

# Querying and Performing Comparisons



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# Overview

- **Query Local/National Databases**
  - Simple query
  - Query Tools
  - Use for National database
- **Perform Comparisons**
  - Add/remove/rearrange entries
  - Dendrograms
  - Save/load comparisons

# Simple Query

The screenshot shows a window titled "Entry search" with two tabs: "Simple query" (selected) and "Advanced query tool". The "Simple query" tab contains a list of search fields on the left and a list of checkboxes on the right. The fields include Key, LabID, SourceCountry, SourceState, SourceCounty, SourceCity, SourceSite, SourceType, Traveled\_To, Exposure, TypeDetails, OtherStatelstate, PatientAge, PatientSex, IsolatDate, ReceivedDate, and UploadDate. The checkboxes on the right are PFGE-Blnl, PFGE-Spel, PFGE-Xbal, antibio, and biochem. At the bottom, there are checkboxes for "Search in list", "Negative search", and "Case sensitive", along with "Clear", "Search", and "Cancel" buttons.

Search based on experiment type

Search based on database field

More specific search options

Use wildcard (\*) before and after text

# Simple Query

Click on the Binoculars Icon in Main Window



BioNumerics

File Edit Database Subsets Experiments Comparison Identification PulseNet Scripts Win

Complete view

Search & select database entries (F3)

Database entries

Index	Key	LabID	SourceCountry	SourceState
1	FL 3...			FL
2	#48			
3	#48 ...			
4	00-0...	TN	USA	TN
5	00-0...	TN	USA	TN
6	00-0...	TN	USA	TN
7	00-0...	TN	USA	MO
8	00-0...	TN	USA	TN
9	00-0...	TN	USA	TN
10	00-0...	TN	USA	TN
11	00-0...	TN	USA	TN
12	00-0...	TN	USA	TN
13	00-2...	TN	USA	TN

Entry search

Simple query | Advanced query tool

SourceState

Serotype

PFGE-Xbal-pattern

PFGE-Xbal-status

PFGE-BlnI-pattern

PFGE-BlnI-status

Outbreak

SourceCountry

SourceCity

SourceCountry

SourceType

SourceSite

PatientAge

PatientSex

IsolatDate

ReceivedDate

UploadDate

\*2009\*

Search in list

Negative search

Case sensitive

Clear Search Cancel

PFGE-BlnI

PFGE-Spel

PFGE-Xbal

antibio

biochem

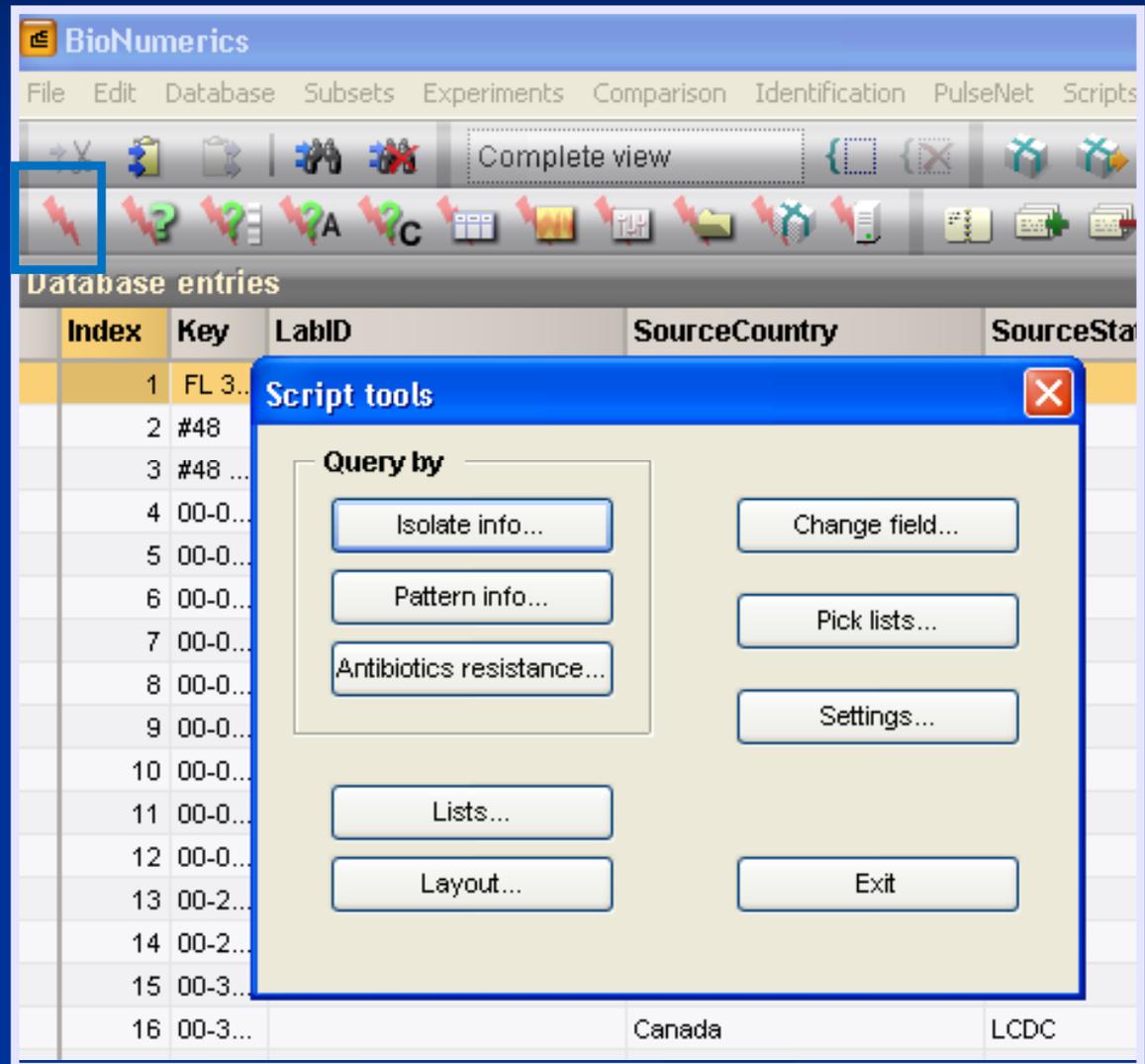
Search yields all isolates in your local database that have “2009” as the Upload Date

# Query by PulseNet Tools

To start, click on the “PulseNet tools” icon.



**Note:** This option is useful to see all available query options and modify field options. Be very careful using this script.



The screenshot shows the BioNumerics software interface. The 'PulseNet tools' icon (a red lightning bolt) is highlighted in the toolbar. A 'Script tools' dialog box is open, showing various query options.

Index	Key	LabID	SourceCountry	SourceSta
1	FL 3...			
2	#48			
3	#48 ...			
4	00-0...			
5	00-0...			
6	00-0...			
7	00-0...			
8	00-0...			
9	00-0...			
10	00-0...			
11	00-0...			
12	00-0...			
13	00-2...			
14	00-2...			
15	00-3...			
16	00-3...		Canada	LCDC

The 'Script tools' dialog box contains the following options:

- Query by:
  - Isolate info...
  - Change field...
  - Pattern info...
  - Pick lists...
  - Antibiotics resistance...
  - Settings...
- Lists...
- Layout...
- Exit

# Query by Isolate

To start, click on the “Query by Isolate” icon.



Note: This option is useful for demographics-based searches. Allows for the use of drop-down menus.

Enter Search Criteria.  
(Ex: Date Range)

Click “Replace List”

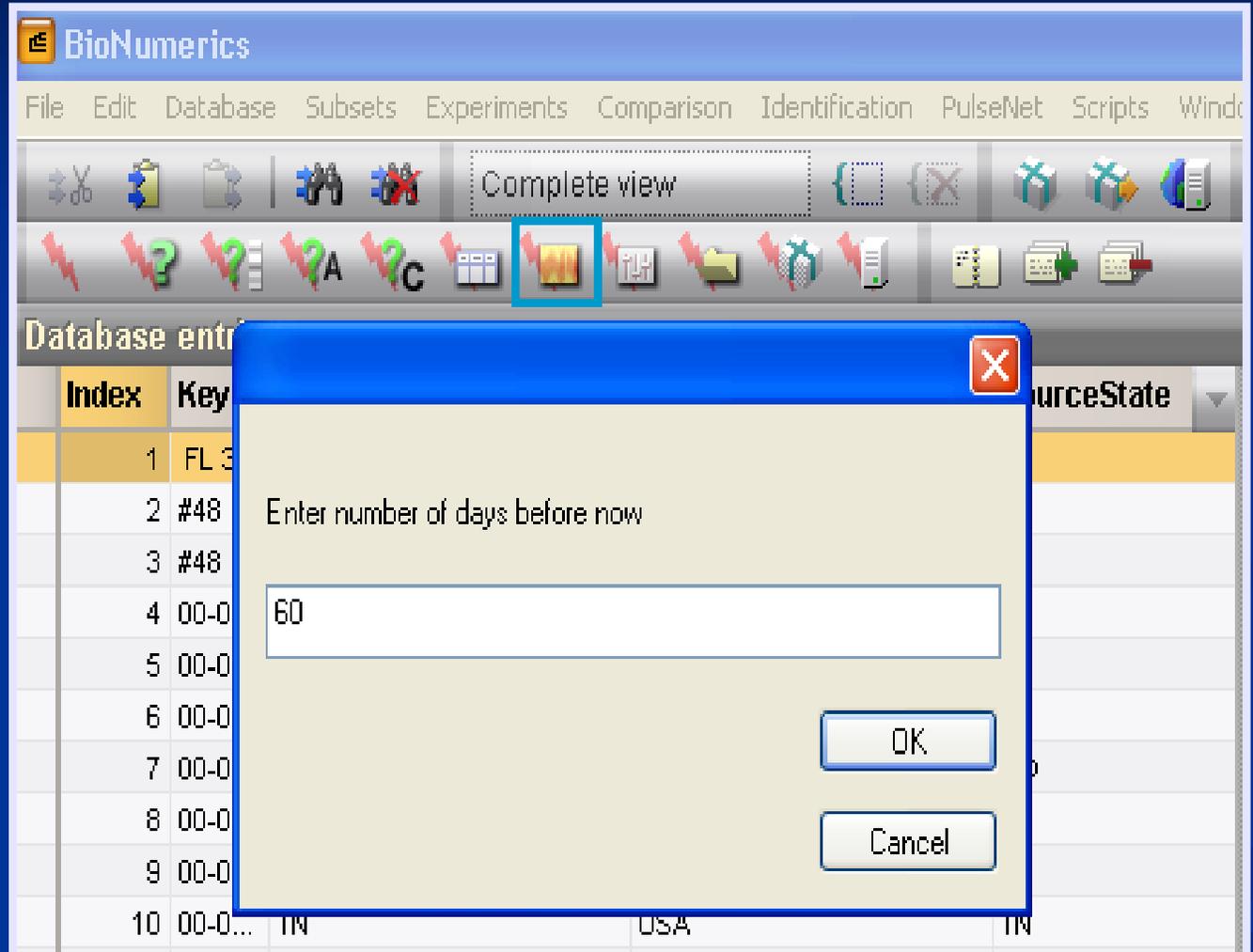
The screenshot shows the BioNumerics software interface. The 'Isolate query' dialog box is open, displaying various search criteria. The 'Isolate date' section is highlighted with a blue box and a yellow arrow pointing to it from the text 'Enter Search Criteria. (Ex: Date Range)'. The 'Replace list' button is also highlighted with a blue box and a yellow arrow pointing to it from the text 'Click “Replace List”'. The dialog box includes sections for Source, Patient, Upload date, and Received date, each with 'from' and 'to' date pickers. The 'Isolate date' section has 'from' set to Saturday, July 05, 2008 and 'to' set to Friday, September 05, 2008. The 'Replace list' button is located at the bottom right of the dialog box.

# Hot List Tool

A Hot List search can be used to show all recently uploaded isolates within your local database



**NOTE:** the isolates *must* have an upload date for this query to work



Database entries

Index	Key	SourceState
1	FL 3	
2	#48	
3	#48	
4	00-0	
5	00-0	
6	00-0	
7	00-0	
8	00-0	
9	00-0	
10	00-0... TN	USA TN

Click on “Hot List” icon and enter number of days (Ex. 60 days). Why? You want to see what has been uploaded in the past 60 days

# Hot List Tool

The screenshot shows the BioNumerics software interface. The title bar reads "BioNumerics". The menu bar includes "File", "Edit", "Database", "Subsets", "Experiments", "Comparison", "Identification", "PulseNet", "Scripts", and "Window". The toolbar contains various icons for file operations, analysis, and visualization. Below the toolbar is a "Database entries" section containing a table with columns: Index, Key, LabID, SourceCountry, SourceSta, and six columns numbered 1 through 6. The table lists 13 entries, with the first entry (Index 1) highlighted in yellow. A text box with a black border and white background is overlaid on the table, containing the text: "Isolates submitted within the past 60 days will be selected". At the bottom of the interface, there is a status bar with the text "All levels" and "Database: Ecoli-client 8114 entries 6 experiments \\vcdc\project\CCID\_NCZVED\_DFBMD\_PulseNet\Data\Ecoli-client".

Index	Key	LabID	SourceCountry	SourceSta	1	2	3	4	5	6
1	08EMS0...		USA	MS	•		•			
2	08M-MIS...		USA	ME	•		•			
3	224425		USA	DE	•		•			
4	226868		USA	DE	•		•			
5	231540		USA	DE	•		•			
6	AM0107...						•			
7	AM0114...						•			
8	AM0154...						•			
9	AM0220...						•			
10	AM0237...						•			
11	AM0255...						•			
12	AM0256...						•			
13	AM0264...						•			

**Isolates submitted within the past 60 days will be selected**

All levels  
Database: Ecoli-client 8114 entries 6 experiments \\vcdc\project\CCID\_NCZVED\_DFBMD\_PulseNet\Data\Ecoli-client

# Query Tools for National Databases

Isolate Query:



Hot List :



National List:



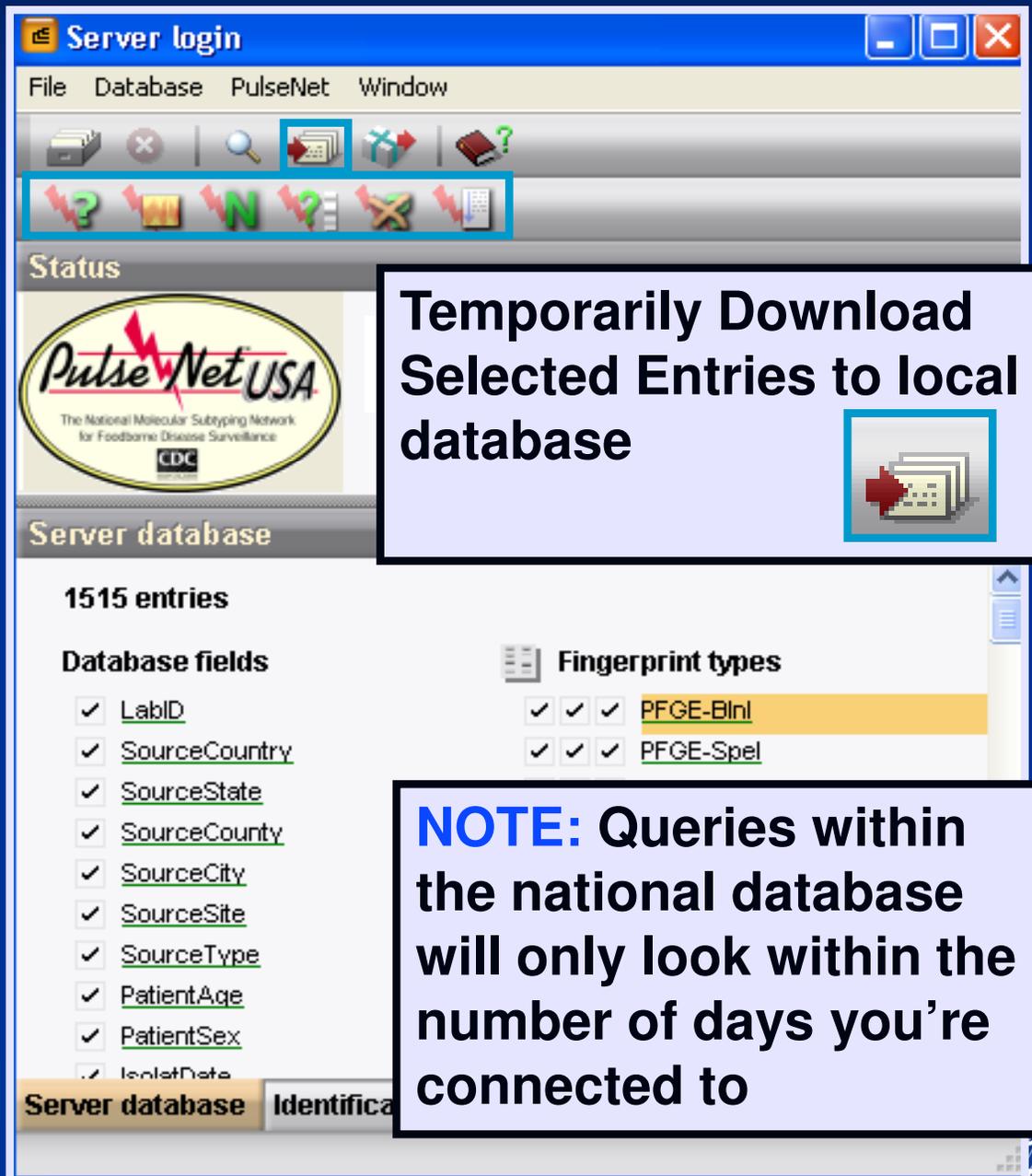
Pattern Query:



Delete Selected Entries:



Show Recent Matches:



Temporarily Download Selected Entries to local database

**NOTE:** Queries within the national database will only look within the number of days you're connected to

# Narrow Your Search

The results of your hot-list search will appear.

**Important!** It may be a LARGE number of entries! You do not need to view or download all of them. Downloading an entire 60-day search wastes time and server space, and may cause your database to time out. Therefore, think about what you **REALLY** need – and narrow your search!

The screenshot shows the BioNumerics software interface. A window titled "Server login" is open, displaying a table of "Database entries". The table has three columns: "Index", "Key", and "LabID". The table contains 11 rows of data, with the 9th row highlighted. A dialog box titled "Number of entries selected: 1515" is overlaid on the interface, with an "OK" button. A yellow arrow points from the dialog box to the text "Wow! 1515 isolates!".

**Ex: 60 Day Hot List Search**

Index	Key	LabID
1	08EMS0...	
2	08M-MIS...	
3	224425	
4	226868	
5	231540	
6	AM0107...	
7	AM0114...	
8	AM0154...	
9	AM0220...	
10	AM0237...	
11	AM0255...	

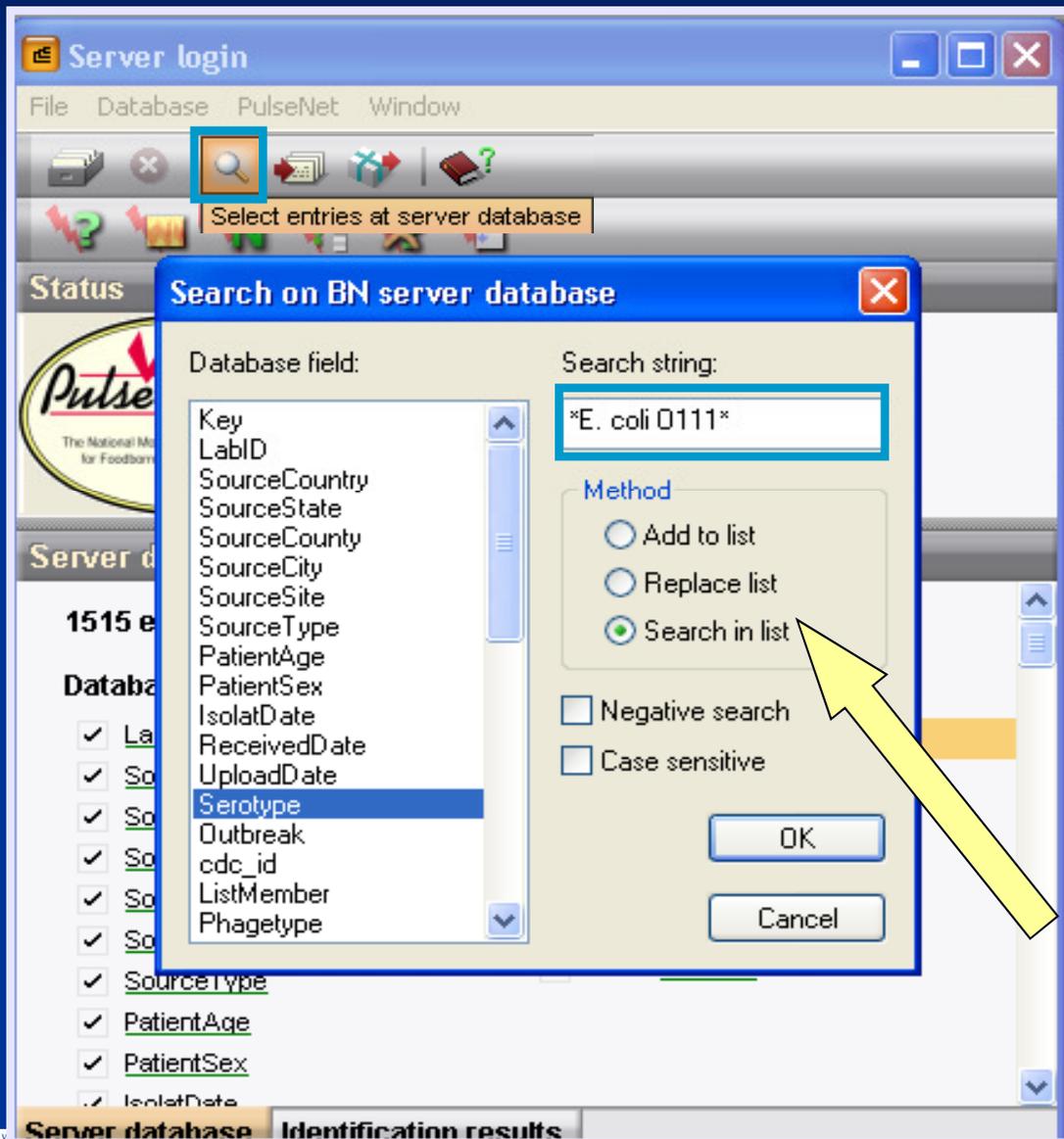
Number of entries selected: 1515

OK

**Wow! 1515 isolates!**

I need to narrow my search before I download anything...

# Narrow Your Search



Use query tools or the “Select entries at server database” icon to narrow your search



Ex: Search to include only isolates of the particular serotype that you are looking for

“Search in List” (your list includes the 1515 that were selected from your original hot-list search)

# Narrow Your Search

After narrowing your search, you have a smaller number of isolates that will not take as long to download

The screenshot shows the PulseNet USA web interface. At the top, there is a 'Status' section with the PulseNet USA logo and CDC branding. Below this is the 'Server database' section, which displays '1515 entries'. The interface is divided into 'Database fields' and 'Fingerprint types' sections. The 'Database fields' section includes checkboxes for LabID, SourceCountry, SourceState, SourceCounty, SourceCity, SourceSite, SourceType, PatientAge, PatientSex, and IsolatDate. The 'Fingerprint types' section includes checkboxes for PFGE-BlnI, PFGE-Spel, PFGE-Xbal, antibio, and biochem. A 'Query' dialog box is open in the center, displaying '1 selected' and an 'OK' button. A yellow arrow points from the right side of the screen to the '1 selected' text in the dialog box. The bottom of the interface has a navigation bar with 'Server database' and 'Identification results' tabs.

# Download Entries

The screenshot shows the BioNumerics software interface. The 'Server login' window is active, displaying a menu with 'File', 'Database', 'PulseNet', and 'Window'. A toolbar contains several icons, with a 'Download the selected entries from the server' icon highlighted by a red box. The main window, titled 'BioNumerics', shows a 'Database entries' table with columns for Index, Key, Location, LabID, and SourceCountry. A yellow arrow points to the 'Location' column of the first row, which contains the value 'Bundle'. A text box explains that this isolate will be downloaded temporarily as a bundle.

**Click on “Download selected entries from server” icon to download to your local database**

Index	Key	Location	LabID	SourceCountry	1	2	3	4	5	6
1	WV_...	Bundle	WV_	USA			•			
2	FL 352	Local			•					
3	#48	Local			•		•			
4	#48 p...				•					
5	00-04...						•			
6	00-06...						•			
7	00-06...						•	•		
8	00-06...						•	•	•	
9	00-07...						•			
10	00-07...						•	•	•	

**Isolate(s) will be downloaded temporarily in the form of a bundle**

# Create New Comparison

The screenshot shows the BioNumerics application window. The 'Comparison' menu is open, and the 'Create new comparison' option is highlighted in blue. A yellow arrow points to this option. Below the menu, a table of database entries is visible. The table has columns for Index, Key, and LabID. The first three rows are highlighted in yellow, and the last row (Index 15) is also highlighted in yellow. A text box with a black border and white background is overlaid on the bottom right of the screenshot, containing the following text:

**Select isolates for comparison, then go to “Create new comparison” under the “Comparison” menu**

Index	Key	LabID
1	FL 352	
2	#48	
3	#48 p...	
4	00-04...	TN
5	00-06...	TN
6	00-06...	TN
7	00-06...	TN
8	00-07...	TN
9	00-07...	TN
10	00-07...	TN
11	00-07...	TN
12	00-08...	TN
13	00-23...	TN
14	00-25...	TN
15	00-32...	TN

# Create New Comparison

The screenshot shows the BioNumerics software interface. The main window is titled "Comparison" and displays a table of 12 entries. A yellow arrow points to the "12 entries" label at the bottom of the table, with a text box containing the instruction "Notice number of entries".

The table has the following columns: Index, Key, and LabID.

Index	Key	LabID
1	00-04...	TN
2	00-06...	TN
3	00-06...	TN
4	00-06...	TN
5	00-07...	TN
6	00-07...	TN
7	00-07...	TN
8	00-07...	TN
9	00-08...	TN
10	00-23...	TN
11	00-25...	TN
12	00-32...	TN

Database: Ecoli-client 8114 entries 6 experiments Wcdc\project\CCID\_NCZVED\_DFBMD\_PulseNet\Data\Ecoli-client

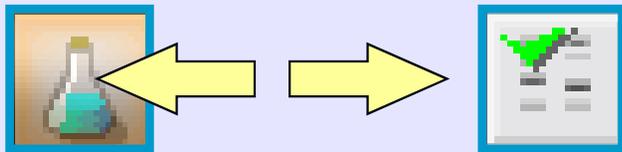
# View Experiment Patterns

Choose enzyme from pull-down menu

The screenshot shows a software interface with a pull-down menu open, listing enzymes: PFGE-BlnI, PFGE-SpeI, PFGE-XbaI, antibio, and biochem. The 'PFGE-XbaI' option is selected. A yellow arrow points from the text 'Choose enzyme from pull-down menu' to the selected option. In the top toolbar, a 'Show Image' icon (a flask with a green flame) is highlighted with a blue box and a yellow arrow. Below the toolbar, the 'Experiment data' panel shows 'PFGE-XbaI' selected. The 'Information fields' panel shows a table with columns 'SourceCoun...' and 'SourceState'. The table contains 12 rows of data, all with 'USA' in the 'SourceCoun...' column and 'AL' or 'AR' in the 'SourceState' column.

	SourceCoun...	SourceState
→	USA	AL
→	USA	AL
→	USA	AL
→	USA	AR

Click on the “Show Image” icon in top toolbar,



or choose enzyme from the Experiments panel to show pattern images

# Arrange Entries by Field

The screenshot shows the 'Comparison' software interface. The 'Information fields' table is visible, with a right-click context menu open over the 'Serotype' column. The menu options are:

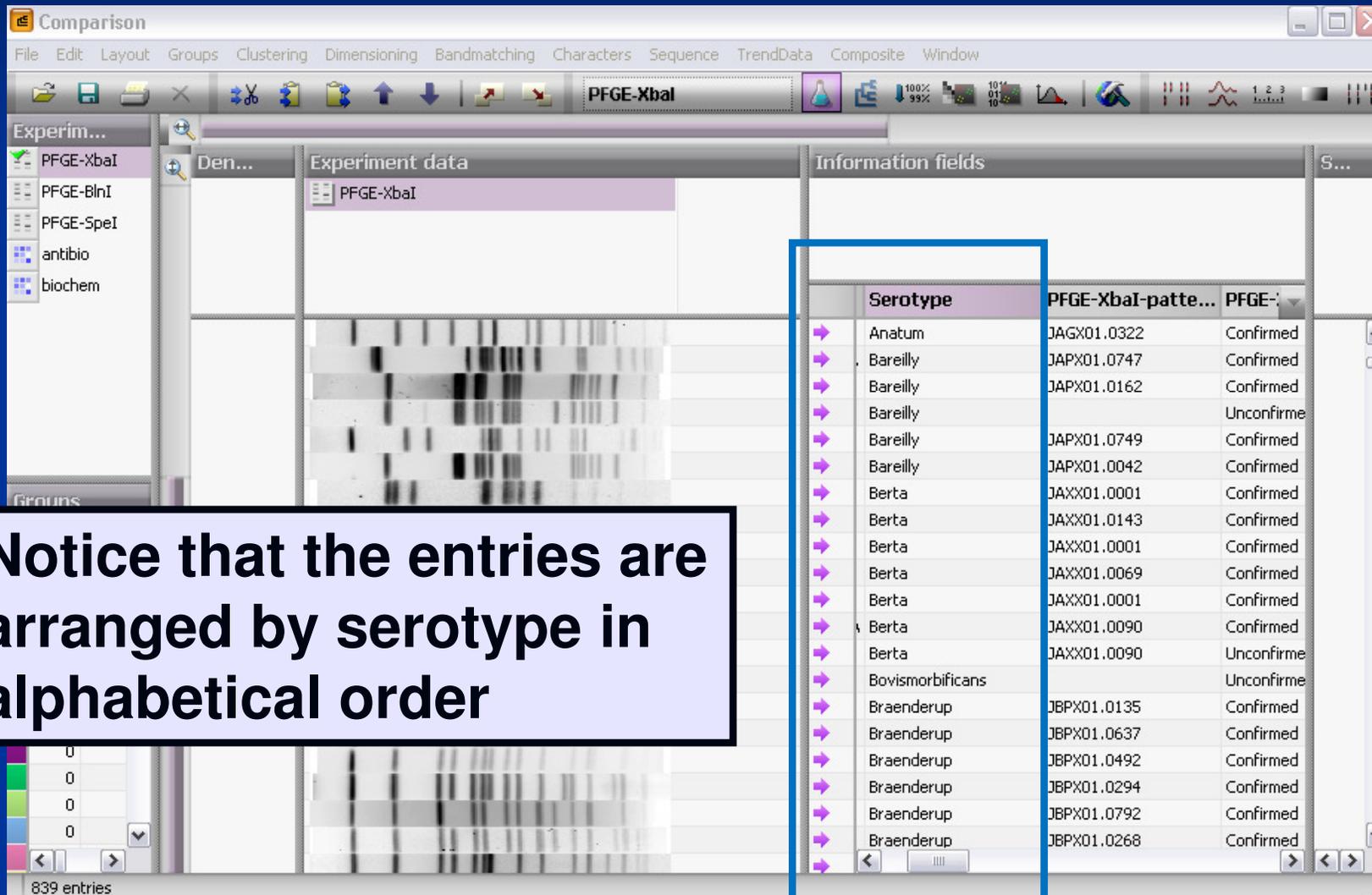
- Arrange entries by field
- Arrange entries by field (numerical)
- Freeze left pane
- Create groups from database field

A yellow arrow points to the 'Arrange entries by field' option. A text box at the bottom right of the screenshot contains the following text:

**Right-click on field (ex. Serotype) and choose "Arrange entries by field"**

Serotype	PFGE-XbaI-patte...	PFGE-
Thompson		
Poona		
Serotype pending		
Panama		
Heidelberg	JF6X01.0022	Confirmed
Mbandaka	TDRX01.0005	Confirmed
Salmonella species	JAAX01	Unconfirme
Newport	JJPX01.3058	Confirmed

# Arrange Entries by Field



The screenshot shows a software window titled "Comparison" with a menu bar (File, Edit, Layout, Groups, Clustering, Dimensioning, Bandmatching, Characters, Sequence, TrendData, Composite, Window) and a toolbar. The main area is divided into several panes. On the left, a "Groups" pane lists "PFGE-XbaI", "PFGE-BlnI", "PFGE-SpeI", "antibio", and "biochem". The central pane shows a gel electrophoresis image. On the right, an "Information fields" pane displays a table of data. A blue box highlights the "Serotype" column and the list of entries, which are sorted alphabetically. The status bar at the bottom indicates "839 entries".

Serotype	PFGE-XbaI-patte...	PFGE-
Anatum	JAGX01.0322	Confirmed
Bareilly	JAPX01.0747	Confirmed
Bareilly	JAPX01.0162	Confirmed
Bareilly		Unconfirme
Bareilly	JAPX01.0749	Confirmed
Bareilly	JAPX01.0042	Confirmed
Berta	JAXX01.0001	Confirmed
Berta	JAXX01.0143	Confirmed
Berta	JAXX01.0001	Confirmed
Berta	JAXX01.0069	Confirmed
Berta	JAXX01.0001	Confirmed
Berta	JAXX01.0090	Confirmed
Berta	JAXX01.0090	Unconfirme
Bovismorbificans		Unconfirme
Braenderup	JBPX01.0135	Confirmed
Braenderup	JBPX01.0637	Confirmed
Braenderup	JBPX01.0492	Confirmed
Braenderup	JBPX01.0294	Confirmed
Braenderup	JBPX01.0792	Confirmed
Braenderup	JBPX01.0268	Confirmed

**Notice that the entries are arranged by serotype in alphabetical order**

# Bring Selected Entries to Top

The screenshot shows the 'Comparison' software interface. The 'Edit' menu is open, and the option 'Bring selected entries to top' is highlighted. The main window displays a comparison of PFGE-Xbal data. The 'Information fields' table is visible, showing a list of entries with their keys and serotypes. The selected entries are highlighted in purple.

Key	Serotype	F
AK__1015300168	Javiana	JGGX
AK__1015900092	Chester	JCPX
AK__1016000063	Heidelberg	JF6X
AK__1016500092	Heidelberg	JF6X
AK__1016600103	Miami	TEAX
AK__1016800134	Panama	JKGX
AK__1017400158	Enteritidis	JEGX
AK__1017600197	Hadar	TDKX
AK__1017700001	Westhampton	JGXX
AK__1018700094	Typhimurium	JPXX
AK__1018900197	Typhimurium	JPXX
AK__1019700210	Bareilly	JAPX
AK__1020900156	Enteritidis	JEGX
AK__1021500169	IV 43:z4,z23:- (Hout...	JGXX
AK__1021500173	Enteritidis	JEGX
AK__1021600131	Enteritidis	JEGX
AK__1022100285	Enteritidis	JEGX

**Another view of selected entries within a comparison: go to Edit and select “Bring selected entries to top”**

# Bring Selected Entries to Top

The screenshot shows the 'Comparison' software window. The main area displays a gel electrophoresis image with multiple lanes. To the right, a table lists entries with their keys and serotypes. The top of the list is highlighted in purple, indicating selected entries.

Key	Serotype	
AK__1017400158	Enteritidis	JEG>
AK__1017600197	Hadar	TDK>
AK__1017700001	Westhampton	
AK__1018700094	Typhimurium	JPX>
AK__1018900197	Typhimurium	JPX>
AK__1019700210	Bareilly	JAP>
AK__1020900156	Enteritidis	JEG>
AK__1021500169	IV 43:z4,z23:- (Hout...	
AK__1021500173	Enteritidis	JEG>
AK__1021600131	Enteritidis	JEG>
AK__1022900091	Sandiego	JCP>

Now the selected entries are at the top of the comparison

# Freeze Left Pane

To set a column to be fixed, right click on the column before the column to be fixed

Key	Serotype	PFGE-XbaI
AK__1008900305	Heidelberg	
AK__1009600211	Typhimurium	
AK__1011600109	Oranienburg	
AK__1011600110	Oranienburg	
AK__1011700194	Othmarschen	
AK__1011900196	Bovismorbificans	TDFX01.0014
AK__1012600192	Enteritidis	JEGX01.0005
AK__1013000305	Enteritidis	JEGX01.0005
AK__1013300210	Enteritidis	JEGX01.0005
AK__1013700069	Serotype pending	JF6X01.0258
AK__1013700070	Enteritidis	JEGX01.0005
AK__1013800167	Enteritidis	JEGX01.0163
AK__1013900178	Mbandaka	JAAX01
AK__1015300168	Javiana	JGGX01.1520
AK__1015900092	Chester	JCPX01.0060
AK__1016000063	Heidelberg	JF6X01.0326
AK__1016500092	Heidelberg	JF6X01.0122
AK__1016600103	Miami	TEAX01.0216
AK__1016800134	Panama	JKGX01.0010
AK__1017400158	Enteritidis	JEGX01.0004

By freezing a column, all columns located before highlighted column will also be stationary

# Freeze Left Pane

Notice the line in front of the highlighted column

The screenshot shows a software window titled "Comparison" with a menu bar (File, Edit, Layout, Groups, Clustering, Dimensioning, Bandmatching, Characters, Sequence, TrendData, Co) and a toolbar. The left pane contains a tree view with "Experim..." and "PFGE-XbaI" selected. The central pane shows "Experiment data" with a gel image. The right pane shows a table with columns "Key", "Serotype", and "PFGE-XbaI". A yellow arrow points to the scrollbar of the table.

Key	Serotype	PFGE-XbaI
AK__1008900305	Heidelberg	JF6X01.0326
AK__1009600211	Typhimurium	JPXX01.1314
AK__1011600109	Oranienburg	JJXX01.0733
AK__1011600110	Oranienburg	JJXX01.0248
AK__1011700194	Othmarschen	
AK__1011900196	Bovismorbificans	TDFX01.0014
AK__1012600192	Enteritidis	JEGX01.0005
AK__1013000305	Enteritidis	JEGX01.0005
AK__1013300210	Enteritidis	JEGX01.0005
AK__1013700069	Serotype pending	JF6X01.0258
AK__1013700070	Enteritidis	JEGX01.0005
AK__1013800167	Enteritidis	JEGX01.0163
AK__1013900178	Mbandaka	JAAX01
AK__1015300168	Javiana	JGGX01.1520
AK__1015900092	Chester	JCPX01.0060
AK__1016000063	Heidelberg	JF6X01.0326
AK__1016500092	Heidelberg	JF6X01.0122
AK__1016600103	Miami	TEAX01.0216
AK__1016800134	Panama	JKGX01.0010
AK__1017400158	Enteritidis	JEGX01.0004

You can use the cursor to scroll through the other database fields

# Copy and Paste in a Comparison

If you want to add patterns to a comparison window:



- Click “Copy selection” in main window or another comparison window



- Click “Paste selection...” in comparison window

The screenshot displays the BioNumerics software interface. The main window shows a table of database entries with columns for Index, Key, LabID, SourceCountry, and SourceSt. The 'Copy selection' button is highlighted in the main window's toolbar. The '2008 (Comparison)' window is open, showing a dendrogram and a table of experiment data. The 'Paste selection into comparison' button is highlighted in the comparison window's toolbar.

Index	Key	LabID
1	FL 352	
2	0001...	
3	0001...	
4	01E0...	
5	03X0...	
6	07-03...	
7	07-180	
8	07-271	
9	07-287	
10	07-579	
11	07-65...	
12	07-65...	

# Cut in a Comparison

If you want to take patterns out of a comparison window:

- Select the patterns
- Click “Cut selection...” in comparison window
- Click “OK”

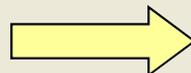


Index	Key	LabID
4	01E0...	
5	03X0...	
6	07-03...	
7	07-180	
8	07-271	
9	07-287	
10	07-579	
11	07-65...	
12	07-65...	
13	07-65...	
14	07-65...	
15	07-65	

## Confirmation



Are you sure you want to remove the current selection from this comparison?



OK

Cancel

# Show Band Markings

The screenshot shows the 'Comparison' software interface. The top toolbar contains various icons, with the 'Show bands' icon (a purple square with vertical lines) highlighted by a blue box. Below the toolbar, the 'Experiments' list on the left includes 'PFGE-XbaI', 'PFGE-BlnI', and 'PFGE-SpeI'. The main window displays a gel electrophoresis image with red band markings. The 'Information fields' panel on the right shows a table of data:

Key	Serotype
AK__1023800181	Berta
AK__1023900109	Thompson
AK__1024200162	Thompson
AK__1024300089	
AK__1024400113	Thompson
AK__1024400115	
AK__1024400144	Enteritidis
AK__1024600107	Thompson
AK__1024600108	
AK__1025100112	Enteritidis
AK__1025100113	Newport
AK__1025100114	Newport
AK__1025900116	
AK__1026400196	Typhimurium
AK__1026500098	Typhimurium
AK__1026500099	Heidelberg
AK__1027200206	I 4,[5],12:i:-
AK__1027400081	Lomalinda
AK__1027700203	Lomalinda
AK__1027800135	I 4,[5],12:i:-

Click on “Show bands”  
icon in top toolbar to  
show band markings



# Show Metric Scale

Comparison

File Edit Layout Groups Clustering Dimensioning Bandmatching Characters Sequence TrendData Composite Window

PFGE-XbaI

100% 99% 101 01 10

1 2 3

Show metrics scale

Experiments

- PFGE-XbaI
- PFGE-BlnI
- PFGE-SpeI
- antibio
- biochem

Groups

Size	Name
0	
0	
0	

Dend...

Experiment data

PFGE-XbaI

2000 1500 800.00 600.00 500.00 400.00 250.00 200.00 150.00 100.00 40.00 20.00

Information fields

Key	Serotype
AK__1023800181	Berta
AK__1023900109	Thompson
AK__1024200162	Thompson
AK__1024300089	
AK__1024400113	Thompson
AK__1024400115	
AK__1024400144	Enteritidis
AK__1024600107	Thompson
AK__1024600108	
AK__1025100112	Enteritidis
AK__1025100113	Newport
AK__1025100114	Newport
AK__1025900116	
AK__1026400196	Typhimurium
AK__1026500098	Typhimurium
AK__1026500099	Heidelberg
AK__1027200206	I 4,[5],12:i:-
AK__1027400081	Lomalinda
AK__1027700203	Lomalinda
AK__1027800135	I 4,[5],12:i:-

27 entries

Click on “Show metric scale” icon in top toolbar to show band markings



# Perform Cluster Analysis

The screenshot shows the 'Comparison' software interface. The main window displays a gel electrophoresis image with a scale from 2000 to 20.00. A context menu is open over the gel image, showing options for cluster analysis. A callout box points to the 'Calculate cluster analysis' option.

**Calculate cluster analysis**  
Pairwise similarities

**Calculate maximum parsimony tree**  
Evolutionary modelling

**Calculate minimum spanning tree**  
Population modelling

Key	Serotype
AK__1023800181	Berta
AK__1023900109	Thompson
AK__1024200162	Thompson
AK__1024300089	
AK__1024400113	Thompson
AK__1024400115	
AK__1024400144	Enteritidis
AK__1024600107	Thompson
AK__1024600108	
AK__1025100112	Enteritidis
AK__1025100113	Newport
AK__1025100114	Newport
AK__1025900116	
AK__1026400196	Typhimurium
AK__1026500098	Typhimurium
AK__1026500099	Heidelberg
AK__1027200206	I 4,[5],12:i:-
AK__1027400081	Lomalinda
AK__1027700203	Lomalinda
AK__1027800135	I 4,[5],12:i:-

27 entries

Click on “Calculate cluster analysis”

# Cluster Analysis Parameters

## ■ PulseNet Parameters for Cluster Analysis

**Comparison settings (Fingerprint)**

Similarity coefficient

Curve based:

Pearson correlation

Cosine coefficient

Band based:

Jaccard

Dice

Jeffrey's x

Ochiai

Different bands

Fuzzy logic

Area sensitive

Relaxed doublet matching

Dendrogram type

UPGMA

Ward

Neighbor Joining

Single linkage

Complete linkage

Advanced

**Position tolerance settings**

Optimization:  %

Band comparison

Position tolerance:  %

Change towards end of fingerprint:  %

Minimum height:  %

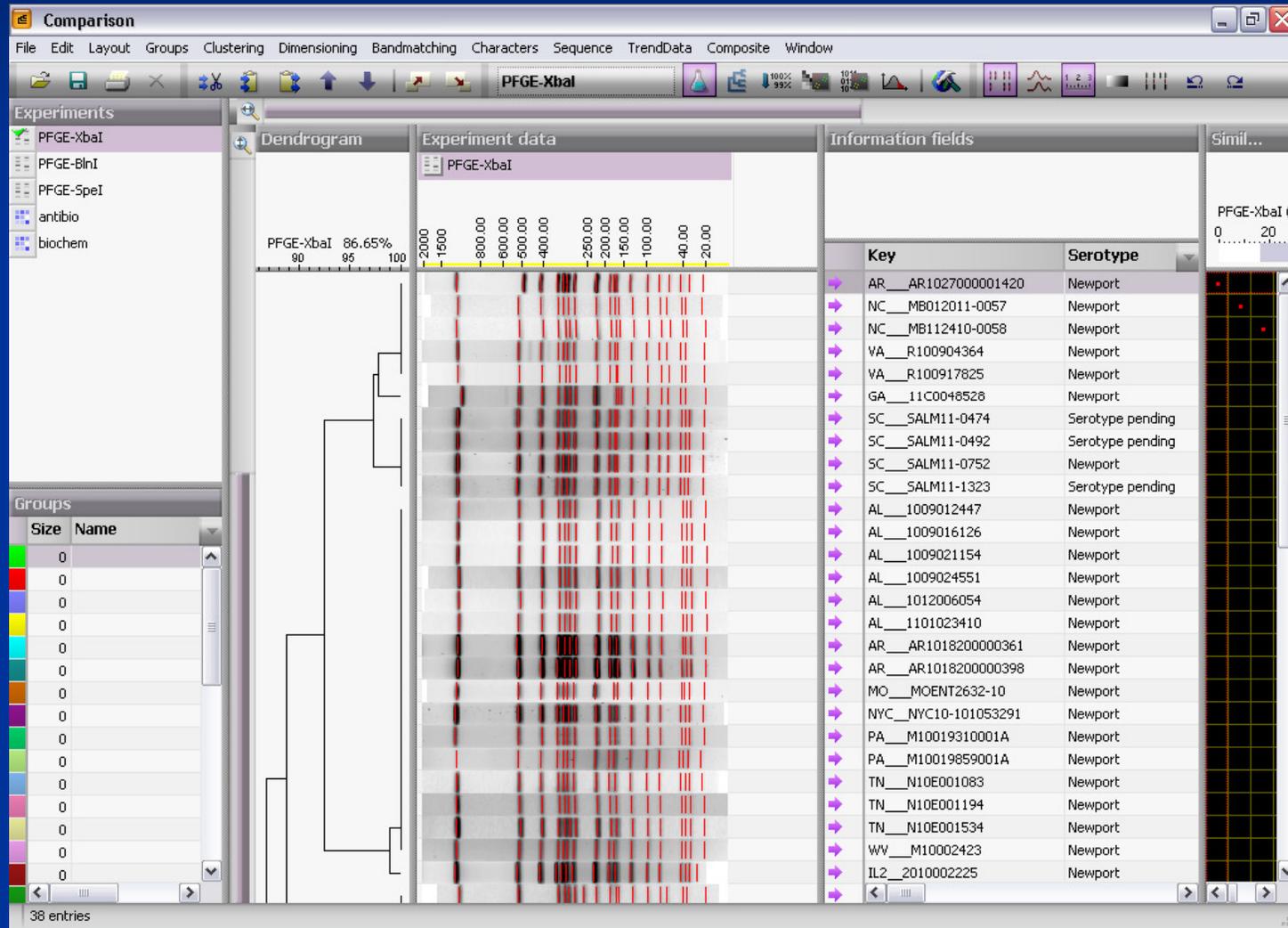
Minimum surface:  %

Uncertain bands

Ignore

Include

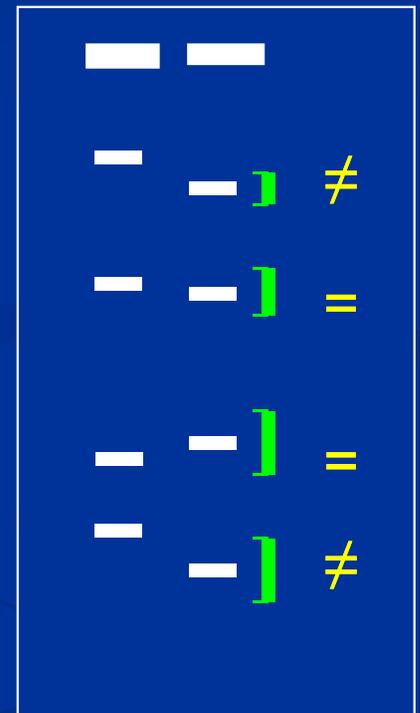
# Dendrogram



# Cluster Analysis Parameters: Position Tolerance

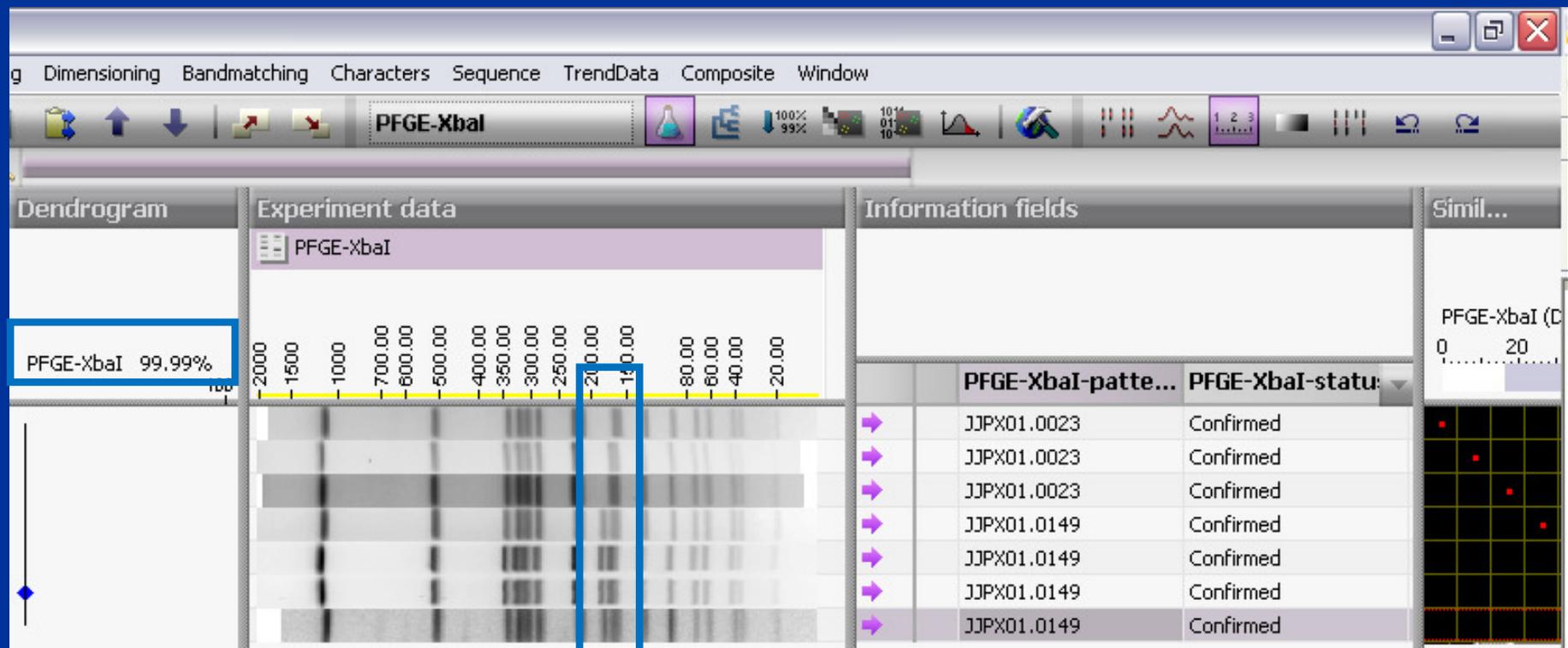
## Computer Interpretation of Band Positions

- To the computer a band is not a band, but a band plus a window surrounding the band
- When comparing band positions of two profiles the computer will consider the band position identical if the band position in one of the profiles falls within a window around a band in the other profile
- The size of this window is called the Position Tolerance (set at 1.5% of the run length of the band)



# Cluster Analysis Parameters: Position Tolerance Set Too High

The computer will interpret some unique profiles as being identical!



# Save a Comparison

The screenshot shows the 'Comparison' software window. The menu bar includes File, Edit, Layout, Groups, Clustering, Dimensioning, Bandmatching, Characters, Sequence, TrendData, and Co. The toolbar contains various icons, with the 'Save' icon (a floppy disk) highlighted by a red box. Below the toolbar, there is a list of experiments: PFGE-BlnI, PFGE-Spel, PFGE-Xbal (selected with a green checkmark), antibio, and biochem. The main area displays a 'Dendrogram' and 'Experiment data' for 'PFGE-Xbal'. The dendrogram shows a similarity scale from 60 to 100, with a value of 52.39% indicated. The experiment data shows a gel electrophoresis image.

Click “Save” to save your comparison



Name your comparison and Click “OK”

The 'Save comparison as' dialog box is shown. It has a title bar with a close button (X). The main area contains a text input field with the text '2010'. To the right, under the 'Location' section, there are two radio buttons: 'Local database' (which is selected) and 'Connected database'. At the bottom right, there are 'OK' and 'Cancel' buttons.

# Compare One Pattern to Others

The screenshot shows a software window titled "Comparison" with a menu bar (File, Edit, Layout, Groups, Clustering, Dimensioning, Bandmatching, Characters, Sequence, TrendData, Con...). Below the menu is a toolbar with various icons. The main area is divided into three panes: "Experi..." (left), "Dend..." (middle), and "Information fields" (right). The "Experi..." pane lists several experiments, with "PFGE-Xbal" selected. The "Dend..." pane shows a dendrogram representing the clustering of patterns. The "Information fields" pane displays a table with columns "Index" and "Key". A yellow arrow points from the dendrogram to the table, highlighting the row with Index 8 and Key "CDC\_9711-184".

Index	Key
1	CDC__10344
2	CDC__10345
3	CDC__10356
4	CDC__10342
5	CDC__CDC06pf2113
6	CDC__CDC06pf2115
7	CDC__CDC06pf2117
8	CDC_9711-184
9	CDC__CDC06pf2123
10	CDC__06pf2113
11	CDC__06pf2117
12	CDC__06pf2123
13	CDC__10348
14	CDC__10343
15	CDC__10347
16	CDC__10355
17	CDC__9702-53
18	CDC__9705-66
19	CDC__9706-46
20	CDC__06pf2115

**Click to highlight one isolate (key) within your comparison to compare it to others in your comparison**

# Compare One Pattern to Others

Click on “Arrange by decreasing similarity”  to compare the highlighted pattern to all others within the comparison window

Index	Key	LabID	SourceCo
1	CDC__10344	CDC_	
2	CDC__10345	CDC_	
3	CDC__10356	CDC_	
4	CDC__10342	CDC_	USA
5	CDC__CDC06pf2113		USA
6	CDC__CDC06pf2115		USA
7	CDC__CDC06pf2117		USA
8	CDC__9711-184	CDC_	USA
9	CDC__CDC06pf2123		USA
10	CDC__06pf2113	CDC_	USA
11	CDC__06pf2117	CDC_	USA
12	CDC__06pf2123	CDC_	USA
13	CDC__10348	CDC_	USA
14	CDC__10343	CDC_	USA
15	CDC__10347	CDC_	USA
16	CDC__10355	CDC_	USA
17	CDC__9702-53	CDC_	USA
18	CDC__9705-66	CDC_	USA
19	CDC__9706-46	CDC_	USA
20	CDC__06pf2115	CDC_	USA

# Compare One Pattern to Others

The screenshot shows the 'Comparison' software interface. The main window displays a comparison of patterns, with a 'Dendr...' view on the left and 'Experiment data' and 'Information fields' on the right. A dialog box titled 'Copy conversion settings from fingerprint type' is overlaid on the main window, asking 'Do you want to use the existing similarity matrix for 'PFGE-XbaI'?'. The dialog has three buttons: 'Yes', 'No', and 'Cancel'. A yellow arrow points to the 'Yes' button.

Index	Key	LabID	SourceCoun...
			USA
27	CDC__10344	CDC__	
28	CDC__10345	CDC__	
29	CDC__10347	CDC__	USA
30	CDC__10348	CDC__	USA
31	CDC__10355	CDC__	USA
32	CDC__10356	CDC__	

**If this screen appears, click "Yes"**

# Compare One Pattern to Others

**Comparison**

File Edit Layout Groups Clustering Dimensioning Bandmatching Characters Sequence TrendData Composite Window

PFGE-Xbal

Experi...  
PFGE-Blnl  
PFGE-Spel  
PFGE-Xbal  
antibio  
biochem

Dend... Experiment data Information fields Similarities

PFGE-Xbal

**% Similarity**

Index	Key	LabID	SourceCo	% Similarity
1	CDC__9711-184	CDC_	USA	100.0
2	CDC__9711-156	CDC_	USA	100.0
3	CDC__9712-61	CDC_	USA	100.0
4	CDC__9901-57	CDC_	USA	100.0
5	CDC__9702-53	CDC_	USA	97.1
6	CDC__9801-40	CDC_	USA	97.1
7	CDC__9908-6	CDC_	USA	94.1
8	CDC__9804-63	CDC_	USA	91.4
9	CDC__9801-35	CDC_	USA	89.5
10	CDC__9712-10	CDC_	USA	83.3
11	CDC__10342	CDC_	USA	76.5
12	CDC__10344	CDC_		74.3
13	CDC__10355	CDC_	USA	70.6
14	CDC__06pf2117	CDC_	USA	68.8
15	CDC__10347	CDC_	USA	68.8
16	CDC__CDC06pf2115		USA	68.8
17	CDC__06pf2123	CDC_	USA	68.8

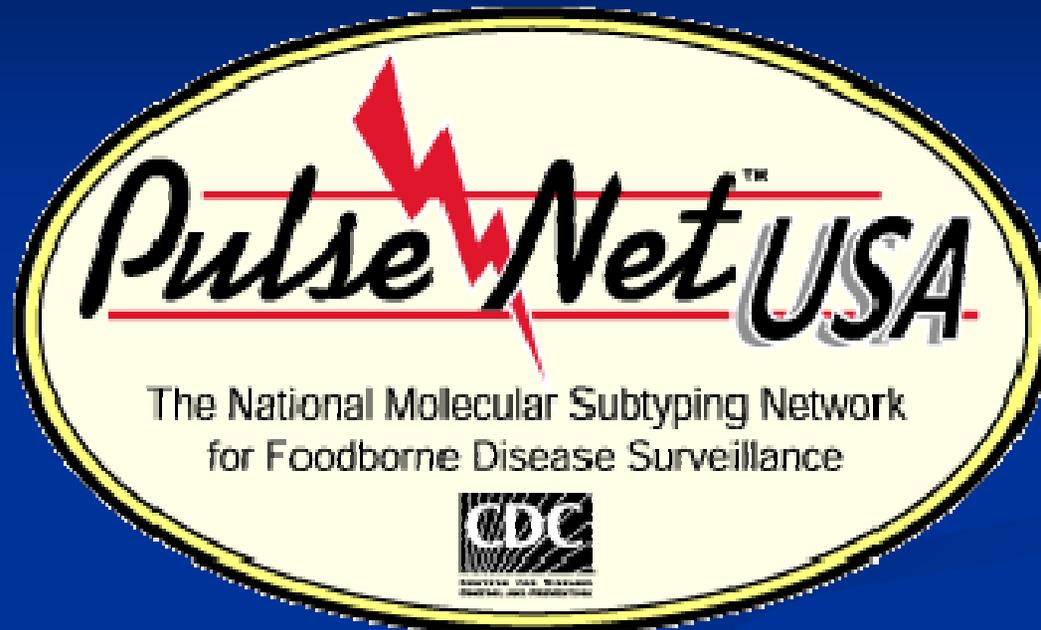
**Now, your patterns are arranged by decreasing similarity to the pattern you selected**

# REMINDER:

The Computer is Just a Tool

Your Eyes Always Determine  
Whether Patterns are  
Indistinguishable or Different

# 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

# Exercise 4