

PulseNet MasterScripts and Database Management Tools



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BioNumerics/PulseNet MasterScripts Overview

The screenshot shows the BioNumerics software interface. At the top, there is a banner with the 'APPLIED MATHS' logo and the 'BioNumerics' logo. Below the banner, there are four numbered boxes: 1., 2., 3., and 4. The main window displays a list of databases with columns for 'Database', 'Last', and 'Path'. A callout box highlights the first four rows of the database list. Another callout box lists four actions: 1. Open database, 2. Create new database, 3. Delete database or change settings, and 4. Exit BioNumerics. A third callout box points to the database list with the text 'Databases that you've created'.

1. 2. 3. 4.

Version 5.00

Database	Last	Path
Campylobacter	200	
DemoBase	201	
Demobase 2D	200	
DemoBase 2D gels	200	
Ecoli	2010-02-04 09:42	[HOMEDIR]\Ecoli
Listeria	2009-09-29 16:26	[HOMEDIR]\Listeria
MTDC Campy Admin	2010-03-17 13:48	[HOMEDIR]\MTDC Campy Adr
MTDC Ecoli Admin		[HOMEDIR]\MTDC Ecoli Admin
MTDC Listeria Admin		[HOMEDIR]\MTDC Listeria Adr
MTDC Salmonella Adr		[HOMEDIR]\MTDC Salmonella .
MTDC Shigella Admin		[HOMEDIR]\MTDC Shigella Adr
Non 0157		[HOMEDIR]\Non 0157
Salmonella		[HOMEDIR]\Salmonella
Sflexneri	2010-04-16 12:02	[HOMEDIR]\Sflexneri
Shigella	2010-03-22 14:22	[HOMEDIR]\Shigella
test Sflexneri	2010-04-27 09:42	[HOMEDIR]\test Sflexneri
test shigella client		

**1. Open database
2. Create new database
3. Delete database or change settings
4. Exit BioNumerics**

Databases that you've created

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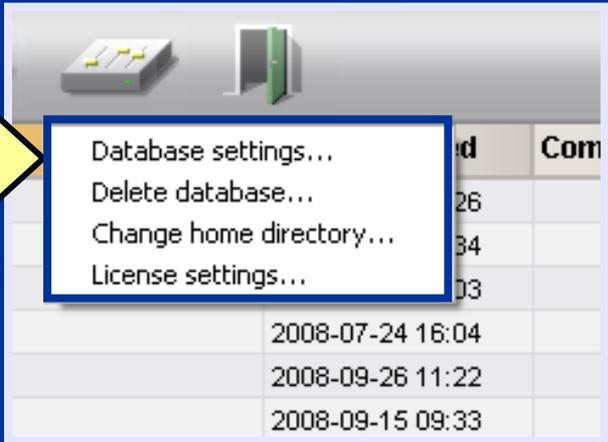


Settings Menu



Settings drop down menu appears

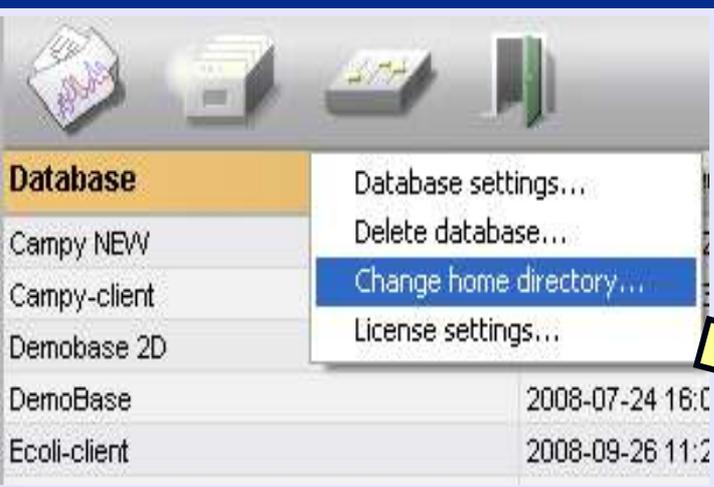
Click "Settings"



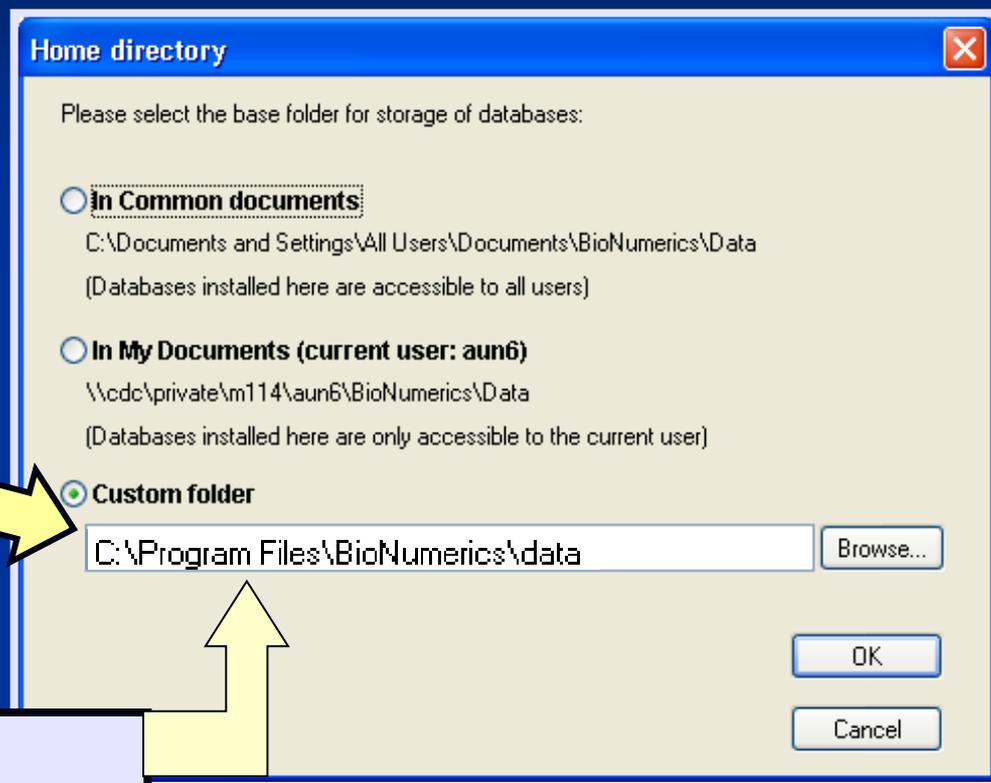
Database	Last accessed	Comment	Path
Campylobacter	2009-02-13 12:43		[HOMEDIR]\Campylobacter
DemoBase	2001-04-09 09:37		[HOMEDIR]\DemoBase
Demobase 2D	2008-12-14 14:27		[HOMEDIR]\Demobase 2D
DemoBase 2D gels	2008-12-14 14:48		[HOMEDIR]\DemoBase 2D gel
Ecoli	2010-03-17 09:42		[HOMEDIR]\Ecoli
Listeria			[HOMEDIR]\Listeria
MTDC			[HOMEDIR]\MTDC Campy Adr
MTDC			[HOMEDIR]\MTDC Ecoli Admin
MTDC Listeria Admin	2010-03-17 13:48		[HOMEDIR]\MTDC Listeria Adr
MTDC Salmonella Admin	2010-04-27 09:53		[HOMEDIR]\MTDC Salmonella .
MTDC Shigella Admin	2010-04-27 09:09		[HOMEDIR]\MTDC Shigella Adi
Non 0157	2009-12-09 11:29		[HOMEDIR]\Non 0157
Salmonella	2010-03-23 15:27		[HOMEDIR]\Salmonella
Sflexneri	2010-04-16 12:02		[HOMEDIR]\Sflexneri
Shigella	2010-03-22 14:22		[HOMEDIR]\Shigella
test Sflexneri	2010-04-27 09:42		[HOMEDIR]\test Sflexneri
test shigella client			



Settings: Directory Location



Database	
Campy NEW	
Campy-client	
Demobase 2D	
DemoBase	2008-07-24 16:0
Ecoli-client	2008-09-26 11:2



Home directory

Please select the base folder for storage of databases:

- In Common documents
C:\Documents and Settings\All Users\Documents\BioNumerics\Data
(Databases installed here are accessible to all users)
- In My Documents (current user: aun6)
\\cdc\private\m114\ aun6\BioNumerics\Data
(Databases installed here are only accessible to the current user)
- Custom folder
C:\Program Files\BioNumerics\data

Browse... OK Cancel

Default Directory

This is the directory location of your BioNumerics database. You can change this location when necessary.

What are PulseNet MasterScripts?

- Customizations in BioNumerics for PulseNet participants
- Developed by CDC and Applied Maths; highly customized for each national database
- Scripts install Reference systems (H9812), pick lists, fields, and other functions within BioNumerics so that data is standardized and comparable among participating laboratories
- Updated MasterScripts CDs are issued to PulseNet participating laboratories



BioNumerics/PulseNet MasterScripts Overview

PulseNetTM USA
The National Molecular Subtyping Network
for Foodborne Disease Surveillance
CDC
Centers for Disease
Control and Prevention

Isolates: 2397
PFGE-BlnI patterns: 424
PFGE-SpeI patterns: 5
PFGE-XbaI patterns: 2149

1. ScriptVersion 5.01
2. Salmonella
3. CDC_

OK

**# of isolates
in the
database**

**1.MasterScripts
version
2.Database
3.Lab ID**

Select "OK" to open database

BioNumerics: Main Window

1. Menu and Toolbar

2

3

4

6

7

8

9

5

The screenshot shows the BioNumerics main window with the following components highlighted by numbered callouts:

- 1. Menu and Toolbar:** The top menu bar (File, Edit, Database, Subsets, Experiments, Comparison, Identification, PulseNet, Scripts, Window) and the toolbar below it.
- 2:** A secondary toolbar containing various icons for data manipulation and analysis.
- 3:** The 'Database entries' table, which is the central data view.
- 4:** A specific row in the 'Database entries' table.
- 5:** The status bar at the bottom of the window, showing database and experiment counts.
- 6:** A grid of colored dots representing data points or relationships in the 'Database entries' table.
- 7:** The 'Experiments' table in the right-hand pane.
- 8:** A specific row in the 'Experiments' table.
- 9:** The 'Comparisons' table in the right-hand pane.

Index	LabID	SourceCountry	SourceSta	1	2	3	4	5	6
1	FL ...		FL	.					
2	#48			.	.				
3	#48...			.	.				
4	00-...	TN	USA		.				
5	00-...	TN	USA		.				
6	00-...	TN	USA		.	.			
7	00-...	TN	USA		.	.	.		
8	00-...	TN	USA		.				
9	00-...	TN	USA		.	.			
10	00-...	TN	USA		.	.			
11	00-...	TN	USA		.	.			
12	00-...	TN	USA		.	.			
13	00-...	TN	USA		.	.			
14	00-...	TN	USA		.	.			
15	00-...	TN	USA		.	.			
16	00-...	Canada	LCDC	.					
17	00-...	TN	USA		.				
18	00-...	TN	USA		.				
19	00-...	TN	USA		.				
20	00-...	TN	USA		.				

Status bar: Database: Ecoli-client | 8115 entries | 6 experiments | \\cdc\proj\c\CCID_NCZVED_DFBMD_PulseNet\Data\Ecoli-client

9 Areas in the Main Window



2: PulseNet Lightning Bolt Tools

What: modifications to BioNumerics via MasterScripts for PulseNet participants

2

Click on far left edge and drag mouse downward to display lightning bolt tools vertically, as in previous versions of BioNumerics...

LabID	SourceCountry	SourceSta	1	2	3	4	5	6
1 FL ...		FL	•					
2 #48			•	•				
#48...			•	•				

Experiments

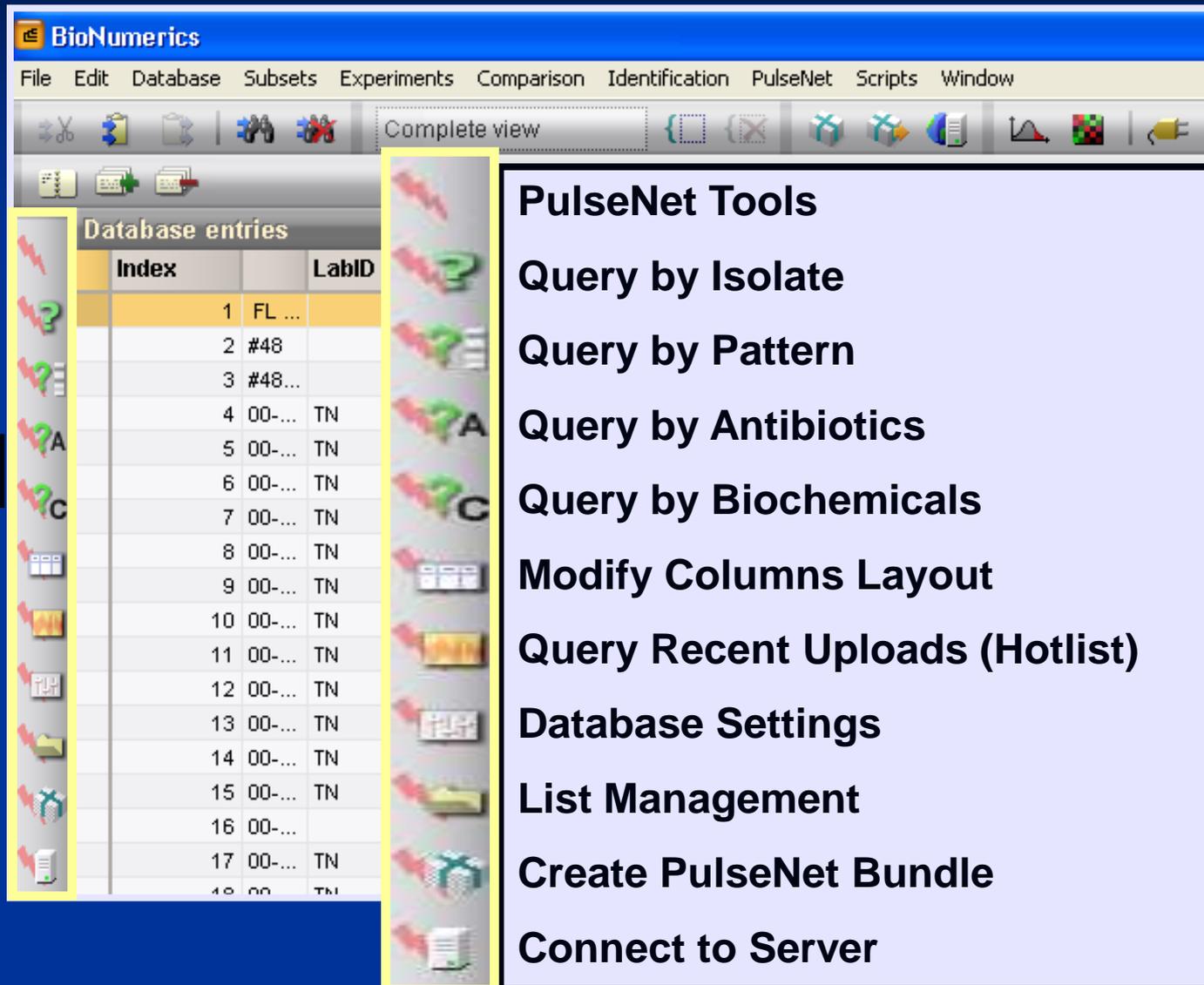
Name
1 PFGE-BlnI
2 PFGE-Spel
3 PFGE-Xbal

Files

Name

2: PulseNet Lightning Bolt Tools

2

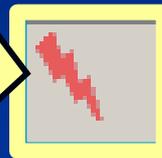
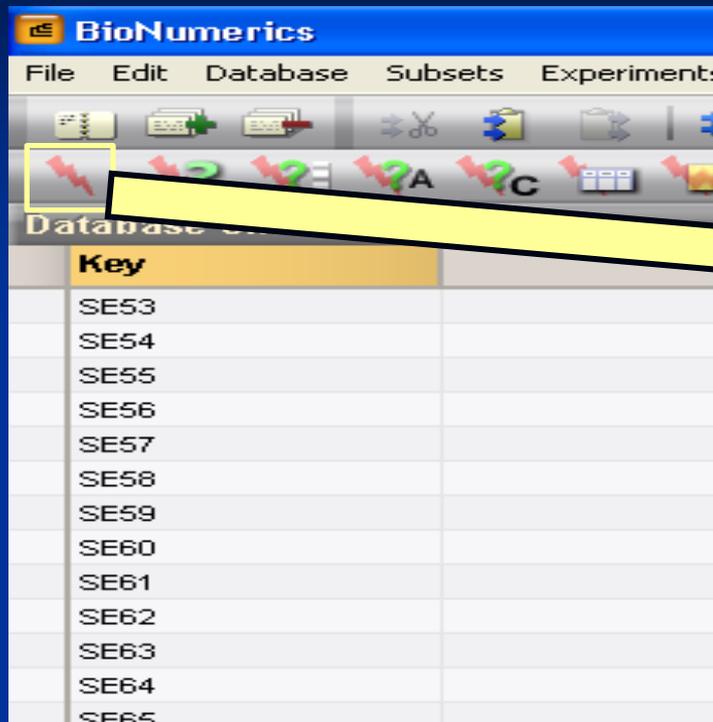


The screenshot shows the BioNumerics software interface. The title bar reads 'BioNumerics'. The menu bar includes 'File', 'Edit', 'Database', 'Subsets', 'Experiments', 'Comparison', 'Identification', 'PulseNet', 'Scripts', and 'Window'. The toolbar contains various icons for file operations and data analysis. The main window displays a table titled 'Database entries' with columns 'Index' and 'LabID'. The table contains 18 rows of data. To the left of the table is a vertical toolbar with icons for various PulseNet tools. To the right of the table is a list of PulseNet tools.

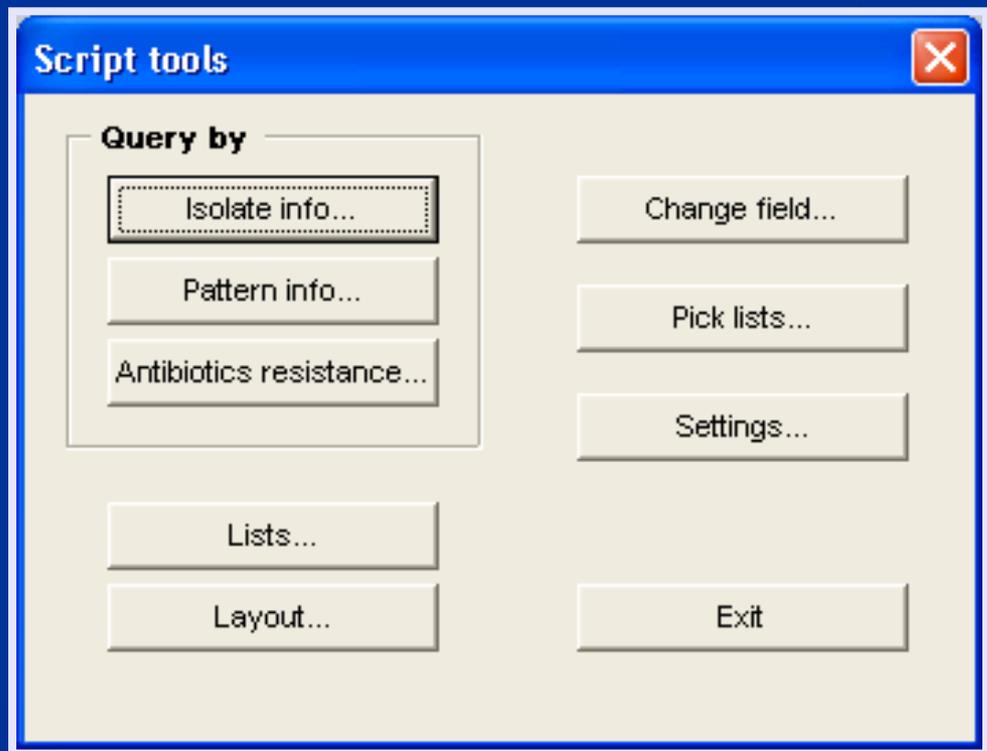
Index	LabID
1	FL ...
2	#48
3	#48...
4	00-... TN
5	00-... TN
6	00-... TN
7	00-... TN
8	00-... TN
9	00-... TN
10	00-... TN
11	00-... TN
12	00-... TN
13	00-... TN
14	00-... TN
15	00-... TN
16	00-...
17	00-... TN
18	00-... TN

- PulseNet Tools
- Query by Isolate
- Query by Pattern
- Query by Antibiotics
- Query by Biochemicals
- Modify Columns Layout
- Query Recent Uploads (Hotlist)
- Database Settings
- List Management
- Create PulseNet Bundle
- Connect to Server

2: PulseNet Lightning Bolt Tools



PulseNet Modified
Tools Shortcut



3: Database Field Names

3

BioNumerics

File Edit Database Subsets Experiments Comparison Identification PulseNet Scripts Window

Complete view

Database entries

Index	Key	LabID	SourceCountry	SourceState
1	FL			FL
2	#4			
3	#			
4			USA	TN
5	00	TN	USA	TN
6	00	TN	USA	TN
7	00	TN	USA	MO
8	00	TN	USA	TN
9	00	TN	USA	TN
10	00	TN	USA	TN
11	00	TN	USA	TN
12	00	TN	USA	TN
13	00	TN	USA	TN
14	00	TN	USA	TN
15	00	TN	USA	TN

All levels

Database: Ecoli-client

Entries 6 experiments \vcdc\project\CCID_NCVED_DFBMD_PulseNet\Data\Ecoli-client

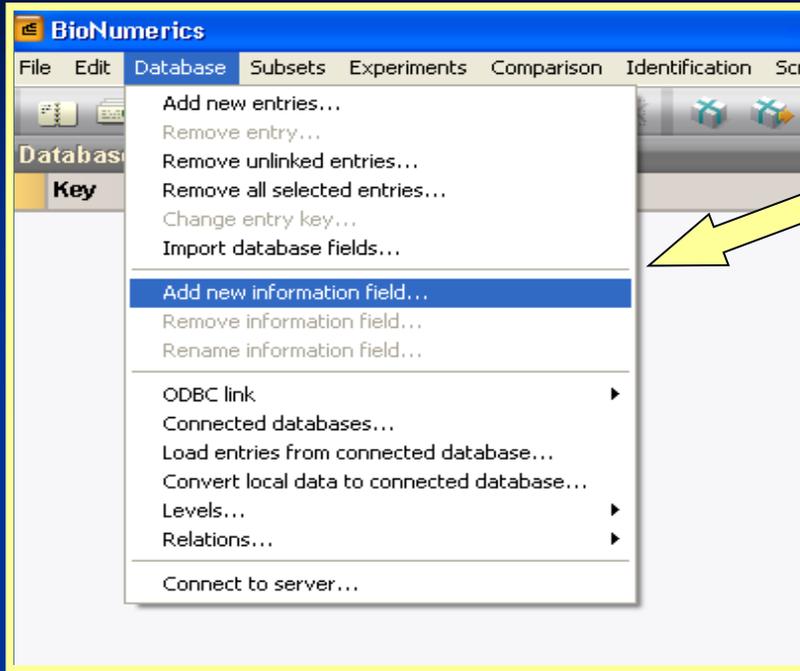
Compariso... Librari... Decision Net

- PulseNet field names are entered by running scripts
- “Key” is required to be in the database
- User can add and define additional field names

Database entries

Index	Key	LabID	Serotype	SourceCountry	SourceState
-------	-----	-------	----------	---------------	-------------

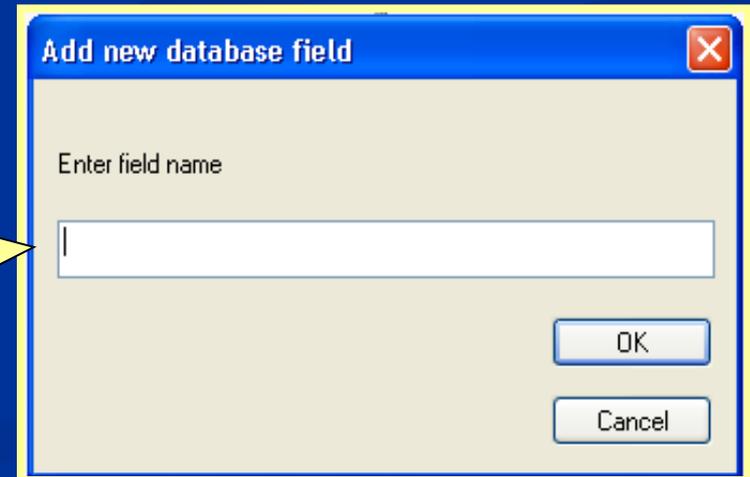
Adding Database Fields



To add additional database fields, select:

1. Database
2. Add new information field

Type the name of the new field into the entry window and select ok.



5: Status Bar

The screenshot shows the BioNumerics software interface. The status bar at the bottom of the window displays the following information:

5 Database: Ecoli-client 8115 entries 6 experiments C:\Program Files\BioNumerics\data

The status bar is divided into four sections labeled A, B, C, and D:

- A: Database Name (Ecoli-client)
- B: Number of Entries in Database (8115 entries)
- C: Number of Experiments in Database (6 experiments)
- D: Location on computer (C:\Program Files\BioNumerics\data)

Index	Key	LabID	SourceCountry	Source	1	2	3	4	5	6
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			•		•	•

5

A

B

C

D

Database: Ecoli-client 8115 entries 6 experiments C:\Program Files\BioNumerics\data

Aspects of the database:

A. Database Name

B. Number of Entries in Database

C. Number of Experiments in Database

D. Location on computer

6: Experiment Presence Panel

The screenshot shows the BioNumerics software interface. The main window is titled 'BioNumerics' and has a menu bar with 'File', 'Edit', 'Database', 'Subsets', 'Experiments', 'Comparison', 'Identification', 'PulseNet', 'Scripts', 'Help', and 'Window'. Below the menu bar is a toolbar with various icons. The main area is divided into two panes. The left pane, titled 'Database entries', contains a table with the following data:

Key	LabID	SourceCountry	SourceState	Source
08-78	08-78	USA	PR	
08-80	08-80	USA	PR	
08-81	08-81	USA	PR	

The right pane, titled 'Experiments', contains a table with the following data:

	Name	Type
1	PFGE-Blnl	Fingerprint types
2	PFGE-Spel	Fingerprint types
3	PFGE-Xbal	Fingerprint types

Below the 'Experiments' table is a grid with columns numbered 1 to 6. Orange dots are present in the grid, indicating the presence of experiments for each entry. A large black box with the number '6' is overlaid on the grid.

This is a close-up view of the 'Experiment Presence Panel' from the previous screenshot. It shows the grid with columns 1 to 6 and rows corresponding to the database entries. Orange dots are visible in the grid, indicating the presence of experiments. A large black box with the number '6' is overlaid on the grid. The 'Experiments' table is also visible, showing the names and types of the experiments.

- For each entry, shows whether an experiment is available (orange dot) or not
- The numbers are linked to the experiment type

7: Experiment Types Panel

The screenshot shows the BioNumerics software interface. The 'Experiments' panel is highlighted with a black box containing the number 7. The 'Database entries' table is as follows:

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

The 'Experiments' table is as follows:

Name	Type
1 PFGE-Blnl	Fingerprint types
2 PFGE-Spel	Fingerprint types
3 PFGE-Xbal	Fingerprint types

Shows different experiment types, and experiments that are defined under each type

Create New

Edit

Delete

Search for an Experiment type

8: Files Panel

The screenshot displays the BioNumerics software interface. The 'Experiments' panel is active, showing a list of three experiments: PFGE-Blnl, PFGE-Spel, and PFGE-Xbal. The 'Files' panel below it shows a list of files associated with the selected experiment, PFGE-Xbal. The file list includes PNC07214, JH07196, JH07197, JH08071, and KC080058. A callout box highlights the number '8' in the 'Files' panel, indicating the total number of files. Other callouts identify the 'Selected Experiment', 'Edit', 'Add new', and 'Delete' buttons. A large callout at the bottom states 'Shows the available files for the selected experiment'.

Name	Type
1 PFGE-Blnl	Fingerprint types
2 PFGE-Spel	Fingerprint types
3 PFGE-Xbal	Fingerprint types

Name	Created	Modified
PNC07214	2007-11-06 10:52	2007-11-06 10:52
JH07196	2008-01-08 15:42	2008-01-08 15:42
JH07197	2008-01-08 15:51	2008-01-08 15:51
JH08071	2008-04-24 10:17	2008-04-24 10:17
KC080058	2008-04-29 14:59	2008-04-29 14:59

9: Comparisons Panel

Create new

Delete

Search Comparisons

Open

9

Index	Key	LabID	SourceCountry	SourceState	1	2	3	4	5	6
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...			MO						
8	00-0...			TN						
9	00-0...			TN						
10	00-0...	TN	USA	TN						

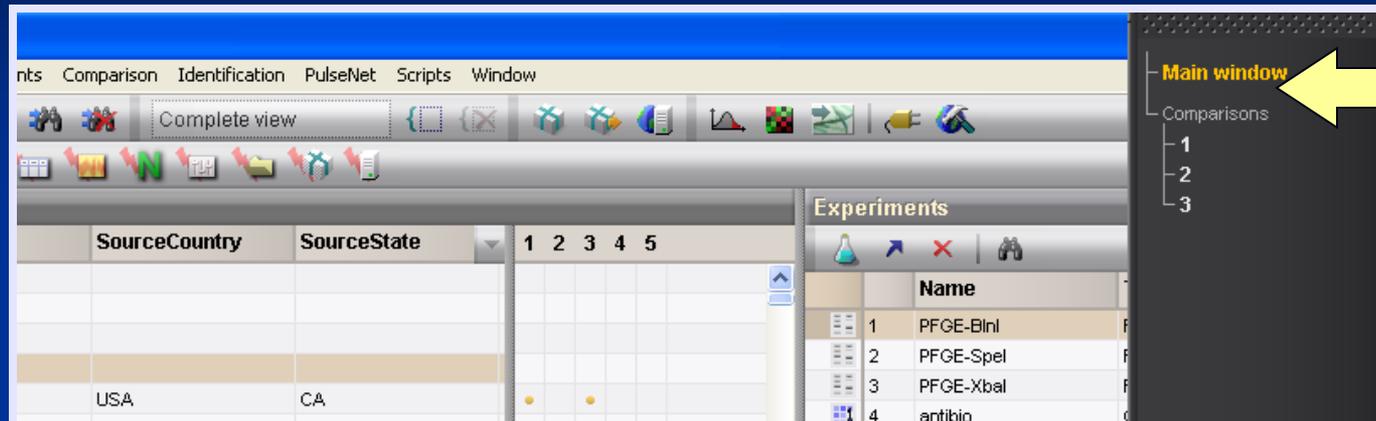
Name	Created	Modifi
test	2008-09-17 14h43m2...	2008-0

Name	Created	Mo
certification	2004-11-19 10h44m0...	200
comp A	2006-12-05 12h12m5...	200

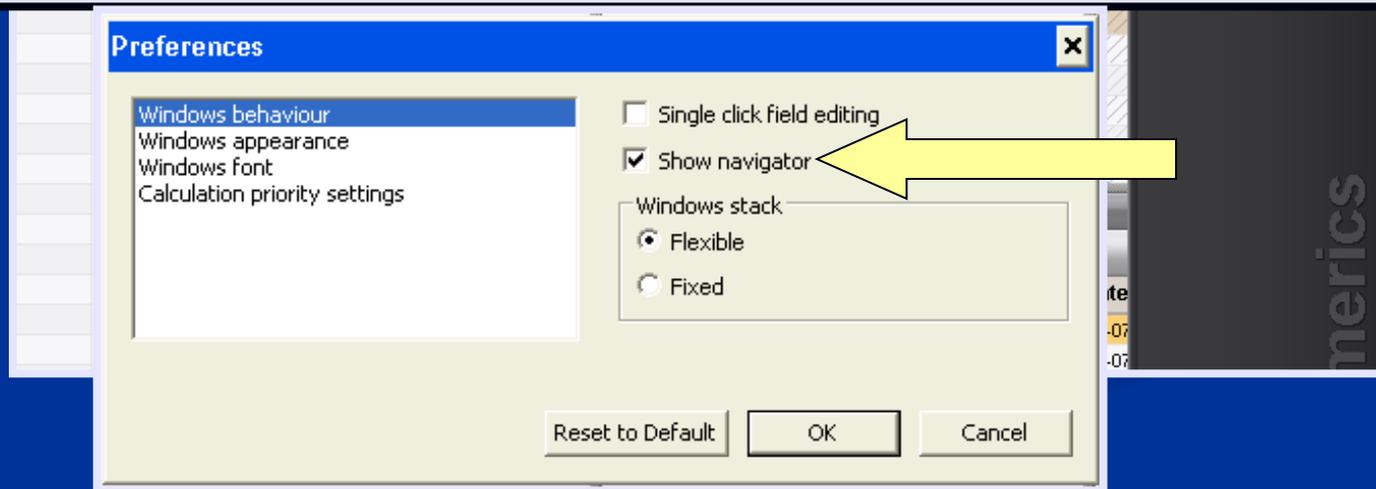
Compariso... Librari... Decision Networ... Alignmen...

Lists all comparisons that have been saved

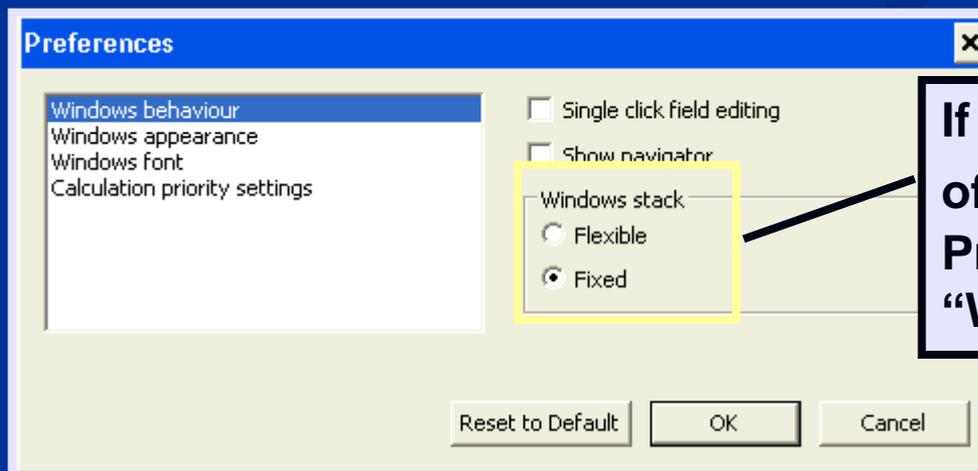
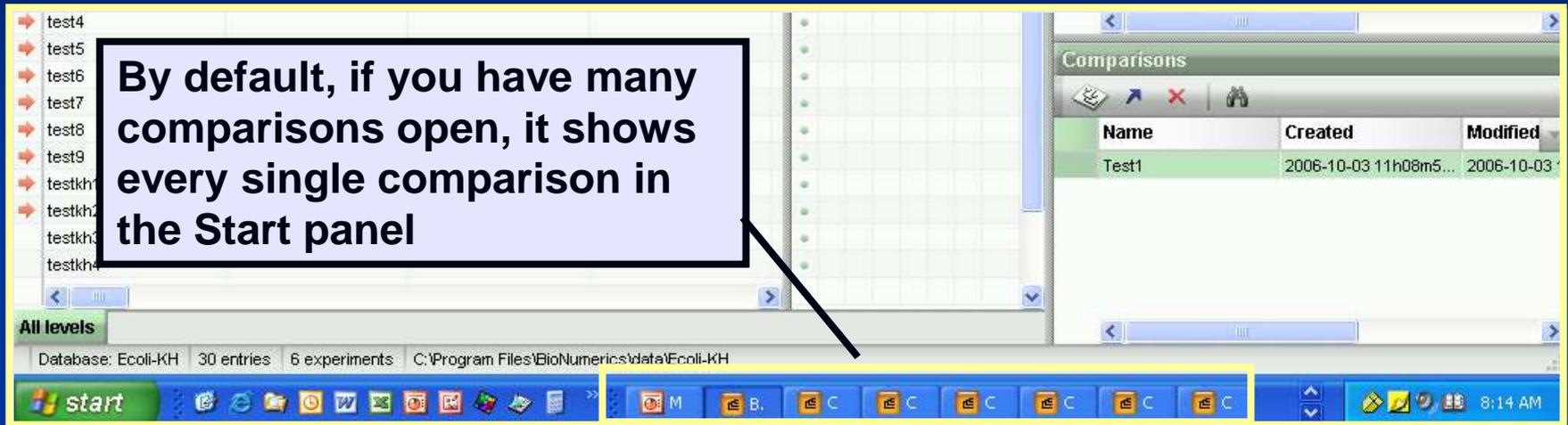
BioNumerics 5.0



The BioNumerics Navigator allows you to see multiple levels at once; however, if you want to turn it off, go to **File** → **Preferences** and switch off “Show Navigator” in the “Windows behavior”



BioNumerics 5.0



If you do not want to see all of them, Go to File→ Preferences and change "Window stack" to "Fixed"

BioNumerics Limits

- Numerical limitations for various features in BN:
 - Max. number of bundles: 500
 - Max. number of comparisons: 1000
 - Max. number of entries in a single comparison: 10,000
 - Max. number of fields that can be listed: 150

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

