Biomarker Integration Data Expert System

Getting Started v1.1

March 23, 2016

1 Installation

Biomarker Integration Data Expert System is distributed as a stand-alone Java application: it can be run on any modern system capable of running Java 8 runtime environment. Once you have downloaded the appropriate package for your operating system extract it to a directory of your choice, no additional software is required.

Then all you have to do is to execute **launcher** file:

- **Windows users:** Double click **launcher.cmd** file.

- **OS X users:** Double click **launcher.command** file (if you are using the software for the first time you have to right-click this file and choose "Open" from the context menu, then ignore warnings about unknown developer).

- **Linux users:** execute **launcher.sh** file from the command line.

In every case a command prompt window with textual output will open: do not close it while you are using the application or else it will quit.

If you are connected to the internet the application will check for updates. If any is available the window shown in Figure 1 will pop-up: in this case click *Install* button and then *Continue* when the update process is completed.

In case you are connecting to the internet through a proxy server, update checking operation will fail. To overcome this problem you will need to enter details about your proxy server in the file **config.txt**, located under directory **conf** (you can retrieve these informations from your IT service).
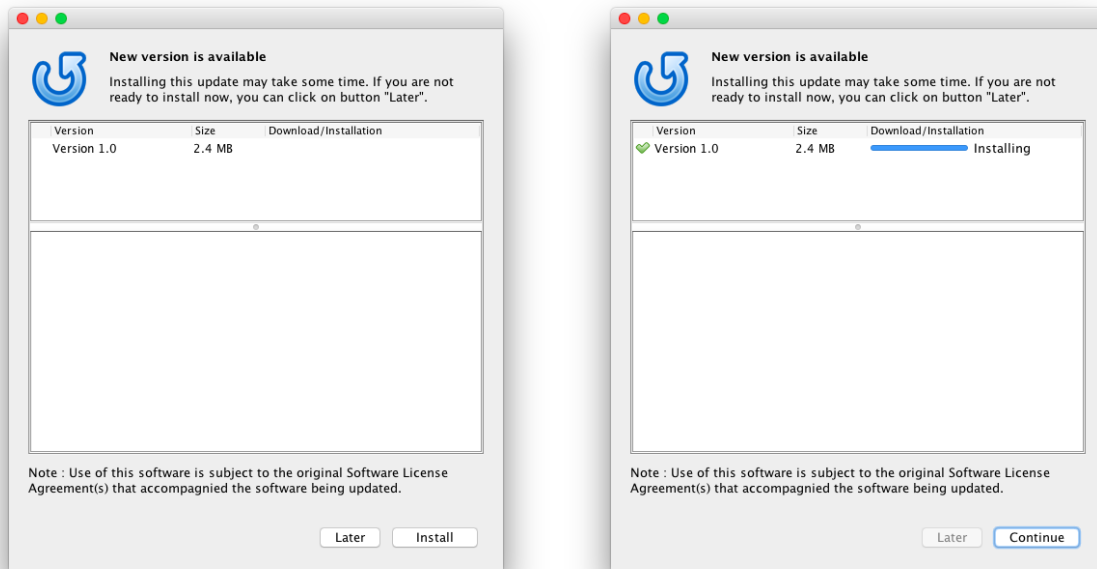
Figure 1: When updates are available this window will pop-up: choose *Install* and then
Continue.

2 Performing an analysis

From the welcome screen (Figure 2) you can choose to create a new analysis or open an
existing one. In the former case a pop-up window will appear, prompting you to select
which organism are you working with (currently **Mussel** and **Earthworm** are supported)
from a drop-down list or in the latter you'll need to select an **.exml** file containing the
analysis.

If you want to create a new analysis you'll be redirected to che **Analysis Info** tab:
from there you can enter a name for the new project and an optional description. When
you are done click **Save & continue**.

The **Biomarker** panel (Figure 3) allows you to select used biomarkers from the whole
database by ticking the relative checkbox on the left of their name, then select **Save &
continue**. Please remember that you can move between tabs freely at any time, but if
you perform modifications you need to click **Save** button to make them final.

Data input tab (Figure 4) is the place where to manage samples and enter data for
each biomarker. You need to add at least two of them: a control (whose values should
be all set to 100) and a treated. Samples can be managed from the left column and data
can be entered from the right one. Cellular level biomarkers are shown in green, tissue
level in yellow and organism ones in red. Just click on the value you wish to edit, set the
appropriate value from the panel above the table and then **Confirm**. Once you are done
choose **Compute results** and select the site to be used as a control from the drop-down
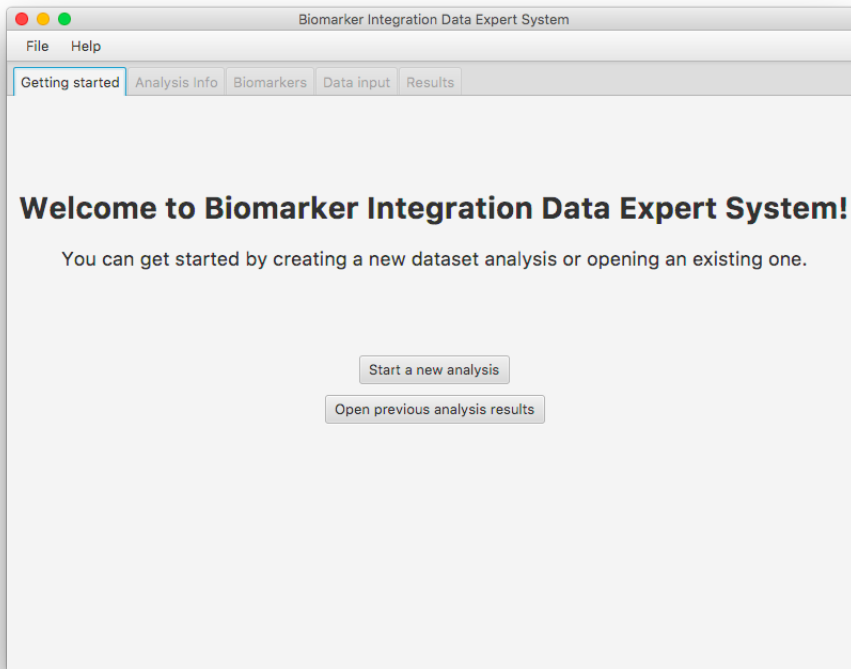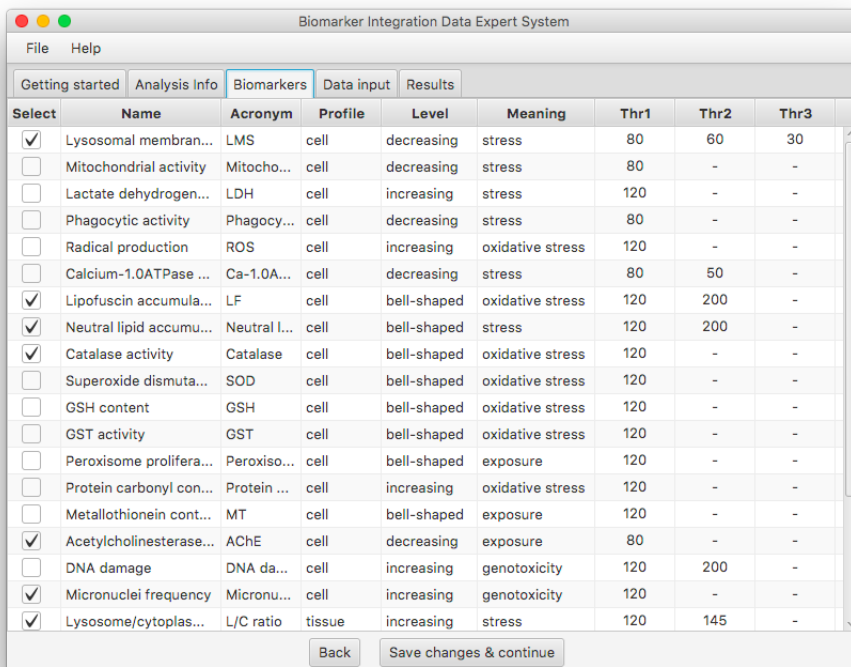
Figure 2: Expert System welcome screen.
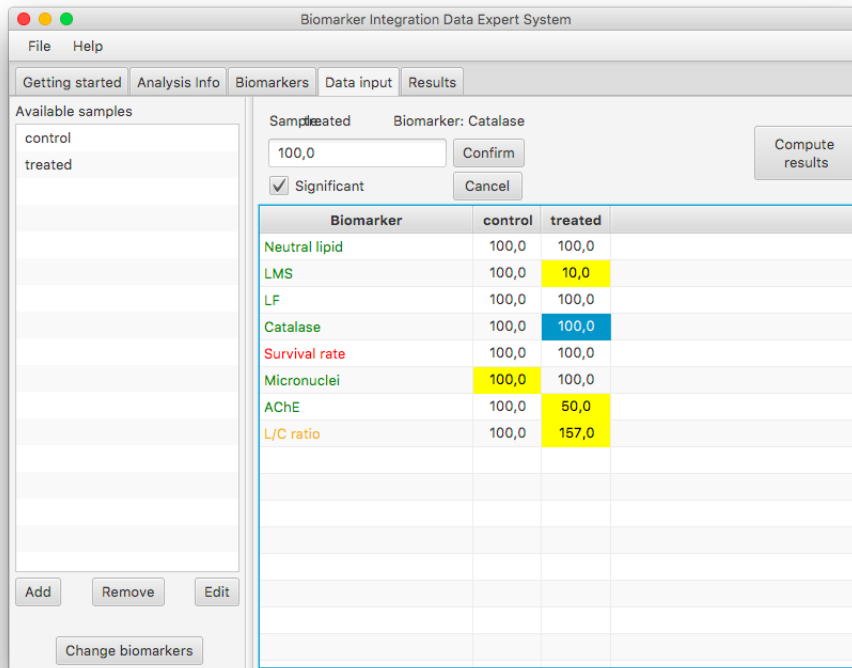

Figure 3: Biomarker selection tab.

Figure 4: Data input panel.

list.

Finally **Results** tab (Figure 5) displays analysis results for each sample: on the left column you can see the score associated to each sample and if you select one, on the right the status for each biomarker is displayed.

Biomarkers for which at least a threshold has been exceeded are displayed in bold font. Here is the meaning of the codes used:

- **OK**: biomarker has not exceeded any threshold.

- **NS**: value is set as not significant.

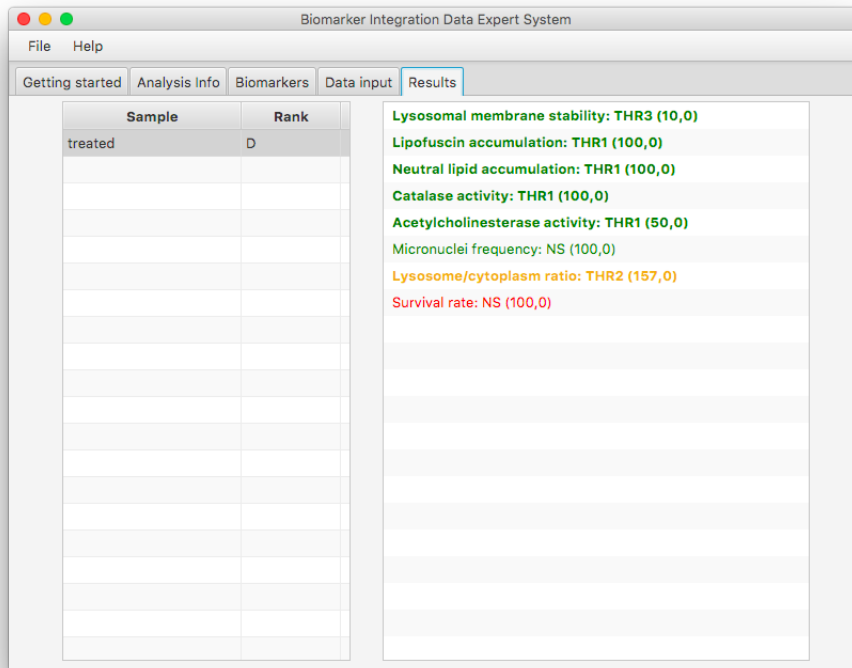- **THR1, THR2 or THR3**: biomarker has exceeded threshold 1, 2 or 3.

Figure 5: Results panel.

3 Adding custom biomarkers

In case you are using custom biomarkers that are not in default list you can add them to Expert System at any time. From **File** menu, choose **Manage custom biomarkers** (Figure 6). This operation cannot be performed while an analysis is loaded, so you will be prompted to save and close current one: if you save it you'll be able to load it later and eventually import new biomarker into it.

A table containing all your custom biomarkers will appear: from there you can choose to add new ones, delete some and then to save or discard changes (all modifications will be final only after you hit **Save changes** button).

When you choose to add a biomarker the window shown in Figure 7 will appear: enter your data (*acronym* should be a short unique identifier) and click **Create** to complete the operation (the new biomarker will immediately appear in the list but you need to hit **Save changes** in order to finalize its creation).

Once required biomarkers are created they are ready to be used in new or existing analyses. If you decide to share with others an analysis in which custom biomarkers are involved (by sharing the relative **.exml** file) they will become available to the other users too.

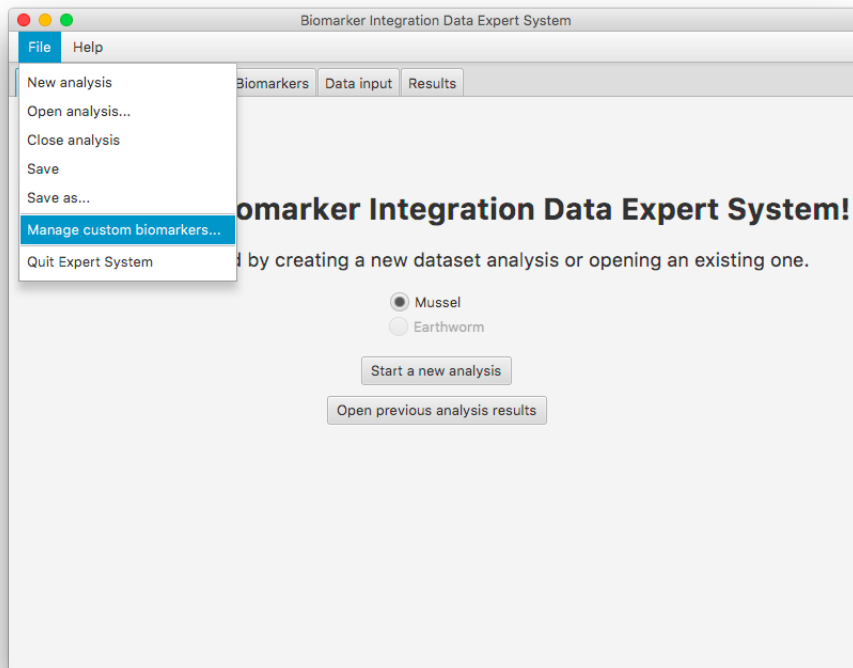Furthermore, if you delete a biomarker and then you load an old analysis in which it was
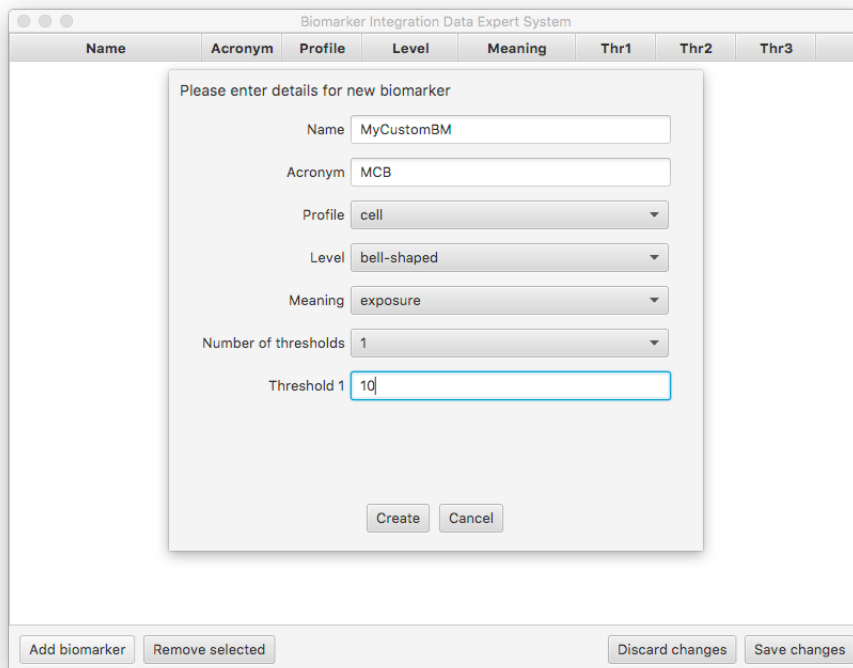
Figure 6: Open custom biomarker manger.

Figure 7: Add biomarker dialog.

involved it will become available again.

4 Contacts

Should you have any questions about Biomarker Integration Data Expert System please do not hesitate to contact us.

For general questions you can contact Prof. Aldo Viarengo (aldo.viarengo@uniupo.it) or Dr. Susanna Sforzini (susanna.sforzini@uniupo.it) or for technical ones about the Java application please contact Igor Saggese (igor.saggese@uniupo.it).