![BIOMÉRIEUX logo]

# BIONUMERICS Tutorial:

# Importing MLVA repeat numbers from a text file

## 1 Aims

This tutorial shows how to import MLVA repeat numbers from a text file as character data in a BIONUMERICS database. It illustrates the use of *import templates* in the software. Import templates specify from which external field – in a file or a database – information should be imported into which information field in BIONUMERICS (e.g. an entry field, character value or character experiment field).

## 2 Example data

The example text file from which we will import data in this tutorial contains MLVA repeat numbers for 4 loci for about 500 strains and can be downloaded from `https://www.applied-maths.com/download/sample-data` (click on "MLVA repeat numbers").

1. Open the file `MLVA repeat numbers.txt` to examine the data that will be imported (see Figure 1).



**Figure 1:** Text file with MLVA repeat numbers.

The text file contains for 500 isolates following information: a unique identifier ("Key"), the city where the strains originate from, and MLVA repeat numbers for 4 loci.

2. Close the text file again.

✎ Using the *MLVA plugin*, MLVA copy numbers can be determined in BIONUMERICS based on fingerprints, generated on capillary electrophoresis systems.

# 3 Creating a new character type

1. Create a new database (see tutorial "Creating a new database") or open an existing database.

Since we will be importing the repeat numbers as character data, we will first create a character type to hold this data. The steps below can be skipped if a suitable character type is already present in the database.

2. In the *Main* window, click on + in the toolbar of the *Experiment types* panel and select ***Character type*** from the list. Press <***OK***>.

The *New character type* wizard prompts you to enter a name for the new character type.

3. Enter a name, for example "MLVA" and press <***Next***>.

In the next step of the wizard, the choice is offered between ***Numerical values*** and ***Binary data***.

4. Choose ***Numerical values***.

5. Since we only want to use integer values, leave the number of decimal digits unaltered (zero). Press <***Next***>.

The wizard asks if the character type has an open (***Yes***) or closed (***No***) character set.

6. Answer ***No*** and make sure the ***Number of rows*** and ***Number of columns*** is set to zero.

7. Press the <***Finish***> button to complete the setup of the new character type.

The *Experiment types* panel now lists the new character type **MLVA**.

# 4 Import procedure

1. Select ***File*** > ***Import...*** ( , **Ctrl+I**) to open the *Import* dialog box.

2. Choose the option ***Import fields and characters (text file)*** under the ***Character type data*** item in the tree and press <***Import***> (see Figure 2).

3. Press <***Browse***> and browse for the downloaded `MLVA repeat numbers.txt` file (see Figure 3). Next, press <***Open***> and press <***Next***>.

As this is the first time we import character data from a text file into the database, we need to create a new import template by specifying ***Import rules***.

4. Select "Key" in the list and click <***Edit destination***> or simply double-click on "Key". Select "Key" as the BIONUMERICS destination field in the *Edit data destination* dialog box and press <***OK***>.

5. Select "City" in the list and click <***Edit destination***> or simply double-click on "City".

Since there is no field present yet in the database to hold this information, the database information field needs to be created first.

6. Select "<Create new>" under "Entry info field" and press <***OK***>.

7. In the dialog box that appears, press <***OK***> to accept the suggested name (by default the same of the corresponding column in the text file) and confirm this modification to the database with <***Yes***>.
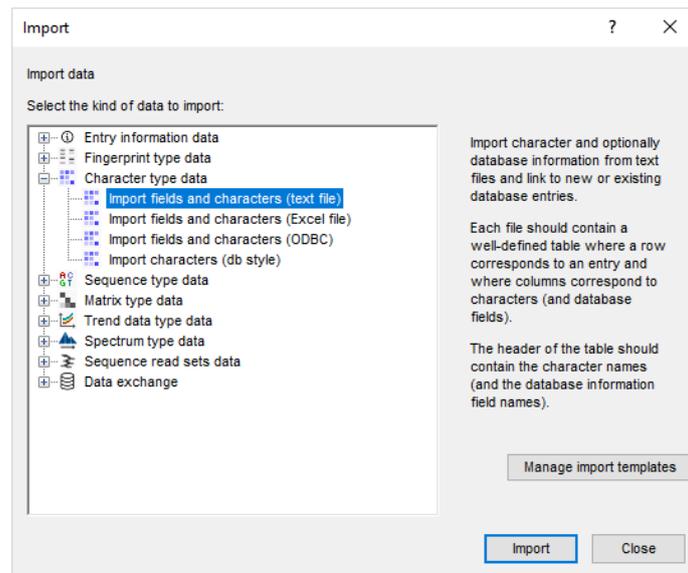
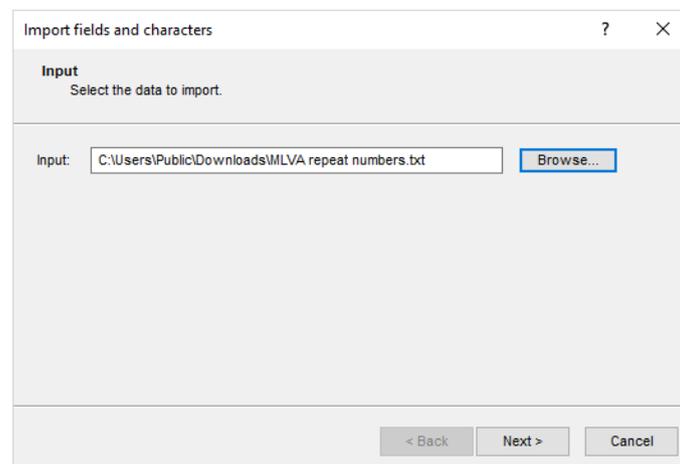**Figure 2:** The *Import* dialog box.



**Figure 3:** Select text file.

8. Make a multiple selection for all four loci. Do this by selecting "VNTR1" and while holding the **Shift**-key, click on "VNTR4". Press <***Edit destination***>, select the character type "MLVA" as destination under ***Character value*** and click <***OK***>.

9. Press <***OK***> and then <***Yes***> to confirm the creation of new characters.

The grid panel is updated (see Figure 4).

10. Press <***Preview***> to see what you are about to import.

11. Press the <***Close***> button to close the preview.

12. Press <***Next***> to proceed to the *Import links* dialog box.

13. Check "Key" under ***Import links*** and press <***Finish***>.

The import template needs to be saved to be able to use it again later on.

14. Enter a ***Name*** for the import template (e.g. "MLVA text file") and optionally a ***Description***. Next, press <***OK***>.
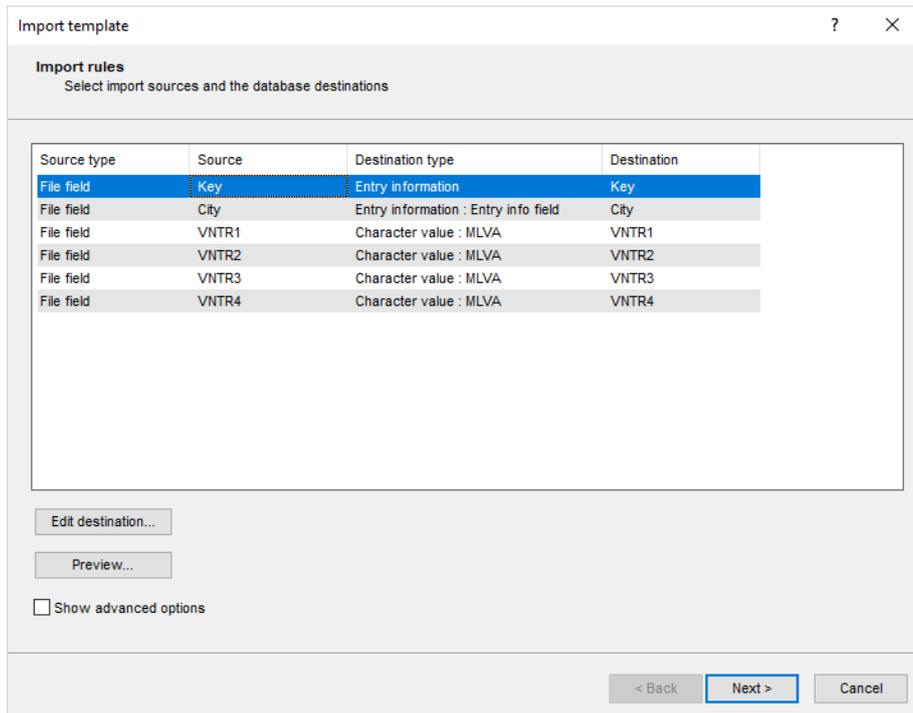
**Figure 4:** The import rules.

15. In the *Import template* wizard page, the new template is added and is automatically selected. Click <**Next**>.

In case there are no entries present with the same key as in the external file, the *Database links* wizard page will indicate that 500 new entries will be created during import (see Figure 5).
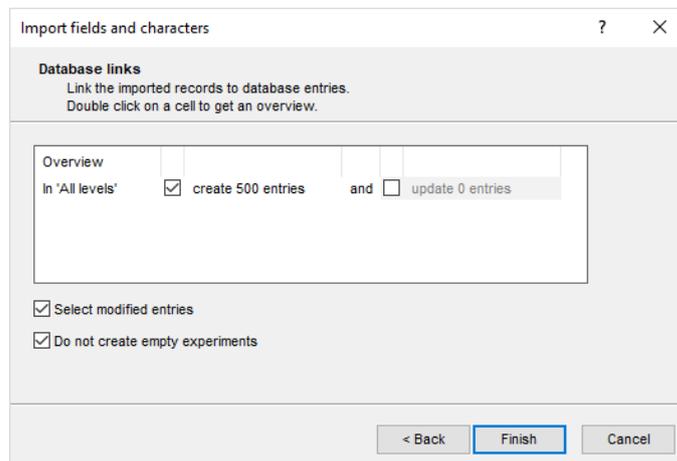


**Figure 5:** Create 500 new entries.

16. Press <**Finish**> to start the actual import. The progress of the import is shown while database information is added to the BIONUMERICS database.

The entries are displayed in the *Database entries* panel and all entries are automatically selected (see Figure 6). The character data is stored in the character type **MLVA**.

17. To view the values in a list, double-click on the experiment **MLVA** in the *Experiment types* panel, select **Settings** > **General settings...** ( ), select the *Experiment card* tab and change the representation to **List**. Close the two windows.
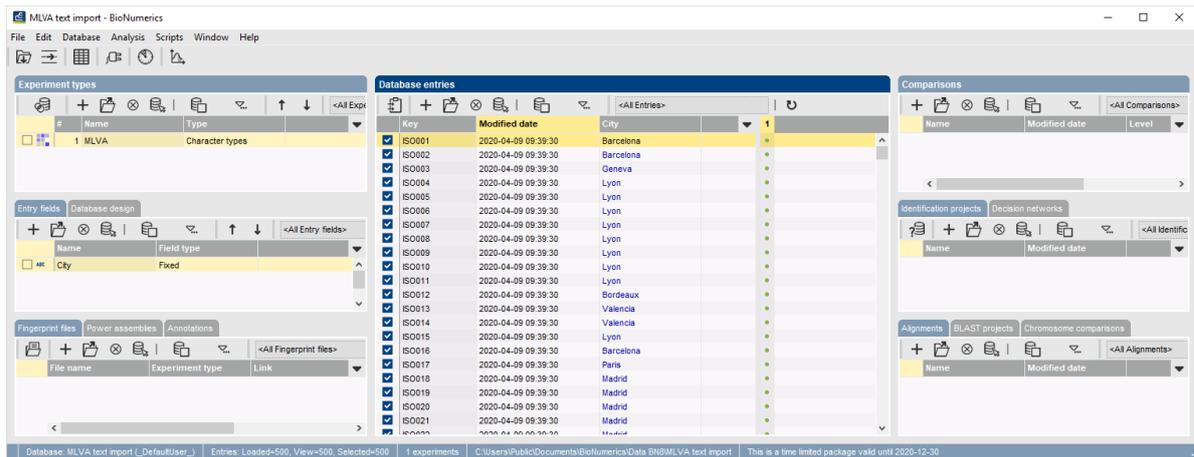
**Figure 6:** The *Main* window after import of the data.

18. Click on a green colored dot in the *Experiment presence* panel to open the experiment card for an entry.

The imported MLVA repeat numbers are displayed in the experiment card next to the corresponding locus name (see Figure 7).



**Figure 7:** The experiment card.

19. Close the experiment card by clicking in the left upper corner of the card.