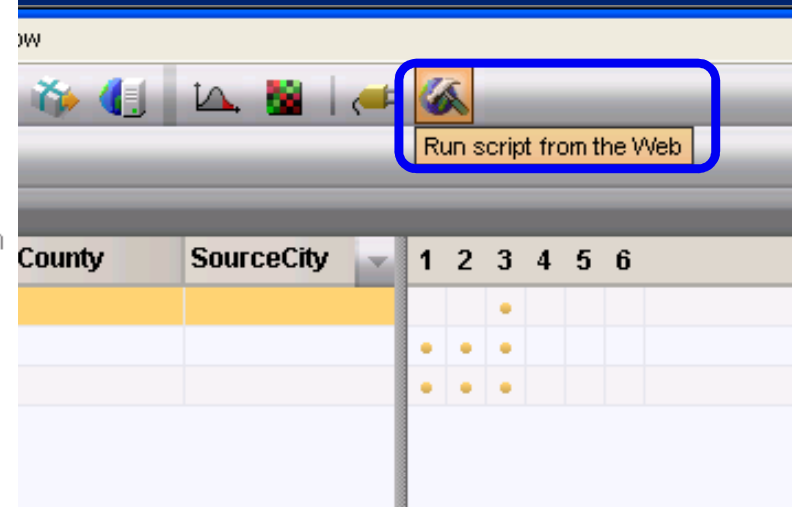
You are free to run and/or download these tools for personal use, and modify the scripts as needed. **Redistribution or reproduction of the plugin tools by any means is prohibited.**

Each plugin tool is provided "as is" and with no further liability or guarantee from Applied Maths. Any consequences that may arise from the use of these tools are at your own responsibility.

Please select from the following categories:

- BioNumerics Online Help
- Database related tools
- Fingerprint related tools
- Sequence related tools
- Library and Identification tools
- Comparison tools
- Typing techniques
- Import tools
- Export tools
- Queries
- Miscellaneous

**Available
Categories**



Plugins

- Can install plugins when installing a new database—suggest reading about them before installing
- Can provide useful tools
- Recommend trying the plugin out on either a “dummy” or test database or a copy of a database to see how it really works

Questions?



Thank you for your attention
The findings and conclusions in this presentation are those of the author and do not necessarily represent the views of the Centers for Disease Control and Prevention