
**Institute of Mathematics and Computer Science
European Bioinformatics Institute**

**AIMS
User Guide**

Version 2.01

Accessing AIMS system

To access Assay Information Management System you need a valid login name and a password. If you think that you should have access to this page, but don't have login name/password you should contact the System Administrator.

Different users might have different access rights. Currently access rights are managed at *technology level* (the user can access only these Technologies access to which have been granted to him) and at *entry ownership* level - depending from ownership particular entries could be available either fully or partially or be hidden for a particular user. Also the access rights determine whether the user will be able to create new entries. If user has access to several Technologies, his access rights for different Technologies might be different.

There are several pages or other functionality of the system that might be unavailable or partially available to users without sufficient access rights.

First level (Experiments)

List of Experiments page allows to view/edit/delete data either for all Experiments currently in database, which are attributed to particular Technology, or Experiments contained within a particular Study (if Studies are configured for the given Technology). If your access rights doesn't allow to access a particular Experiment even in *view only* mode, only the value of Experiment ID will be shown, all other values will be replaced by **.

Selection of Technology

If no Technology is selected, as a first step you must select a particular Technology you will be working with. To do this, click on *Select Technology* tab, select a Technology from drop-down list and click on *Change* button. Technology can be changed at later stage using *Select Technology* tab. Note that when Technology is changed all settings made for this Technology during the current session (such that configurations of Studies/Experiment/Assays pages or filter settings) are lost.

Creating/viewing/editing/deleting Experiments

- To add a new Experiment to database click on *New Experiment* tab. If you are viewing Experiments attributed to one particular Experiment then new Experiment will be defined for that group. Otherwise the new Experiment will be created together with a new Experiment.
- To edit data about a Experiment click on the corresponding *edit* icon . If you have limited access rights one of the following icons will be shown instead:  (the Edit dialog is available in *view only* mode, you can also view data and supplementary files for the particular Experiment),  (the Edit dialog is available in *view only* mode, you cannot access data and supplementary files),  (you don't have access to Experiment).
- To create a new Experiment with the parameters copied from the existing one click on the corresponding *clone* icon . If you don't have access rights to a particular Experiment, the icon will be replaced by .
- To delete entry about a particular Experiment click on the corresponding *edit* icon  and then press *Delete* button. If there are Assays attributed to the given Experiment the button will be replaced with ** Delete*. This allows deleting of Experiment and **all** Assays belonging to it. Since this is a potentially dangerous operation, you will need to reconfirm the intention to delete as well as to provide the exact number of Assays belonging to this Experiment.
- To change simultaneously the values of some properties for several Experiments click on *Batch edit* tab. You will have the option to select Experiments for editing and then, after pressing *Edit Selected* button, will be directed to edit dialog which allows to change properties of selected Experiments.

Add/Edit/View Experiment dialog allows you correspondingly to enter data about a new Experiment or to edit/view (depending of your access rights) data for already existing Experiment.

The values of *Experiment Ids* are generated automatically, these values depend from Technology and user who is creating Experiment. Ids of Experiments are unique.

Data files and *Supplementary files* allows you to link to Experiment and upload data files obtained from experiments as well as supplementary information files. Depending from AIMS configuration you have the option of just uploading files from your local computer, or choice between uploading files from your local computer or selection of files already pre-uploaded via FTP. Depending from technology configuration you also may have the option to associate *file type* with each of the files, however currently this is treated just as informal comment. It is possible to link several Data or Supplementary files with each Experiment, however you

need to press *Update* button after linking each of the files and re-open Edit dialog for linking another one.

Technically there is no difference between treatment of *Data files* and *Supplementary files*, however it is recommended that *Data files* are used for files obtained from experiments and *Supplementary files* for providing additional information which can't be entered via Edit dialog fields.

The meaning of other fields hopefully should be self-apparent. The datatypes for each of the fields are shown on the right side (position mouse over datatype names for some additional information).

In *Batch edit* mode there is a checkbox for each of Experiments' fields. Check the boxes for fields values of which you wish to change. Fields are displayed in white, if its values for all Experiments selected for batch editing is the same, and gray if there are different values. *Name* fields cannot be changed in *Batch edit* mode.

Navigation

To navigate to **List of Assays** page showing Assays of a particular Experiment click on  icon.

Batch uploading

It is possible to upload Experiments from tab delimited file. To do this click on *Upload Experiments* tab. You will be directed to a special **Upload Experiments** dialog which instead of fields for Experiment properties allows you to upload tab-delimited file containing several Experiments. In addition, you have options to specify either local or already pre-uploaded (via FTP) zip file containing data and supplementary files referenced in uploaded Experiments (instead of zip files, it is also possible to reference via FTP pre-uploaded directories). After pressing *Upload* button the provided tab delimited file (as well as zip file or referenced directory) will be processed and a page listing Experiments will be shown. If there are no errors, you will have the option to complete the upload and save Experiments in database. If you upload Experiments without specifying Experiment a new Experiment will be created and **Upload Experiments** page will also contain fields to enter Experiment properties. You can download header for tab-delimited Experiment file for specific Technology by clicking on *Download ... header* link.

If data/supplementary files are pre-uploaded via FTP, there will be some delay before Experiments will be available for editing (⌚ will be shown instead of edit icon). (Edit dialogs still will be available for users with administrator rights, although note that data files still will not be copied into repository and changing file references are likely to cause errors.) If icon ⚠ is shown, this means that there have been some problems with copying data and supplementary files.

Creating reports

This is the simplest way of data export, providing export of Experiments in WYSIWYG mode. By clicking on *Report* button you are able to save the data shown on Experiments page in tab-delimited format. Columns included in report are the same which are currently configured as visible in Experiments page. Included in report are all data confirming to current filter settings, even if the number of rows shown in current page is limited.

Configurable data export

This functionality allows configurable data export in XML and tab-delimited formats. Data are exported in separate units (these could be either XML blocks or sets of rows in tab-delimited file), each unit corresponds to an Experiment and may include Experiment metadata, metadata of all Assays that belongs to the particular Experiment, and (if AIMS is linked with

an instance of SIMS) metadata of referenced Aliquots, Samples and Persons.

The export configuration is based on XML templates.

To use this type of data export click on *Batch edit* tab, select Experiments you wish to export and click on *Export XML* tab. Then select the appropriate XML template (there is an option to select from existing XML templates or upload your own), export format: XML or tab-delimited (TSV) and click on *Export* button.

XML configuration files are Technology specific and you should take care of using an appropriate one. Also, it should be noted that (depending from configuration file) data export could be a time consuming operation.

This functionality is available only for Users for whom it is explicitly enabled, this applies also to Users with Administrator rights.

Associating Experiments with Studies

This functionality is available if Studies are configured for the given Technology and Experiments associated with a particular Study are currently listed.

To change which Experiments are included in a given Study click on *Define Study* tab. All Experiments will be listed with a checkbox on a right side (checked for Experiments belonging to the given Study). You can freely modify the values of checkboxes and either click on *OK Define Study* (the Experiments associated with this Study will be redefined) or on link *Cancel Define Study* (the previous set of Experiments for this Study will be kept).

Data filtering

To filter the data about Experiments and/or Assays that are being shown click on *Filter* tab. Filtering options are described in more details in *Filter settings help page*. To clear filter settings click on *Cancel filter* tab.

Selecting visible columns

To select columns that are shown on this page as well as column order click on *Columns* button. Configuration is described in more details in *Define tabular views help page*.

Changing user settings

Settings tab generally is not specific for **List of Experiments** page. It allows changing a number of settings for the current user, such as number of entries shown in **List of Studies/Experiments/Assays** pages, user password etc. These options are described in more details in *User settings help page*.

Second level (Assays)

List of Assays page allows to view/edit/delete data either for all Assays currently in database, which are attributed to particular Technology, or Assays attributed to particular Experiment. If your access rights doesn't allow to access a particular Assay even in *view only* mode, only the value of Assay ID will be shown, all other values will be replaced by **.

Selection of Technology

If no Technology is selected, as a first step you must select a particular Technology you will be working with. To do this, click on *Select Technology* tab, select a Technology from drop-down list and click on *Change* button. Technology can be changed at later stage using the same *Select Technology* tab. Note that when Technology is changed all settings made for this Technology during the current session (such that configurations of Study/Experiment/Assay pages or filter settings) are lost.

Creating/viewing/editing/deleting Assays

- To add a new Assay to database click on *New Assay* tab. If you are viewing Assays attributed to one particular Experiment then new Assay will be defined for that group. Otherwise the new Assay will be created together with a new Experiment.

- To edit data about a Assay click on the corresponding *edit* icon . If you have limited access rights one of the following icons will be shown instead:  (the Edit dialog is available in *view only* mode, you can also view data and supplementary files for the particular Assay),  (the Edit dialog is available in *view only* mode, you cannot access data and supplementary files),  (you don't have access to Assay).

- To create a new Assay with the parameters copied from the existing one click on the corresponding *clone* icon . If you don't have access rights to a particular Assay, the icon will be replaced by .

- To delete entry about a particular Assay click on the corresponding *edit* icon  and then press *Delete* button.

- To change simultaneously the values of some properties for several Assays click on *Batch edit* tab. You will have the option to select Assays for editing and then, after pressing *Edit Selected* button, will be directed to edit dialog which allows to change properties of selected Assays.

Add/Edit/View Assay dialog allows you correspondingly to enter data about a new Assay or to edit/view (depending of your access rights) data for already existing Assay.

The values of *Assay Ids* are generated automatically, these values depend from Technology, Experiment and user who is creating Assay. Ids of Assays attributed to a particular Experiment will be unique.

The *Aliquot* field should either be filled by using the prompting button (if available) and selecting the referenced Aliquot from the list (in case when multiple Aliquots will be selected, several Assays, one for each Aliquot, will be created); or can be filled with arbitrary string value (including empty) if prompting button is unavailable. The requirement of Aliquot prompting depends from AIMS configuration.

Data files and *Supplementary files* allows you to link to Assay and upload data files obtained from experiments as well as supplementary information files. Depending from AIMS configuration you have the option of just uploading files from your local computer, or choice between uploading files from your local computer or selection of files already pre-uploaded via FTP. Depending from technology configuration you also may have the option to associate *file*

type with each of the files, however currently this is treated just as informal comment. It is possible to link several Data or Supplementary files with each Assay, however you need to press *Update* button after linking each of the files and re-open Edit dialog for linking another one.

Technically there is no difference between treatment of *Data files* and *Supplementary files*, however it is recommended that *Data files* are used for files obtained from experiments and *Supplementary files* for providing additional information which can't be entered via Edit dialog fields.

The meaning of other fields hopefully should be self-apparent. The datatypes for each of the fields are shown on the right side (position mouse over datatype names for some additional information).

In *Batch edit* mode there is a checkbox for each of Assays' fields. Check the boxes for fields values of which you wish to change. Fields are displayed in white, if its values for all Assays selected for batch editing is the same, and gray if there are different values. *Name* and *Aliquot* fields cannot be changed in *Batch edit* mode.

Batch uploading

It is possible to upload Assays from tab delimited file. To do this click on *Upload Assays* tab. You will be directed to a special **Upload Assays** dialog which instead of fields for Assay properties allows you to upload tab-delimited file containing several Assays. In addition, you have options to specify either local or already pre-uploaded (via FTP) zip file containing data and supplementary files referenced in uploaded Assays (instead of zip files, it is also possible to reference via FTP pre-uploaded directories). After pressing *Upload* button the provided tab delimited file (as well as zip file or referenced directory) will be processed and a page listing Assays will be shown. If there are no errors, you will have the option to complete the upload and save Assays in database.

If you upload Assays without specifying Experiment a new Experiment will be created and **Upload Assays** page will also contain fields to enter Experiment properties.

You can download header for tab-delimited Assay file for specific Technology by clicking on *Download ... header* link.

If data/supplementary files are pre-uploaded via FTP, there will be some delay before Assays will be available for editing (⌚ will be shown instead of edit icon). (Edit dialogs still will be available for users with administrator rights, although note that data files still will not be copied into repository and changing file references are likely to cause errors.) If icon ⚠ is shown, this means that there have been some problems with copying data and supplementary files.

Creating reports

This is the simplest way of data export, providing export of Assays in WYSIWYG mode. By clicking on *Report* button you are able to save the data shown on Assays page in tab-delimited format. Columns included in report are the same which are currently configured as visible in Assays page. Included in report are all data confirming to current filter settings, even if the number of rows shown in current page is limited.

Data filtering

To filter the data about Experiments and/or Assays that are being shown click on *Filter* tab. Filtering options are described in more details in *Filter settings help page*. To clear filter settings click on *Cancel filter* tab.

Selecting visible columns

To select columns that are shown on this page as well as column order click on *Columns* button. Configuration is described in more details in *Define tabular views help page*.

Changing user settings

Settings tab generally is not specific for **List of Assays** page. It allows changing a number of settings for the current user, such as number of entries shown in **List of Studies/Experiments/Assays** pages, user password etc. These options are described in more details in *User settings help page*.

”View” level (Studies)

List of Studies page allows to view/edit/delete data either for all Studies currently in database, which are attributed to particular Technology. This page is available only if Studies are configured for the given Technology. If your access rights doesn't allow to access a particular Study even in *view only* mode, only the value of Study ID will be shown, all other values will be replaced by **.

There is an important difference between *Studies* and *Experiments/Assays* levels. Whilst there is a hierarchical *one-to-many* relation between *Experiments* and *Assays* - each *Assay* belongs to exactly one *Experiment* and will be deleted, if that *Experiment* will be deleted, there are possible *many-to-many* relations between *Studies* and *Experiments* and *Experiments* are not affected by creation or deletion of Studies. The association between *Studies* and *Experiments* are defined from **List of Studies** page. For more information see *First level (Experiments) help page*.

Selection of Technology

Generally **List of Studies** is available only if a technology is already selected. Technology can be changed at later stage using the same *Select Technology* tab, selecting a Technology from drop-down list and clicking on *Change* button. Note that when Technology is changed all settings made for this Technology during the current session (such that configurations of Studies/Experiments/Assays pages or filter settings) are lost.

Creating/viewing/editing/deleting Studies

- To add a new Study to database click on *New Study* tab.
- To edit data about a Study click on the corresponding *edit* icon . If you have limited access rights one of the following icons will be shown instead:  (the Edit dialog is available in *view only* mode, you can also view data and supplementary files for the particular Study),  (the Edit dialog is available in *view only* mode, you cannot access data and supplementary files),  (you don't have access to Study).
- To create a new Study with the parameters copied from the existing one click on the corresponding *clone* icon . If you don't have access rights to a particular Study, the icon will be replaced by .
- To delete entry about a particular Study click on the corresponding *edit* icon  and then press *Delete* button. If there are Assays attributed to the given Study the button will be replaced with ** Delete*. This allows deleting of Study and **all** Assays belonging to it. Since this is a potentially dangerous operation, you will need to reconfirm the intention to delete as well as to provide the exact number of Assays belonging to this Study.

Add/Edit/View Study dialog allows you correspondingly to enter data about a new Study or to edit/view (depending of your access rights) data for already existing Study.

The values of *Study Ids* are generated automatically, these values depend from Technology and user who is creating Study. Ids of Studies are unique.

Data files and *Supplementary files* allows you to link to Study and upload data files obtained from Studies as well as supplementary information files. Depending from AIMS configuration you have the option of just uploading files from your local computer, or choice between uploading files from your local computer or selection of files already pre-uploaded via FTP. Depending from technology configuration you also may have the option to associate *file type* with each of the files, however currently this is treated just as informal comment.

It is possible to link several Data or Supplementary files with each Study, however you need to press *Update* button after linking each of the files and re-open Edit dialog for linking

another one.

Technically there is no difference between treatment of *Data files* and *Supplementary files*, however it is recommended that *Data files* are used for files obtained from Studies and *Supplementary files* for providing additional information which can't be entered via Edit dialog fields.

The meaning of other fields hopefully should be self-apparent. The datatypes for each of the fields are shown on the right side (position mouse over datatype names for some additional information).

Navigation

To navigate to **List of Experiments** page showing Experiments associated with a particular Study click on  icon.

Creating reports

This is the simplest way of data export, providing export of Studies in WYSIWYG mode. By clicking on *Report* button you are able to save the data shown on Studies page in tab-delimited format. Columns included in report are the same which are currently configured as visible in Studies page. Included in report are all data conforming to current filter settings, even if the number of rows shown in current page is limited.

Data filtering

Currently is not available for **List of Studies** page.

Selecting visible columns

To select columns that are shown on this page as well as column order click on *Columns* button. Configuration is described in more details in *Define tabular views help page*.

Changing user settings

Settings tab generally is not specific for **List of Studies** page. It allows changing a number of settings for the current user, such as number of entries shown in **List of Studies/Experiments/Assays** pages, user password etc. These options are described in more details in *User settings help page*.

Data filtering

Filter settings page allows to search for Study Groups/Assays with a values of selected fields equal to the values defined in search page filters.

The fields, which are available for filtering, are defined in **parameters** and **common_parameters** tables. To define a filter for a particular field, enter a filtering expression for this field. The syntax of filtering expressions are as follows:

- symbol "%" matches any substring (including empty substrings),
- symbol "_" matches any single symbol,
- all other symbols matches themselves.

The filtering is done by SQL queries and for some particular datatypes (boolean, lists of numbers, etc.) the syntax of "right" filtering expressions may not be intuitive. For fields of fixed vocabulary types a drop-down list is provided instead of filtering expression.

Filters are conjunctive, i.e. if a field is included in search, database entries satisfying filter values for this field **AND** filter values for all other fields will be found.

To display all database entries press *Cancel filter* button either on Study Groups or on Assays page.

Defining tabular views and reports

Define ... view page allows to select which columns and in which order will be displayed in "View" (Studies), First (Experiments) or Second (Assays) level pages in list (tabular) format. It also defines which fields will be exported by **Report** function (which actually might be the main reason for changing these settings). The level for which column display options can be changed corresponds to the level from which **Define ... view** page has been entered (by using **Columns** function).

To change the settings, enter numbers of columns in which the fields of interest should be displayed. Columns are numbered by rational positive numbers which should be entered in two adjacent textboxes containing correspondingly integer and fractional parts. On view pages columns will be shown from left to right according to increasing ordering of column numbers. Column number 0 means that the corresponding field will not be displayed.

To apply view settings press *Ok* button. Pressing of *Tune* button will "normalize" the column numbering, i.e. columns will be assigned consecutive integer numbers starting from 1. Also, they will be re-ordered according to their numbers. Normalizing and re-ordering occurs also on re-entering **Define ... view** page.

Settings are preserved only within the current session. After the next login the default settings will be restored (the later can be configured from **Configuration tables** page by users having sufficient access rights to do so).

Vocabulary tables

Vocabulary tables page allows to view/add/edit/delete entries in fixed vocabularies.

Vocabularies that are available for editing depends from currently selected technology. Shown are vocabularies that are defined for the particular technology (this is done in **Configuration tables** page) as well as *common* vocabularies that are available for all technologies (these are defined separately in **Administrator tables** page).

Editing options include adding new entries to the vocabulary, deleting existing entries, renaming existing entries and changing the order in which entries will be available for selection. To add a new entry click on a *new* link for a specific vocabulary. To edit/delete entry click on *edit* icon  for a specific vocabulary. To change the display order use correspondingly  and  icons.

Editing of vocabularies should be done with some care - deleting of an existing entry and subsequent adding of new entry with the same name may lead to wrong values being associated with data that are already stored in the system. However changing the order in which entries are displayed for selection is safe operation in such context and doesn't affect the data already stored in the system.

The length of vocabulary tables is limited by a 4000 character long encoding of vocabulary in database.

Depending from your access rights you might have only *view only* access to **Vocabulary tables** page or the page might be unavailable for you.

User settings

User settings page allows the user change settings of several values associated with this user. The changes are permanent and will be preserved after the termination of the current session. There are some values (e.g. *Page size*) of user settings that can be configured only by a particular user on this page and some values (e.g. *Passowrd*) that can be changed also by System Administrator in **Administrator tables** page.

Currently the settings of the following values can be changed by the user:

- *Page size of lists*. Number of data entries that will be shown in one page in list format. The default initial setting is 1000; a user might consider setting a lower value if using a low-speed internet connection.
- *Show full ids*. Entry Ids are being generated automatically and usually are in the form "[prefix]-[number]". This setting determines whether the number part of Id will be shown with or without leading zeroes (in current version when zeroes are shown numbers are expanded up to 6 digits).
- *Default group*. The user can change his default group, selecting it from a list of groups he is a member (the membership to groups is assigned by System Administrator in **Administrator tables** page). The value of default group determines the group ownership that will be assigned to new "View" level (Studies) or First level (Experiments) entries created by this user. Changing this value doesn't affect group ownership of existing entries that have been created by this user.
- *Change password*. Allows the user to change his passowrd.

Technology configuration

Configuration tables page allows to access and (depending from your access rights) modify configuration of currently selected technology. The tables shown on this page and their meaning are described below.

Table *Parameter types*

Contains data types that are available for the current Technology for use in configurable parameter fields. There are 10 base types, some of which may be parameterized by different values of 2 attributes (currently, only Attribute 1 values is used practice). In database all these datatypes are encoded in 200 byte character strings, which places some restrictions on range of values that can be used in these data types. The available base types are:

- **string** string of up to 200 characters, shown in one line in edit dialogs,
- **bigstring** string of up to 200 characters, shown in multiple lines in edit dialogs,
- **number** integer (range likely depends from what is recognized as integers by java),
- **float** float (range likely depends from what is recognized as floats by java),
- **boolean** yes/no, represented by checkbox in edit pages,
- **array of number** list of 1 to 10 integers, shown adjacently in one row in edit pages, number of integers given as value for Attribute 1,
- **array of float** list of 1 to 10 floats, shown adjacently in one row in edit pages, of integers given as value for Attribute 1,
- **table**, values from controlled vocabulary defined in **Vocabularies** or **Common Vocabularies** tables (the last can be found on **Administrator tables** page), the required table should be selected in field *Table name*. Values from vocabularies are shown in edit dialogs as drop-down lists.
- **datetime** data and time (if Attribute 1 value is 3), date (if Attribute 1 value is 2) or year (if Attribute 1 value is 1).
- **time** time (duration) in format mm:ss if Attribute 1 value is 3), hh:mm (if Attribute 1 value is 6) or hh:mm:ss (if Attribute 1 value is 7)

The table automatically lists all entries present in **Common parameter types** table (shown on **Administrator tables** page), which are uneditable. In addition new entries can be created and/or edited for a particular technology. Generally this is needed for creation of new parameters of **table** and **array of...** types. The meaning of the table fields should be apparent.

Table *Common parameters*

Table contains configuration of fixed datatype fields for current Technology for Studies, Experiments and Assays. For each of these the following fixed type fields are available - *indentifString* (normally used for Ids, string of up to 200 characters), *visibleName* (normally used for Names, string of up to 200 characters), *comment* (string of up to 4000 characters), *dataFiles* (used for associated data files), *protocolFiles* (used for supplementary files), *creator* (FK to **Users** table), *modifier* (FK to **Users** table), *createDate* (datetime), *modifDate* (datetime) and *aliquotId* (string of up to 200 characters and (optionally) FK to referenced Aliquot).

Configuration options include visibility and column and row names in edit dialogs. Note that (apart from aliquotID, which should be used only for Assays) there is exactly one field of each type available for Studies, Experiments and Assays. The configuration of fields *creator*, *modifier*, *createDate* and *modifDate* is optional.

The table contains the following configurable fields (in this order):

- *Parameter short name* - name shown as column name in **List of Studies/Experiments/Assays** pages,
- *Parameter long name* - name shown on the left side of the field in Add/Edit/View dialogs,
- *Parameter upload name* - name used in header of batch upload file,

- *Assay column name* - the name of field which is configured (doesn't apply to Assays, if left empty),
- *Experiment column name* - the name of field which is configured (doesn't apply to Experiments, if left empty),
- *Study column name* - the name of field which is configured (doesn't apply to Studies, if left empty),
- *Assay view column #* - column number in **List of Assays** page (not shown, if 0),
- *Sortable* - if *true*, the entries in **List of Assays** can be sorted by the values of this parameter,
- *Experiment view column #* - column number in **List of Experiments** page (not shown, if 0),
- *Sortable* - if *true*, the entries in **List of Experiments** can be sorted by the values of this parameter
- *Study view column #* - column number in **List of Studies** page (not shown, if 0),
- *Sortable* - if *true*, the entries in **List of Studies** can be sorted by the values of this parameter,
- *Show in filter* - if *true* the parameter will be included in data filter,
- *Comment* - informal comment.

Table Parameters

Table contains configuration of *Fxxx* fields for current Technology for Studies, Experiments and Assays. Currently up to 55 fields from *F001* to *F055* are available for Studies, Experiments and Assays. (to increase this, changes should be made in both, data base and program files). Apart from configuration options what is available for **Common parameters**, additionally "soft" data types used for these fields should be configured (available datatypes are these that are given in **Parameter types** table).

The table contains the following configurable fields (in this order):

- *Parameter short name* - name shown as column name in **List of Studies/Experiments/Assays** pages,
- *Parameter group* - parameter group (see **Parameter groups** table in **Administrator tables** page) to which the parameter belongs. Parameter groups affect the upper level header in **List of Studies/Experiments/Assays** pages and parameter position in Add/Edit/View dialogs (all parameters from the same group are kept together),
- *Parameter type* - parameter type from **Parameter types** table,
- *Parameter long name* - name shown on the left side of the field in Add/Edit/View dialogs,
- *Parameter upload name* - name used in header of batch upload file,
- *Assay column name* - the name of field which is configured (doesn't apply to Assays, if left empty),
- *Experiment column name* - the name of field which is configured (doesn't apply to Experiments, if left empty),
- *Study column name* - the name of field which is configured (doesn't apply to Studies, if left empty),
- *Required* - if *true* the field can't be left empty,
- *Assay view column #* - column number in **List of Assays** page (not shown, if 0),
- *Sortable* - if *true*, the entries in **List of Assays** can be sorted by the values of this parameter,
- *Experiment view column #* - column number in **List of Experiments** page (not shown, if 0),
- *Sortable* - if *true*, the entries in **List of Experiments** can be sorted by the values of this parameter,
- *Study view column #* - column number in **List of Studies** page (not shown, if 0),
- *Sortable* - if *true*, the entries in **List of Studies** can be sorted by the values of this parameter,
- *Assay row* - order number of the field in Add/Edit/View dialog for Assays (within a parameter group),
- *Experiment row* - order number of the field in Add/Edit/View dialog for Experiments (within a parameter group),
- *Study row* - order number of the field in Add/Edit/View dialog for Studies (within a parameter group),

- *Show in filter* - if *true* the parameter will be included in data filter,
- *Comment* - informal comment.

Table *Data types*

Data types are labels for different types of data files that for current Technology can be associated with Studies, Experiments and Assays. They are optional and for informal use only - processing of data file doesn't depend from data type used for labelling it.

Table *Supplementary types*

Supplementary types are labels for different types of supplementary files that for current Technology can be associated with Studies, Experiments and Assays. They are optional and for informal use only - processing of supplementary file doesn't depend from supplementary type used for labelling it.

Table *Vocabularies*

Defines controlled vocabularies available for current Technology. The content of these controlled vocabularies is accessible and can be modified from **Vocabularies** page. To use these vocabularies, the corresponding parameter **table** types should be additionally configured also in **Parameter types** table. The dialog for entries contains fields *Table* (the name to be referenced in **Parameter types** table) and *Long name* (the name under which vocabulary is shown in **Vocabularies** page) as well as informal *Comment*.

System administration

Administrative tables page allows to access and (depending from your access rights) modify technology independent configuration tables of the system. Generally these tables can be divided in two groups: user and their access rights management and settings that apply to all technologies. The tables shown on this page and their meaning are described below.

Table *Technologies*

Contains data about currently configured Technologies and allows creating of new Technologies and modifying the existing ones. There is also an option of Technology import in XML format (when doing the Technology name given in import file will be used unless it is already present, in later case it will be modified to made it unique) as well as for Technology configuration export in XML format. The import/export XML files generally contain information about the particular entry in **Technologies** table as well as full contents of tables in **Vocabularies** and **Configuration** pages for the particular Technology. Due to this importing of Technologies should be done with some caution - if the Technology is undesired and need to be deleted, the contents of tables in **Vocabularies** and **Configuration** pages largely will need to be deleted manually.

Also, when a new Technology is created, content of tables **Common parameter types** and **Default common parameters** are copied to configuration of new Technology. The table contains the following fields:

- *Technology* - Technology name,
- *Id prefix* - a string which will be used as part of Id when creating new Experiments or Studies,
- *FTP directory* - subdirectory from which data and supplementary files will be listed (if FTP option is enabled for this AIMS configuration),
- *Is public* - if *true*, Technology is visible for all users, otherwise only for users configured in **Technology access rights** table.
- *Show Studies* - if *true*, Studies level is available for this Technology,
- *Comment* - informal comment.

Table *Parameter groups*

Describes Parameter groups which are control the upper level header in **List of Studies/Experiments/Assays** pages and parameter position in Add/Edit/View dialogs (all parameters from the same group are kept together). Also largely informal, up to extent the use of default groups provided with AIMS is recommended.

The table contains the following fields:

- *Parameter group* - Parameter group name, used in defining Parameter group in **Parameters** table for particular technology,
- *Short name* - name shown in upper level header in **List of Studies/Experiments/Assays** pages,
- *Position in Assay* - the order number of fields of this Parameter group in Add/Edit/View dialog for Assays,
- *Position in Experiment* - the order number of fields of this Parameter group in Add/Edit/View dialog for Experiments,
- *Position in Study* - the order number of fields of this Parameter group in Add/Edit/View dialog for Studies,
- *Comment* - informal comment.

Table *Common parameter types*

Contains data types that are available for the all Technologies for use in configurable parameter fields. There are 10 base types, some of which may be parameterized by different

values of 2 attributes (currently, only Attribute 1 values is used practice). In database all these datatypes are encoded in 200 byte character strings, which places some restrictions on range of values that can be used in these data types. The available base types are:

- **string** string of up to 200 characters, shown in one line in edit dialogs,
- **bigstring** string of up to 200 characters, shown in multiple lines in edit dialogs,
- **number** integer (range likely depends from what is recognized as integers by java),
- **float** float (range likely depends from what is recognized as floats by java),
- **boolean** yes/no, represented by checkbox in edit pages,
- **array of number** list of 1 to 10 integers, shown adjacently in one row in edit pages, number of integers given as value for Attribute 1,
- **array of float** list of 1 to 10 floats, shown adjacently in one row in edit pages, of integers given as value for Attribute 1,
- **table**, values from controlled vocabulary defined in **Vocabularies** or **Common Vocabularies** tables (the last can be found on **Administrator tables** page), the required table should be selected in field *Table name*. Values from vocabularies are shown in edit dialogs as drop-down lists.
- **datetime** data and time (if Attribute 1 value is 3), date (if Attribute 1 value is 2) or year (if Attribute 1 value is 1).
- **time** time (duration) in format mm:ss if Attribute 1 value is 3), hh:mm (if Attribute 1 value is 6) or hh:mm:ss (if Attribute 1 value is 7)

The meaning of the table fields should be apparent. The table entries are automatically included in **Parameter types** table in **Configuration** page for all Technologies.

Table Default common parameters

Table is used as a template for **Common Parameters** table in **Configuration** page when a new Technology is created.

Table contains configuration of fixed datatype fields for current Technology for Studies, Experiments and Assays. For each of these the following fixed type fields are available - *identifString* (normally used for Ids, string of up to 200 characters), *visibleName* (normally used for Names, string of up to 200 characters), *comment* (string of up to 4000 characters), *dataFiles* (used for associated data files), *protocolFiles* (used for supplementary files), *creator* (FK to **Users** table), *modifier* (FK to **Users** table), *createDate* (datetime), *modifDate* (datetime) and *aliquotId* (string of up to 200 characters and (optionally) FK to referenced Aliquot).

Configuration options include visibility and column and row names in edit dialogs. Note that (apart from aliquotID, which should be used only for Assays) there is exactly one field of each type available for Studies, Experiments and Assays. The configuration of fields *creator*, *modifier*, *createDate* and *modifDate* is optional.

The table contains the following configurable fields (in this order):

- *Parameter short name* - name shown as column name in **List of Studies/Experiments/Assays** pages,
- *Parameter long name* - name shown on the left side of the field in Add/Edit/View dialogs,
- *Parameter upload name* - name used in header of batch upload file,
- *Assay column name* - the name of field which is configured (doesn't apply to Assays, if left empty),
- *Experiment column name* - the name of field which is configured (doesn't apply to Experiments, if left empty),
- *Study column name* - the name of field which is configured (doesn't apply to Studies, if left empty),
- *Assay view column #* - column number in **List of Assays** page (not shown, if 0),
- *Sortable* - if *true*, the entries in **List of Assays** can be sorted by the values of this parameter,
- *Experiment view column #* - column number in **List of Experiments** page (not shown, if 0),
- *Sortable* - if *true*, the entries in **List of Experiments** can be sorted by the values of this parameter

- *Study view column #* - column number in **List of Studies** page (not shown, if 0),
- *Sortable* - if *true*, the entries in **List of Studies** can be sorted by the values of this parameter,
- *Show in filter* - if *true* the parameter will be included in data filter,
- *Comment* - informal comment.

Table *Common vocabularies*

Defines controlled vocabularies available for all Technologies. The content of these controlled vocabularies is accessible and can be modified from **Vocabularies** page. To use these vocabularies, the corresponding parameter **table** types should be additionally configured also in **Parameter types** table for each Technology where it is used. The dialog for entries contains fields *Table* (the name to be referenced in **Parameter types** table) and *Long name* (the name under which vocabulary is shown in **Vocabularies** page) as well as informal *Comment*.

Table *Users*

Defines Users of the system.
The table contains the following fields:

- *User description* - informal User description,
- *Login name* - login name,
- *Administrator rights* - administrator level rights for this user, the options are *non-accessible* (no access to **AdminTables** page), *view only*, *limited editing* (actually meaning almost full access, some configuration printouts and **Pending tasks** table not shown) and *full editing*,
- *User password* - password (shown in MD5 hashed form, but can be reset from this dialog),
- *Id prefix* - a string which will be used as part of Id when creating new Experiments or Studies,
- *Export is allowed* - if *true*, the User can export data in XML or tab-delimited form based on XML configuration templates,
- *FTP is allowed* - if *true*, User can access files preuploaded via FTP (if FTP option is enabled for this AIMS configuration),
- *FTP directory* - subdirectory from which data and supplementary files will be listed (if FTP option is enabled for this AIMS configuration),
- *Default user group* - the User group, which owns Studies and Experiments created by this user. When a new user is created all User groups is available in drop-down list and initially default User group is selected. When data about already existing user is edited this list contains only User groups the User is member of,
- *Comment* - informal comment.

At least one User group must be present (and one User is created automatically when newly installed AIMS is used for the first time). Users having *Administrator rights* at *limited editing* or higher level automatically have full access to all entries and **Vocabularies** and **Configuration** pages regardless of access rights configurations.

Table *User rights*

Defines granting of access rights at user level.
The table contains the following fields:

- *Granted by* - User to Studies and Experiments owned by whom the access is granted,
- *Granted to* - User to which the access is granted,
- *User rights* - the level of rights granted, options are *non-accessible*, *view only*, *data files non-accessible*, *view only*, *data files accessible* and *full access*,
- *Comment* - informal comment.

Generally User has full access to entries owned by him, access to other entries depend from

configuration in **User rights** and **User group rights** tables. User doesn't automatically have access to entries of user group he belongs to - this has to be configured in **User group rights** table.

Table Technology access rights

Defines users that can access non-public Technologies.
The table contains the following fields:

- *User* - User to which access is given,
- *Technology* - Technology for which access is given,
- *Can create Experiment* - if *true*, can create new Experiments and Studies (if configured for particular Technology),
- *Vocabulary access rights* - the access level to **Vocabularies** page, options are *non-accessible*, *view only*, *limited editing* (can edit existing entries but not delete them or create new ones) and *full editing*,
- *Configuration access rights* - the access level to **Configuration** page, options are *non-accessible*, *view only*, *limited editing* (can edit existing entries but not delete them or create new ones) and *full editing*,
- *Comment* - informal comment.

Table User groups

Defines User groups.
The table contains the following fields:

- *Group name* - name of User group,
- *Is default* - if *true* this is the User group the newly created user is assigned to as to his default User group,
- *Comment* - informal comment.

At least one User group must be present (and one User group is created automatically when newly installed AIMS is used for the first time). Exactly one User group should be *default* - to facilitate this *Is default* checkbox can only be checked, not un-checked (when another User group is made default, the previous default User group loses that status).

Table User group rights

Defines granting of access rights at user group level.
The table contains the following fields:

- *Granted by* - User group to Studies and Experiments owned by whom the access is granted,
- *Granted to* - User group to which the access is granted,
- *User rights* - the level of rights granted, options are *non-accessible*, *view only*, *data files non-accessible*, *view only*, *data files accessible* and *full access*,
- *Comment* - informal comment.

Generally User has full access to entries owned by him, access to other entries depend from configuration in **User rights** and **User group rights** tables. User doesn't automatically have access to entries of user group he belongs to - this has to be configured in **User group rights** table.

Table User group membership

Describes User groups to which User is a member.
The table contains the following fields:

- *User* - User for which membership is defined,
- *User group* - User group to which user belongs,

- *Comment* - informal comment.

When a new user is created, he is automatically assigned to default User group and the corresponding entry is placed in this table. The user can't be deleted from his default group.

Table *Pending tasks*

Table shows information about data and protocol files associated with uploaded assays that still have to be uploaded in repository. This table generally is for providing information only - unless system errors have occurred, editing isn't recommended.