



BIONUMERICS®

version 8 - PLUGINS



Fingerprint processing reports plugin

Contents

1	Starting and setting up BIONUMERICS	5
1.1	Startup program	5
1.2	Installing the Fingerprint processing reports plugin	6
2	Fingerprint reports	9
2.1	Print TIFF image	9
2.2	Print curve	10
2.3	Show normalization vector	11

NOTES

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- Unicycler version 0.5.0, <https://github.com/rrwick/Unicycler/releases> *
- Velvet for Windows, source code can be downloaded from <https://www.bionumerics.com/download/open-source>
- Bowtie2 version 2.2.5 (<https://bowtie-bio.sourceforge.net/bowtie2/index.shtml>)*
- SNAP version 2.0.0, <https://www.microsoft.com/en-us/research/project/snap/>
- RAxML version 8.2.11, <https://github.com/stamatak/standard-RAxML/releases>

- FastTree version 2.1.10, <https://www.microbesonline.org/fasttree/>
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- SeqSero2 for Windows, source code can be downloaded from <https://www.bionumerics.com/download/open-source>
- Fastp version 0.22.0, <https://github.com/OpenGene/fastp>

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Chapter 1

Starting and setting up BIONUMERICS

1.1 Startup program

Make sure the latest version of BIONUMERICS is installed (<https://www.bionumerics.com/download/software>). The installation manual can be downloaded from <https://www.bionumerics.com/download/manuals>.

When BIONUMERICS is launched from the Windows start panel or when the BIONUMERICS shortcut () on your computer's desktop is double-clicked, the **Startup program** is run. This program shows the *BIONUMERICS Startup* window (see Figure 1.1).

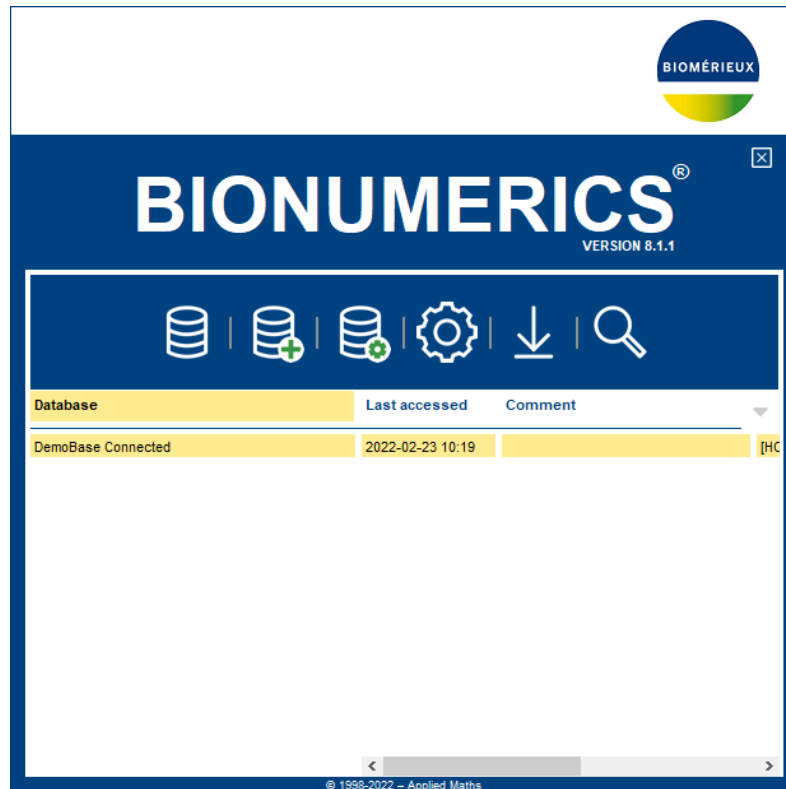





Figure 1.1: The *BIONUMERICS Startup* window.

A new BIONUMERICS database is created from the Startup program by pressing the  button.

An existing database is opened in BIONUMERICS with  or by simply double-clicking on a database name in the list.

1.2 Installing the Fingerprint processing reports plugin

The *Plugins and Scripts* dialog box can be called from the *Main* window by selecting **File > Install / remove plugins...** () (see Figure 1.2).

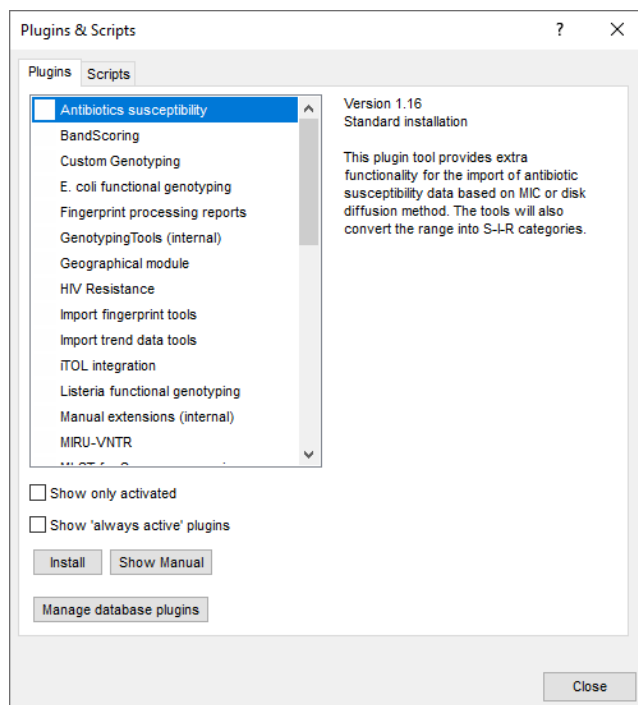


Figure 1.2: The *Plugins and Scripts* dialog box.

When a particular plugin is selected from the list of plugins, a short description appears in the right panel.

A selected plugin can be installed with the **<Install>** button. The software will ask for confirmation before installation. Some plugins are only supported in specific BIONUMERICS configurations. If the plugin is not supported by your BIONUMERICS configuration, it cannot be installed and an error message will be generated.

Once a plugin is installed, it is marked with a green V-sign. It can be removed again with the **<Uninstall>** button.

If the selected plugin is documented, pressing **<Show Manual>** will open its manual in the *Help* window.

- 2.1 To install the *Fingerprint processing reports plugin* in your database select the *Fingerprint processing reports plugin* from the list of plugins.
- 2.2 Press the **<Install>** button, confirm the installation of the plugin and close the *Plugins and Scripts* dialog box.
- 2.3 Close and reopen the database to activate the features of the *Fingerprint processing reports plugin*.

The *Fingerprint processing reports plugin* installs menu items in the *Fingerprint processing* window.

The *Fingerprint processing reports plugin* is supported in all configurations except the **BIONUMERICS-SEQ** configuration.

Chapter 2

Fingerprint reports

2.1 Print TIFF image

With the **Print TIFF image fingerprint processing report tool**, a gel image can be exported from the *Fingerprint processing* window. The image can be printed or pasted into another application.

- 1.1 Open a fingerprint file that has already been processed by double-clicking on the file in the *Fingerprint files* panel.
- 1.2 Choose **File > Edit fingerprint data...** (📄) to open the *Fingerprint processing* window.
- 1.3 To launch the print tool, select **File > Print TIFF image**. This action will open the *Print gel image* dialog box (see Figure 2.1).

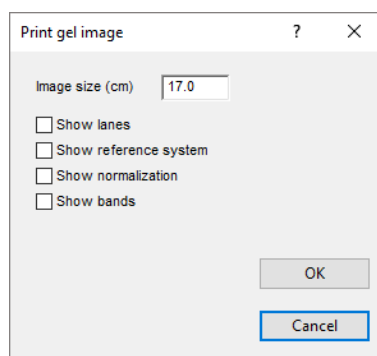


Figure 2.1: The *Print gel image* dialog box.

Following settings are prompted for:

- The **Image size** determines the maximum size without loss of resolution (in cm).
- The **Show lanes** option displays the blue lanes that represent the contours of the lanes, specified in the **Strips** step.
- The **Show reference system** option displays the reference positions defined in the *Normalization* step, along with the green lines indicating the positions across the gel. Reference bands are shown as white spots.
- The **Show normalization** option displays red lines showing the curvature of the gel, as determined by the reference band positions.

- The **Show bands** option displays band assignment from the *Bands* step as white spots on red dashes.

Pressing <OK> opens the *Screen image window* displaying the gel with the selected graphic overlays (see Figure 2.2).

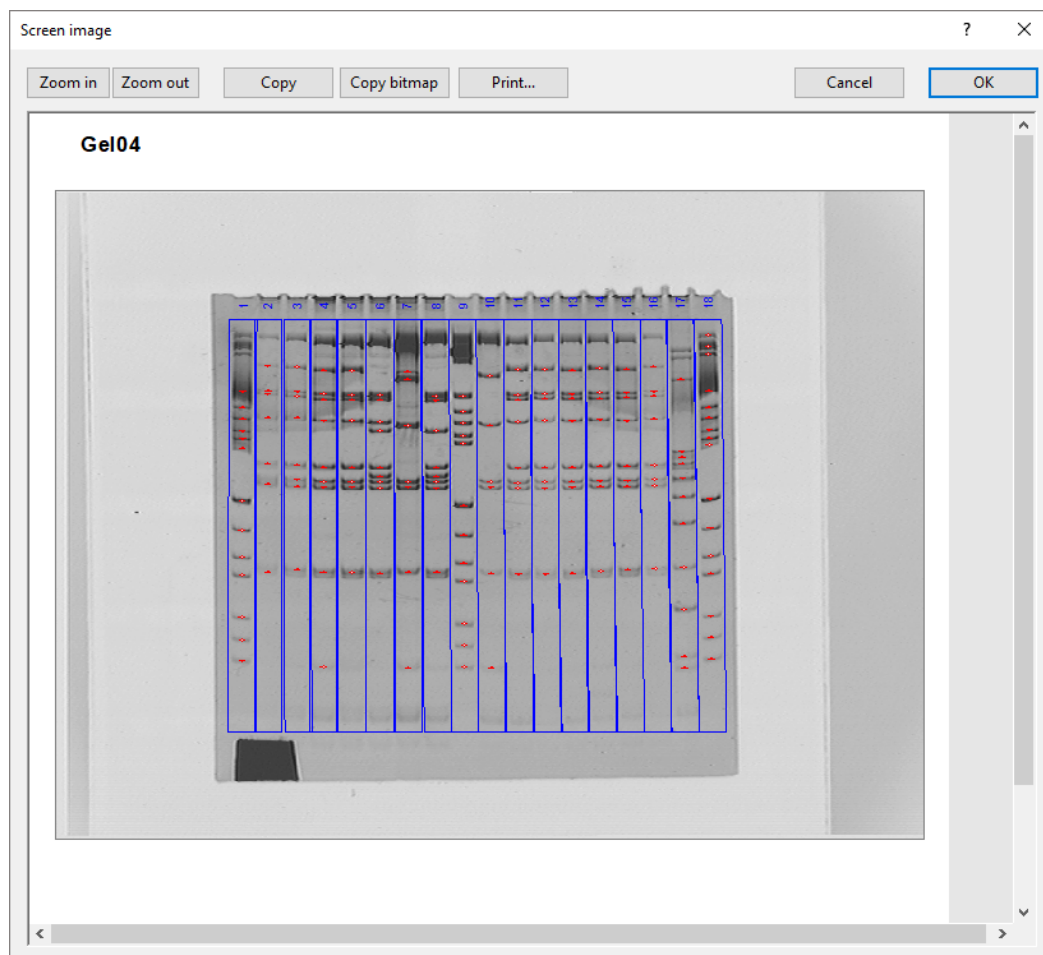


Figure 2.2: The *Screen image window*, displaying a TIFF gel image, the lanes and the bands.

The gel image can be copied to the clipboard as enhanced metafile (**Copy**) or bitmap (**Copy bitmap**), or printed (**Print**).

With the zoom buttons you can zoom in or out on the image.

To close the window press the <OK> button.

2.2 Print curve

With the **Print curve fingerprint processing report tool** a densitometric curve can be exported from the *Curves* step in the *Fingerprint processing* window.

2.1 Open a fingerprint file that has already been processed by double-clicking on the file in the *Fingerprint files* panel.

2.2 Choose **File > Edit fingerprint data...** (📄) to open the *Fingerprint processing* window.

2.3 Select a lane in the *Curves* step in the *Fingerprint processing* window to export.

2.4 To launch the print tool, select **Curves** > **Print curve**. This action will open the *Screen image window* (see Figure 2.3).

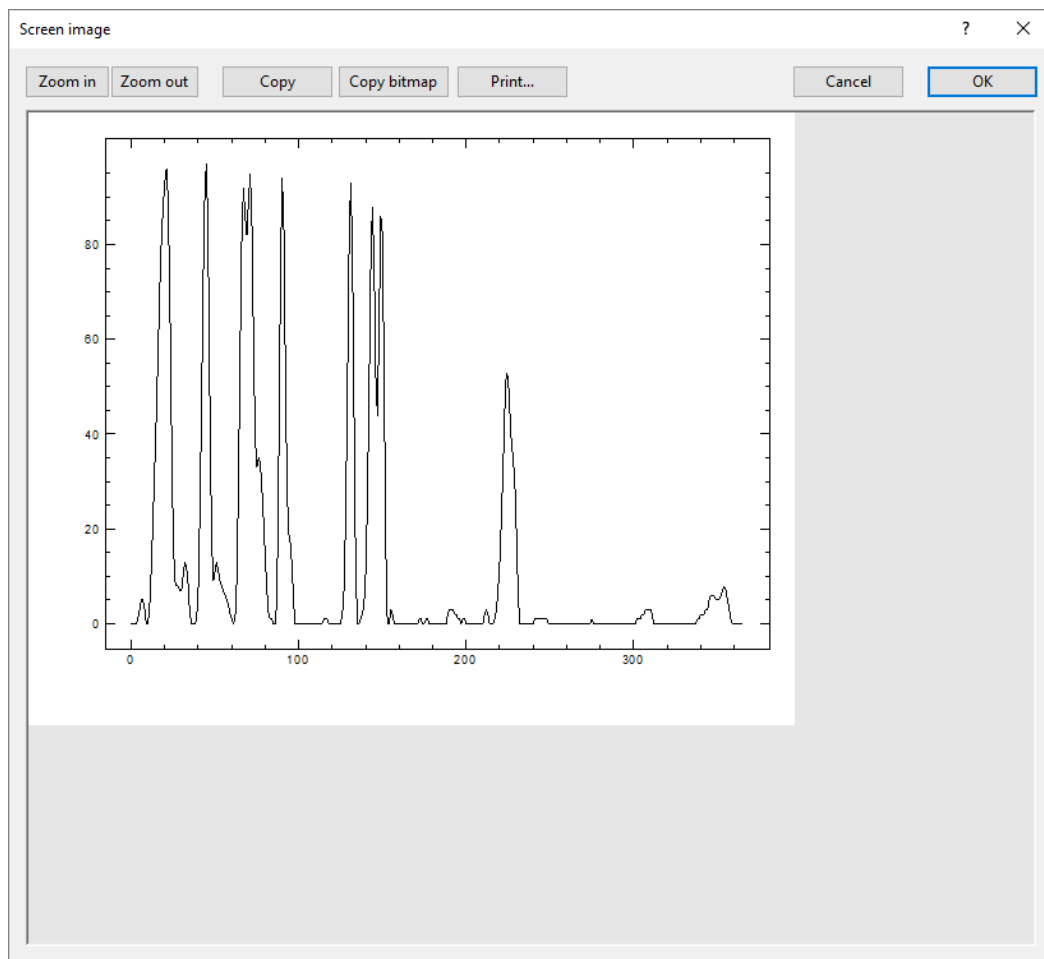


Figure 2.3: The *Screen image window*, displaying a densitometric curve.

The *Screen image window* displays the densitometric curve with optical density on the Y-axis and position on the X-axis.

The curve image can be copied to the clipboard as enhanced metafile (**Copy**) or bitmap (**Copy bitmap**), or printed (**Print**).

With the zoom buttons you can zoom in or out on the image.

To close the *Screen image window* press the <**OK**> button.

2.3 Show normalization vector

With the **Show normalization vector fingerprint processing tool**, a line graph showing the local distortion along a lane due to normalization can be exported. This tool is useful for demonstrating the relationship between position and gel distortion. For example: bands near the bottom of a gel are sometimes more variable in position than bands near the top.

3.1 Open a fingerprint file that has already been processed by double-clicking on the file in the *Fingerprint files* panel.

3.2 Choose **File > Edit fingerprint data...** (📄) to open the *Fingerprint processing* window.

3.3 Select a lane in the *Normalization* step in the *Fingerprint processing* window.

3.4 To launch the print tool, select **Normalization > Show normalization vector**. This action will open the *Screen image window* (see Figure 2.4).

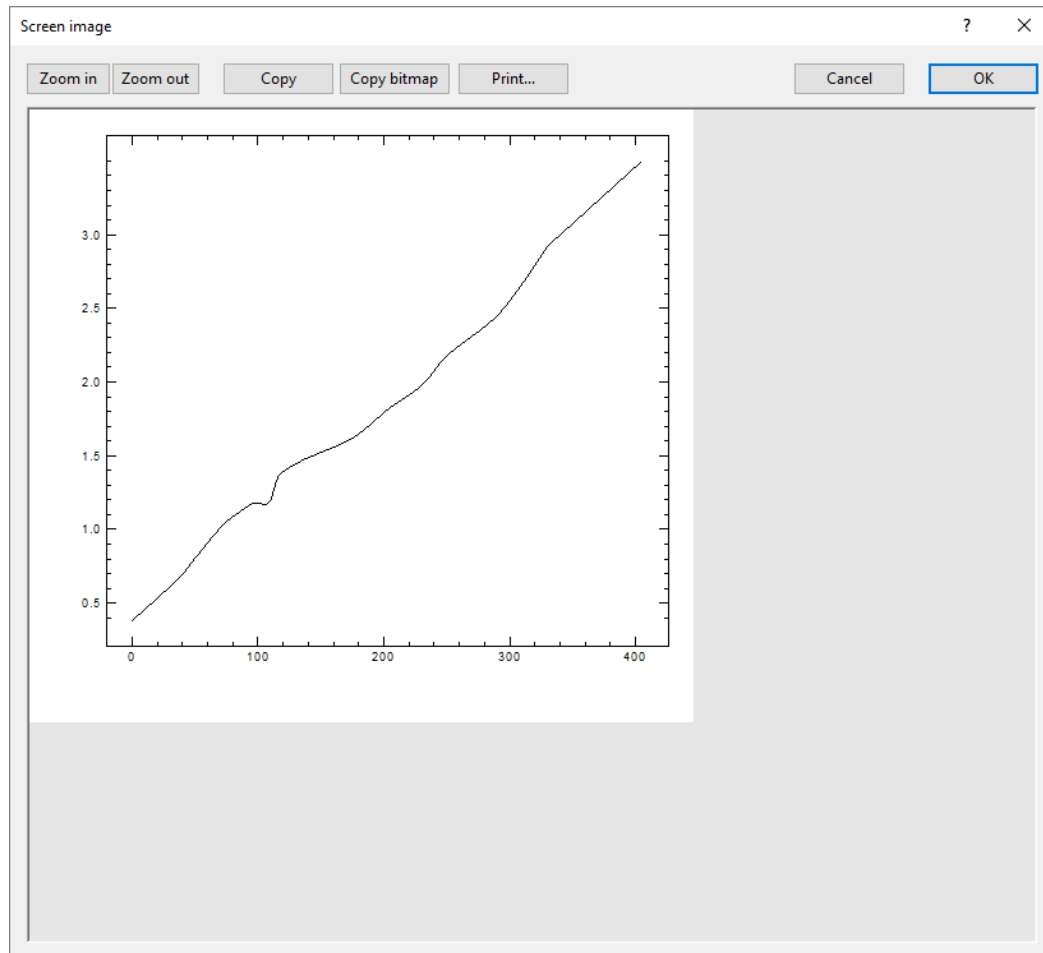


Figure 2.4: The *Screen image window*, displaying normalization vectors.

The *Screen image window* shows a graph of the amount of distortion along the selected lane, with normalized position (relative to the original position) on the Y-axis, and absolute position on the X-axis.

The image can be copied to the clipboard as enhanced metafile (**Copy**) or bitmap (**Copy bitmap**), or printed (**Print**).

With the zoom buttons you can zoom in or out on the image.

To close the *Screen image window* press the <**OK**> button.

