



Jihočeská univerzita  
v Českých Budějovicích  
University of South Bohemia  
in České Budějovice



Protocol manager

# BioWes

[www.biowes.org](http://www.biowes.org)

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Technology Agency  
of the Czech Republic

# Introduction



The purpose of this manual:

- Basic description of the software for local management of protocols and protocol templates
- Description of the process of protocol template designs
- Description of the process of protocol generation

Development team:

- Institute of complex systems, FFPW, University of South Bohemia in Ceske Budejovice
  - <http://www.frov.jcu.cz/en/sks-frov-ju/skola-komplexnich-systemu>
- dataPartner Ltd.
  - <http://www.datapartner.cz/>

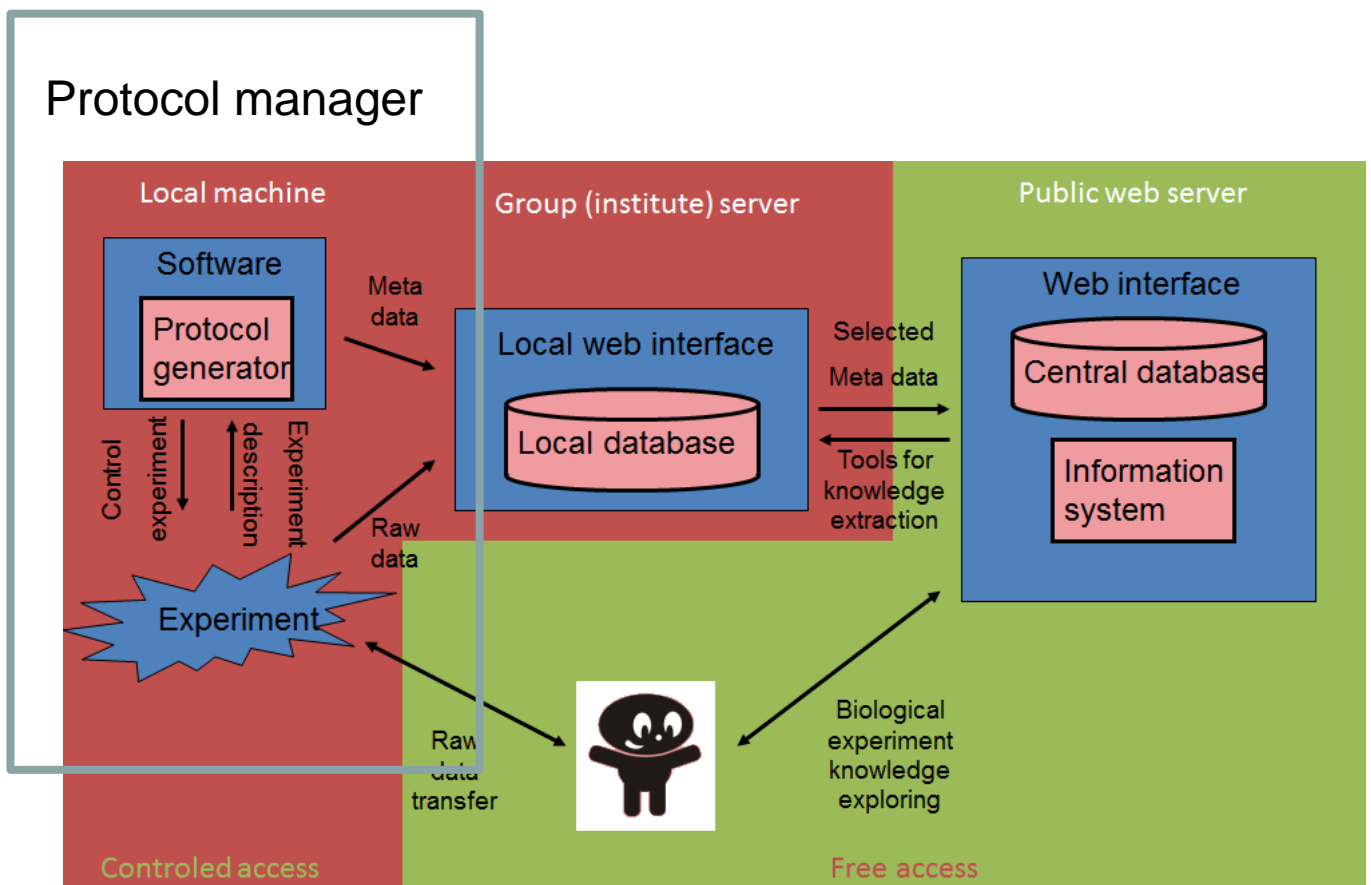
## Outline:

- Protocol manager
  - Software GUI
  - Protocol templates
  - Protocols
- How to create and edit protocol template – Protocol designer
  - Components
  - Protocol design
  - Standardization
- How to create and edit protocol from template – Protocol generator
  - Plug-ins
  - Experimental data association

# Protocol manager



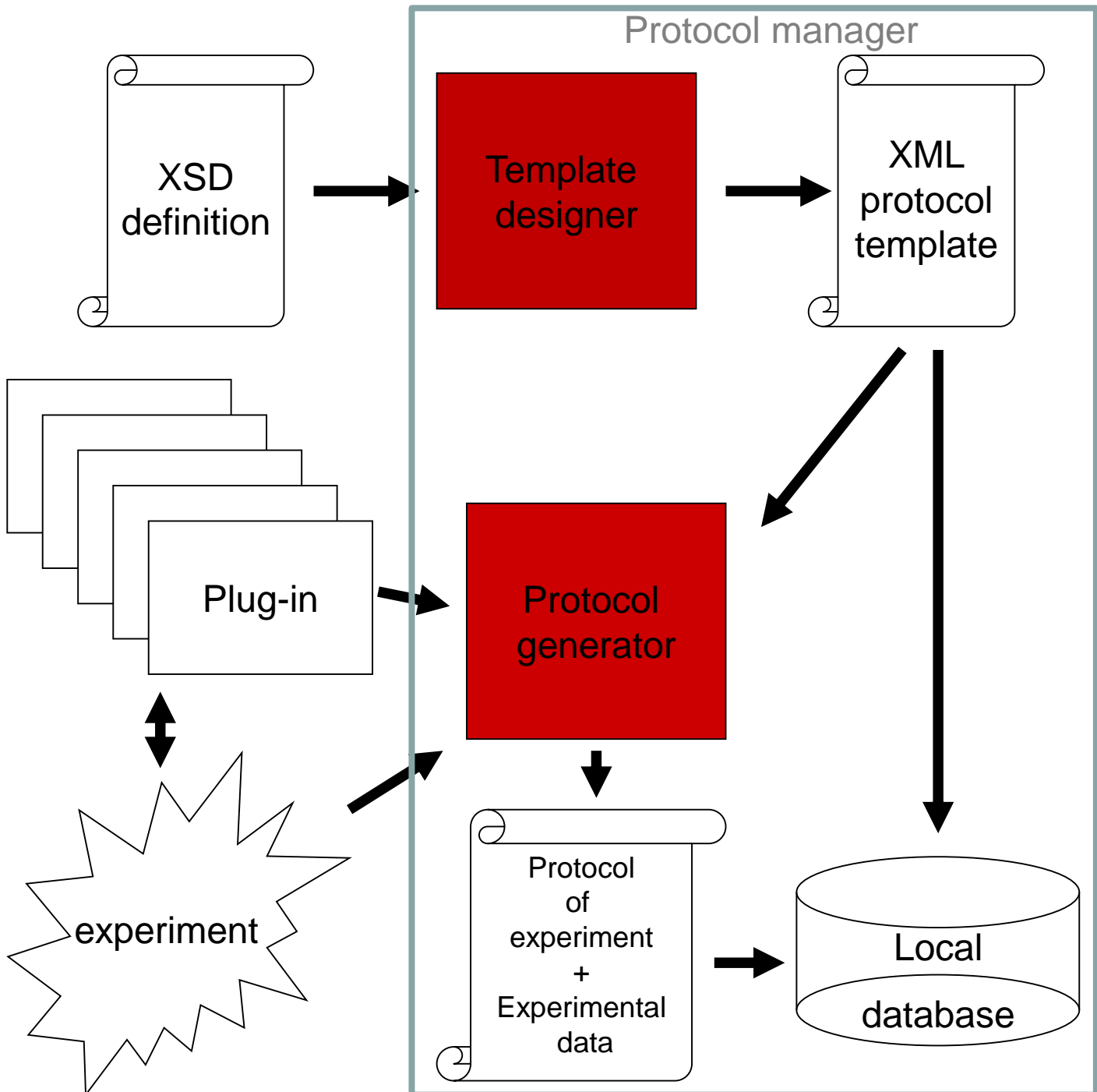
- Protocol manager is stand alone application dedicated for the design of experimental protocol templates and management of experimental protocols.
- It is a part of BioWes solution. The software is operated at local computers (computers connected to measurement devices) connected to the local server.
- Contains two basic tools
  - Protocol designer
  - Protocol generator



# Protocol manager



The role of Protocol manager in the system of experimental data management.



# Protocol manager - GUI



Log in  
Log off

Tab with  
tools

Tab with  
tool  
menu

Tool operating  
window

The screenshot shows the Protocol manager GUI. At the top, there are callout boxes pointing to various UI elements: 'Log in Log off' points to the top-left navigation area; 'Tab with tools' points to the 'Protocol Template Tools' tab; 'Tab with tool menu' points to the 'Protocol Templates' tab; and 'Tool operating window' points to the main content area. The main content area displays a table of protocols with columns for Name, Description, Author, and Last Change. The table contains 12 rows of data, including protocols like ASDSA, Bio-compatibility, Cell segmentation, and dsf. The bottom of the window shows a status bar with 'Record 49 of 126'.

	Name	Description	Author	Last Change
🌸	ASDSA		cisar@frov.jcu....	2014-01-21 10:...
✅	Bio-compatibility	Bio-compatibility using direct contact	cisar@frov.jcu....	2013-12-17 12:...
✅	Bio-compatibility...	Bio-compatibility nanoparticiles	cisar@frov.jcu....	2013-12-17 12:...
🌸	Bio-compatibility...		cisar@frov.jcu....	2014-01-22 14:...
✅	Cell segmentation	Time-lapse image processing - colony segmentation	cisar@frov.jcu....	2014-01-13 08:...
🌸	dsf		cisar@frov.jcu....	2014-06-29 20:...
🌸	fggfgg		cisar@frov.jcu....	2014-06-29 20:...
🌸	fsdfds		cisar@frov.jcu....	2014-06-29 21:...
🌸	fsdfsd		cisar@frov.jcu....	2014-06-29 20:...
🌸	ghjgjutzh		cisar@frov.jcu....	2014-01-21 15:...
🌸	gjgh		cisar@frov.jcu....	2014-01-21 15:...

# Protocol templates



- To manage protocol templates, click on Protocol templates on Home tab
- The list of user templates is listed (templates of the user or shared templates)

List of templates

	Name	Description	Author	Last Change
★	ASDSA		cisar@frov.jcu...	2014-01-21 10:...
✓	Bio-compatibility	Bio-compatibility using direct contact	cisar@frov.jcu...	2013-12-17 12:...
✓	Bio-compatibility...	Bio-compatibility namopartciles	cisar@frov.jcu...	2013-12-17 12:...
★	Bio-compatit...		cisar@frov.jcu...	2014-01-22 14:...
✓	Cell segmentation	Time-lapse image processing - colony segmentation	cisar@frov.jcu...	2014-01-13 08:...
★	dsf		cisar@frov.jcu...	2014-06-29 20:...
★	gfgg		cisar@frov.jcu...	2014-06-29 20:...
★	ls		cisar@frov.jcu...	2014-06-29 21:...
★	f		cisar@frov.jcu...	2014-06-29 20:...
★	g		cisar@frov.jcu...	2014-01-21 15:...
★			cisar@frov.jcu...	2014-01-21 15:...

Finalized template – cannot be modified

Not finalized template – can be modified

# Protocols



- To manage protocols, click on Protocols on Home tab
- The list of user protocols is listed (protocols of the user or shared templates)

List of protocols

The screenshot shows the 'Protocols' management interface. The 'Protocols' icon in the top navigation bar is circled in red. Below it, a list of protocols is displayed in a table. A callout box labeled 'List of protocols' points to the table. Two other callout boxes are present: 'Finalized template – cannot be modified' points to a row with a green checkmark icon, and 'Not finalized template – can be modified' points to a row with a yellow star icon.

	Name	Description	Author	Last Change
▶	Cytotoxicity-7.10.2014		cisar@frov.jcu.cz	2014-10-07 2...
	Cytotoxicity-1.10.2014		cisar@frov.jcu.cz	2014-10-07 1...
	Biocompatibility - TiGr2 - C...		cisar@frov.jcu.cz	2014-10-08 1...
	Biocompatibility - cell prepara...		cisar@frov.jcu.cz	2014-10-09 1...
	Biocompatibility - microsco...		cisar@frov.jcu.cz	2014-10-08 1...
	Biocompatibility - microso...	Corrected image sample	cisar@frov.jcu.cz	2014-10-08 1...
	Biocompatibility - segmenta...		cisar@frov.jcu.cz	2014-10-08 1...
	Biocompatibility - segment...		cisar@frov.jcu.cz	2014-10-08 1...
	Biocompatibility - ImplantI		cisar@frov.jcu.cz	2014-10-09 1...
	Te... color analysis		abarta@frov.jcu.cz	2014-10-08 1...

Finalized template – cannot be modified

Not finalized template – can be modified



# How to create new protocol template – template designer



1. Click on Add on Protocol templates tab
  - Protocol designer tool is executed
2. Define the name of new protocol template

The screenshot shows the 'Protocol Template Tools' interface. The 'Add' button is circled in red. A dialog box titled 'Define New Protocol Template' is open, with the 'Name' field containing 'Bio-compatibility'. The background shows a table of protocol templates.

Name	Description	Author	Last Change
ASDSA		cisar@frov.jcu...	2014-01-21 10:...
Bio		jcu...	2013-12-17 12:...
Bio		jcu...	2013-12-17 12:...
Bio		jcu...	2014-01-22 14:...
Ce		jcu...	2014-01-13 08:...
dst		jcu...	2014-06-29 20:...
fgg		jcu...	2014-06-29 20:...
fsc		jcu...	2014-06-29 21:...
fsdfsd		cisar@frov.jcu...	2014-06-29 20:...
ghjgjutzh		cisar@frov.jcu...	2014-01-21 15:...
gjgh		cisar@frov.jcu...	2014-01-21 15:...

# How to create new protocol template – template designer



- Protocol template designer is shown in the main window
- User can start to edit template by adding and modifying the components
- First and last tab are mandatory and can not be changed by user

The screenshot shows the 'Template Designer' window in a software application. The interface includes a ribbon menu at the top with options like 'Load', 'Save to file', 'Save to database', 'Analyze', 'Clone', 'Terminology', 'View protocol', and 'Setting'. Below the ribbon is a 'Protocol Templates' tab with a 'Biocompatib' sub-tab. The main workspace is divided into several sections:

- Protocol controls:** A list of components to be added to the template, including Groupbox, Buttons, Number, Date/Time, Checkbox, Image, DropDown, Label, Protocol link, QRCode, Table, Text, Rich text, and Hyper link.
- Properties:** A table showing the properties of the selected component.
- Template window:** A preview of the template being designed, showing a QR code and two text input fields labeled 'Name of experiment:' and 'Name of experimentalist:'.

Name	Value
Name	Name of experiment:
Label position	Left
External	
ReadOnly	false
Mandatory	true

# How to edit protocol template – template designer



1. Click on Edit on Protocol templates tab
  - Protocol designer tool is executed
2. Double click on template in the list
  - Finalized templates can not be modified

The screenshot shows the 'Protocol Template Tools' interface. The 'Protocol Templates' tab is active, and the 'Edit' button is circled in red. Below the toolbar is a table of protocol templates.

	Name	Description	Author	Last Change
✿	ASDSA		cisar@frov.jcu.cz	2014-01-21 10:38
✓	Bio-compatibility	Bio-compatibility using direct contact	cisar@frov.jcu.cz	2013-12-17 12:22
✓	Bio-compatibility	Bio-compatibility nanopartcles	cisar@frov.jcu.cz	2013-12-17 12:30
✿	Bio-compatibility - ...		cisar@frov.jcu.cz	2014-01-22 14:16
✓	Cell segmentation	Time-lapse image processing - colony segmentation	cisar@frov.jcu.cz	2014-01-13 08:52
✿	dsf		cisar@frov.jcu.cz	2014-06-29 20:33
✿	fggfgg		cisar@frov.jcu.cz	2014-06-29 20:37
✿	fsdfds		cisar@frov.jcu.cz	2014-06-29 21:27
✿	fsdfs		cisar@frov.jcu.cz	2014-06-29 20:28
✿	ghjgjutzh		cisar@frov.jcu.cz	2014-01-21 15:41
✿	gjgh		cisar@frov.jcu.cz	2014-01-21 15:37
✓	jjj		cisar@frov.jcu.cz	2013-08-08 14:47
✓	mean val1		cisar@frov.jcu.cz	2014-02-27 14:39
✓	mean val2		cisar@frov.jcu.cz	2014-02-27 14:44
✓	PLuginMean		cisar@frov.jcu.cz	2014-02-05 13:18
✓	PLuginMean_clone		cisar@frov.jcu.cz	2014-02-05 13:26
✿	s		cisar@frov.jcu.cz	2014-01-22 14:33
✿	sa		cisar@frov.jcu.cz	2014-01-23 08:23
✓	sample image		cisar@frov.jcu.cz	2014-01-24 13:13
✓	Sample-preparation -...	Preparation of material for bio-compatibility test	cisar@frov.jcu.cz	2013-12-17 12:28
✿	sdfasefdsa		cisar@frov.jcu.cz	2014-02-04 15:53

# Design protocol template – template designer



- Protocol template designer allow the user to design new or modify existing protocol
- Protocol template should contain all the important information about setting of experiment:
  - Setting of devices
  - Initial conditions
  - Illustrative samples
  - Important steps of experiment
- The user should divide the template into logical part that corresponds to the different areas of the experiment
- The information in the template should allow to repeat or reproduce the experiment

# Design protocol template – template designer



- The protocol is divided into four main parts
  - Mandatory information (user can not change it – describes basic information for experiment identification) – **can be changed by user**
    - QR code
    - Name of experimentalist
    - Name of protocol
  - Protocol – **user defined components**
  - Information about the experimental data – **can not be changed by user**

- ## Components

- The designer is using 14 basic components for protocol definition
  - User input
    - Buttons
    - Number
    - Checkbox
    - Date/time
    - DropDown
    - Table
    - Text
    - Rich text
  - Informative
    - Groupbox
    - Image
    - Label
    - QR code
  - Links
    - Hyper link
    - Protocol link
- The components are internally described by XML language
- Final protocol template is stored into XML file and can be open by any XML editor

# Design protocol template – template designer



- Template is designed draw-drop method using predefined controls.
- Drag the control from Protocol controls and drop it to template

The screenshot displays the 'Template Designer' interface for 'Biocompatibility - BioWES'. The interface includes a ribbon with tabs for 'Home' and 'Template Designer', and a 'Protocol Templates' pane. The 'Protocol controls' pane lists various controls such as Groupbox, Buttons, Number, Date/Time, Checkbox, Image, DropDown, Label, Protocol link, QRCode, Table, Text, Rich text, and Hyper link. The 'Properties' pane shows the properties for the selected 'Label' component, including Name, Label position, External, ReadOnly, and Mandatory. The main design area shows a grid with a 'label' component added to the template.

**Component property**

**Added component**

Name	Value
Name	label
Label position	Left
External	
ReadOnly	false
Mandatory	true

# Design protocol template – template designer



- Change the component property in property window
- Click on the property and select one possibility or insert text
- Confirm by enter

The screenshot shows the 'Template Designer' window for 'Biocompatibility - BioWES'. The interface includes a ribbon with 'Home' and 'Template Designer' tabs, and a toolbar with icons for 'Load', 'Save to file', 'Save to database', 'Finalize', 'Clone', 'Terminology Standardization', 'View protocol', and 'Setting'. The main workspace displays a protocol template with a grid and a 'label' component. A callout box points to the 'label' component, labeled 'Active component'. Another callout box points to the 'Label position' property in the 'Properties' window, labeled 'Changed property'. The 'Properties' window shows the following table:

Name	Value
Name	label
Label position	Left
External	Left
ReadOnly	Top
Mandatory	true



# Design protocol template – template designer



- Size and position of component can be changed – left click and mouse move
- add tab – right click on active tab and select add
- delete component – right click on the component and select delete - all sub components will be deleted (groupbox)

The screenshot shows the 'Template Designer' application window. The title bar reads 'Biocompatibility - BioWES'. The ribbon includes 'Home' and 'Template Designer' tabs. The 'Template Designer' ribbon has several groups of icons: 'Edit' (Load, Save to file, Save to database, Finalize, Clone), 'Terminology Standardization' (Terminology), 'View' (View protocol), and 'Setting' (Setting). Below the ribbon, there are tabs for 'Protocol Templates' and 'Biocompatibility'. The main workspace is divided into 'Protocol controls' on the left and a design canvas on the right. The 'Protocol controls' panel lists various components: Groupbox, Buttons, Number, Date/Time, Checkbox, Image, DropDown, Label, Protocol link, QRCode, Table, Text, Rich text, and Hyper link. The 'Properties' panel at the bottom left shows a table with 'Name' and 'Value' columns, with 'Name' set to 'Specimen'. The design canvas shows a grid with several form elements: 'Mandatory information', 'Specimen', 'Microscopy', 'Measurement', and 'Experimenta'. A context menu is open over the 'Specimen' tab, with 'Add' and 'Delete' options highlighted by a red circle. The form elements include dropdown menus for 'Cell line', 'Specimen type', and 'Testing method', and a text input field for 'Cell preparation'.

# Design protocol template – template designer



- Common properties
  - Mandatory
    - false – user need not to fill the component in protocol (information is not critical for reproducibility)
    - true – user has to fill the component in protocol

The screenshot shows the 'Template Designer' application window. The title bar reads 'Biocompatibility - BioWES'. The ribbon includes 'Home' and 'Template Designer' tabs. The 'Template Designer' ribbon has several groups of icons: 'Edit' (Load, Save to file, Save to database, Finalize, Clone), 'Terminology Standardization' (D icon), 'View' (View protocol), and 'Setting' (Setting icon). Below the ribbon, there are tabs for 'Protocol Templates' and 'Biocompatibility'. The main workspace is a grid with a 'Mandatory information' tab selected. A 'label' component is placed on the grid. To the left is a 'Protocol controls' panel with various widget icons like Groupbox, Buttons, Number, Date/Time, Checkbox, Image, DropDown, Label, Protocol link, QRCode, Table, Text, Rich text, and Hyper link. Below that is a 'Properties' panel with a table:

Name	Value
Name	label
Label position	Left
External	
ReadOnly	false
Mandatory	true

The 'Mandatory' property value 'true' is circled in red. The main workspace also has tabs for 'Specimen', 'Microscopy', 'Measurement', and 'Experiment'.

- ## Components

- The designer is using 14 basic components for protocol definition
  - User input
    - Buttons
    - Number
    - Checkbox
    - Date/time
    - DropDown
    - Table
    - Text
    - Rich text
  - Informative
    - Groupbox
    - Image
    - Label
    - QR code
  - Links
    - Hyper link
    - Protocol link
- The components are internally described by XML language
- Final protocol template is stored into XML file and can be open by any XML editor

# Design protocol template – components



## Tab

- Devide protocol into logical parts

Protocol controls

- Groupbox
- Buttons
- 1.0 Number
- Date/Time
- Checkbox
- Image
- DropDown
- Label
- Protocol link
- QRCode
- Table
- Text
- Rich text
- Hyper link

Properties

Name	Value
Name	Specimen

Change tab name in property window

- Properties:
  - Name – tab name appears in the protocol

# Design protocol template – components



## GroupBox

- Encapsulate group of components

The screenshot shows the 'Template Designer' application window. The title bar reads 'Biocompatibility - BioWES'. The ribbon includes 'Home' and 'Template Designer' tabs. The 'Template Designer' ribbon has several groups of icons: 'Edit' (Load, Save to file, Save to database, Finalize, Clone), 'Standardization' (Terminology), 'View' (View protocol), and 'Setting' (Setting). Below the ribbon, there are tabs for 'Protocol Templates' and 'Biocompatibility'. The main workspace is divided into 'Protocol controls' on the left and a design canvas on the right. The 'Protocol controls' panel lists various components: Groupbox, Buttons, Number, Date/Time, Checkbox, Image, DropDown, Label, Protocol link, QRCode, Table, Text, Rich text, and Hyper link. The 'Properties' window at the bottom left shows a table with 'Name' and 'Value' columns. The 'Camera' groupbox is selected, and its name 'Camera' is highlighted in the 'Name' column. A red box highlights the 'Camera' groupbox on the design canvas, which contains a 'Camera type' dropdown, 'Model' and 'Focus' text boxes, and an 'Exposure' spinner set to '0.00 ms'. A callout box points to the 'Camera' name in the properties window with the text: 'Change groupbox name in property window'.

Name	Value
Name	Camera

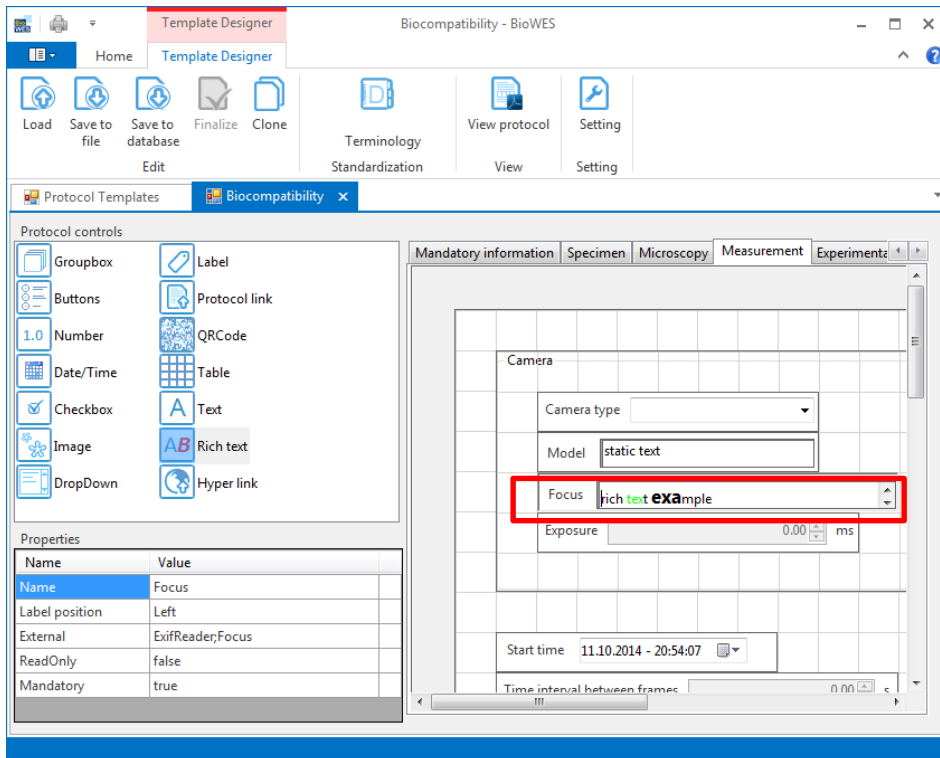
- Properties:
  - Name – groupbox name appears in the protocol
- New components are added into active groupbox

# Design protocol template – components



## Rich text

- Component for formatted text input



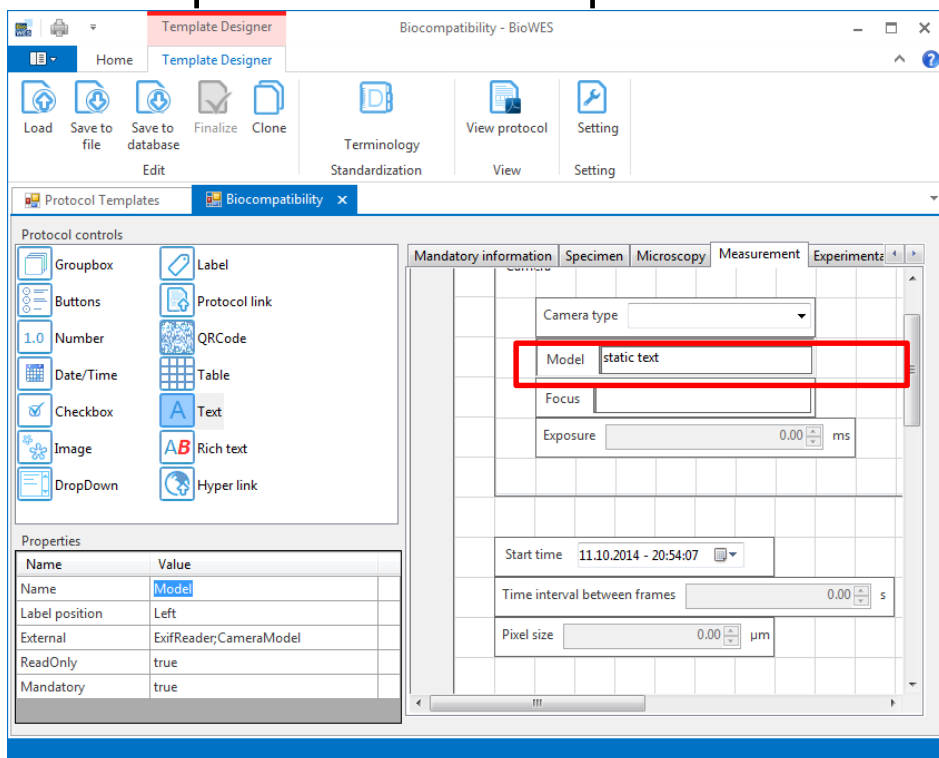
- Properties:
  - Name – name of the component
  - Label position – left/top – defines position of name
  - External – name of the Plugin used for automatic filling of the component
  - ReadOnly – true/false – defines if the inserted text is read only or user can modify text in protocol

# Design protocol template – components



## Text

- Component for text input



- Properties:
  - Name – name of the component
  - Label position – left/top – defines position of name
  - External – name of the Plugin used for automatic filling of the component
  - ReadOnly – true/false – defines if the inserted text is read only or user can modify text in protocol

# Design protocol template – components



## Hyper link

- Creates text box for web address – active link in PDF file
- Usually used for specification of the equipment

The screenshot shows the 'Template Designer' window for 'Biocompatibility - BioWES'. The interface includes a ribbon with 'Home' and 'Template Designer' tabs, and a toolbar with icons for 'Load', 'Save to file', 'Save to database', 'Finalize', 'Clone', 'Terminology Standardization', 'View protocol', and 'Setting'. The main workspace is divided into 'Protocol Templates' and 'Biocompatibility' sections. The 'Protocol controls' panel on the left lists various components, with 'Hyper link' selected. The 'Properties' panel at the bottom left shows the following details:

Name	Value
Name	External link
Link	<a href="http://www.biowes.com">www.biowes.com</a>
ReadOnly	false
Mandatory	true

The main workspace displays a grid with a red box highlighting an 'External link' component containing the text 'External link' and the URL 'www.biowes.com'. The workspace also shows tabs for 'Mandatory information', 'Specimen', 'Microscopy', 'Measurement', and 'Experimenta'.

- Properties:
  - Name – name of the component
  - Link – link to external web page



# Design protocol template – components



## Buttons

- Creates N buttons with user defined names
- Just one button can be active at a time
- Usually used for selection of one possibility

The screenshot shows the 'Template Designer' application window. The ribbon includes 'Home' and 'Template Designer' tabs. The 'Buttons' group contains icons for 'Load', 'Save to file', 'Save to database', 'Finalize', and 'Clone'. The 'Edit' group contains icons for 'Terminology Standardization', 'View protocol', and 'Setting'. The 'Protocol Templates' list shows 'Biocompatibility' is selected. The 'Protocol controls' panel on the left lists various components: Groupbox, Buttons, Number, Date/Time, Checkbox, Image, DropDown, Label, Protocol link, QRCode, Table, Text, Rich text, and Hyper link. The 'Properties' table at the bottom left is as follows:

Name	Value
Label	Contrast
Orientation	Vertical
Buttons	
1)	Bright field
2)	Dark field

Callouts in the image:

- Add buttons**: Points to the 'Buttons' icon in the 'Protocol controls' panel.
- Define what components will be enabled if this button is active**: Points to the 'Bright field' button in the template, which is highlighted with a red box.
- Move/delete button**: Points to the '+' and '-' icons in the 'Buttons' section of the 'Properties' table.

- **Properties:**
  - Label – text of buttons component
  - Orientation – vertical/horozintal – defines orientation of buttons

# Design protocol template – components



## Checkbox

- Creates N check boxes with user defined names
- It is usually used for passing several steps of the methods

The screenshot shows the 'Template Designer' window for 'Biocompatibility - BioWES'. The interface includes a ribbon with 'Home' and 'Template Designer' tabs, and a 'Protocol Templates' pane. The main workspace displays a form with fields for 'Type', 'Magnification', and 'Contrast'. A red box highlights the 'Contrast' field, which contains a checkbox. Three callout boxes provide instructions: 'Add checkbox' points to the 'Checkbox' icon in the 'Protocol controls' pane; 'Define what components will be enabled if this checkbox is active' points to the 'Bright field' and 'Dark field' options in the 'Properties' table; and 'Move/delete checkbox' points to the '+' and 'E' buttons in the 'Buttons' section of the 'Properties' table.

Name	Value
Label	Contrast
Orientation	Vertical
Buttons	
1)	Bright field
2)	Dark field

- Properties:
  - Label – text of checkbox component
  - Orientation – vertical/horizintal – defines orientation of checkboxes

# Design protocol template – components



## Buttons/checkbox – enable components

- Click on E button next to button name
- Enable/disable mode is activated
- Click on component – add/remove component from list of components enabled by particular button or one possibility
- Click on OK (red button) to finish Enable/disable mode

The screenshot shows the 'Template Designer' application window. The title bar reads 'Biocompatibility - BioWES'. The ribbon includes 'Home' and 'Template Designer' tabs. The 'Template Designer' ribbon contains buttons for 'Load', 'Save to file', 'Save to database', 'Finalize', 'Clone', 'Terminology Standardization', 'View protocol', and 'Setting'. Below the ribbon, a 'Protocol Templates' pane shows 'Biocompatibility' selected. The main workspace is titled 'Protocol controls' and contains a grid of controls. A 'Properties' table is visible at the bottom left.

Name	Value
Label	Contrast
Orientation	Vertical
Buttons	
1)	Bright field
2)	Dark field
3)	Phase contrast

The design canvas shows a form with the following elements:

- A 'Type' dropdown menu.
- A 'Magnification' dropdown menu.
- A 'Contrast' section with radio buttons for 'Bright field', 'Dark field', and 'Phase contrast'.
- A 'Filter' section with radio buttons for 'Yes' and 'No'.
- A 'Filter type' text input field.

Red boxes highlight the 'Magnification' dropdown, the 'Filter' radio buttons, and the 'Filter type' input field. A red 'OK' button is visible in the top right corner of the canvas area.

# Design protocol template – components



## Image

- Show the image in the protocol

The screenshot shows the 'Template Designer' application window. The main workspace displays a protocol template with several tabs: 'Mandatory information', 'Specimen', 'Microscopy', 'Measurement', and 'Experimental Data'. The 'Microscopy' tab is active, and a red-bordered image component is visible. The image shows a goldfish. A callout box labeled 'Select image' points to the image component. On the left, the 'Protocol controls' panel lists various components, with 'Image' selected. Below it, the 'Properties' table is shown.

Name	Value
Path	D:\prace\2010 BioWes\2014\AE2... <input type="button" value="..."/>
Label	Sample image
Label position	Below
ReadOnly	false
External	
Mandatory	false

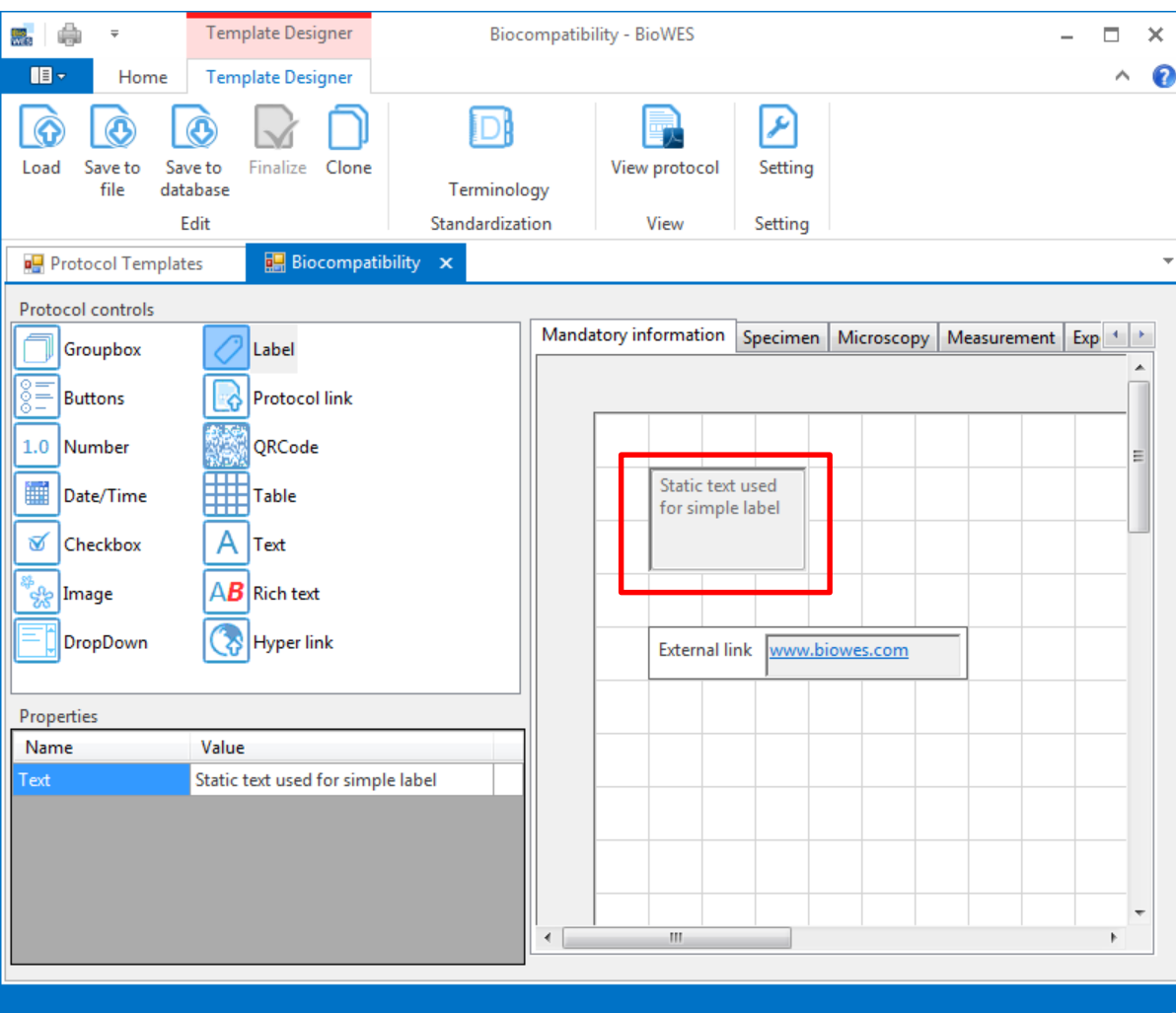
- Properties:
  - Path – full or relative path to the image
  - Label – text related to the image
  - Label position – Top/bottom – position of label
  - ReadOnly – true = user can not change image in protocol, false = user can add or change image in protocol

# Design protocol template – components



## Label

- The component is static text
- It is usually used for the comments or labels



- Properties:
  - Name – text which is shown in the form

# Design protocol template – components



## QR code

- Show QR code
- QR code contains protocol ID + protocol Name + protocol description
- Can be used for identification of the protocol

The screenshot shows the 'Template Designer' application window. The title bar reads 'Biocompatibility - BioWES'. The ribbon includes 'Home' and 'Template Designer' tabs. The 'Template Designer' ribbon has groups for 'Edit' (Load, Save to file, Save to database, Finalize, Clone), 'Terminology Standardization' (Terminology), 'View' (View protocol), and 'Setting' (Setting). Below the ribbon, there are tabs for 'Protocol Templates' and 'Biocompatibility'. The main workspace is titled 'Mandatory information' and contains a grid with several elements: 'Static text used for simple label', 'External link' with the value 'www.biowes.com', and a QR code highlighted with a red border. On the left, the 'Protocol controls' panel lists various components like Groupbox, Buttons, Number, Date/Time, Checkbox, Image, DropDown, Label, Protocol link, QRCode, Table, Text, Rich text, and Hyper link. At the bottom, a 'Properties' table is visible with columns for 'Name' and 'Value'.

# Design protocol template – components



## Table

- Standard table
- The cells filled in protocol template designer are disabled in final protocol

The screenshot shows the 'Template Designer' window for 'Biocompatibility - BioWES'. The interface includes a ribbon with 'Home' and 'Template Designer' tabs, and various tool icons like 'Load', 'Save to file', 'Save to database', 'Finalize', 'Clone', 'Terminology Standardization', 'View protocol', and 'Setting'. A 'Protocol Templates' pane on the left shows a 'Table' component selected. The main workspace displays a table with the following content:

Mandatory information	Specimen	Microscopy	Measurement	Exp
Static text	1	2		

The table is labeled 'Table 1'. A red box highlights the first row, and a blue arrow points to the second cell of that row. A callout box at the bottom right of the screenshot contains the text: "Cell is editable in final protocol because it was not filled in design".

**Properties:**

Name	Value
Columns	3
Rows	3
Label	Table description
Label position	Below

- **Properties:**
  - Columns/Rows – number of table columns and rows
  - Label – table description
  - Label position – top/bottom

# Design protocol template – components



## DropDown

- Component with predefined items

The screenshot shows the 'Template Designer' application window. The main workspace displays a form with a 'Cell line' dropdown menu highlighted by a red box. The dropdown menu is open, showing two options: 'MG63' and 'HeLa'. Below the dropdown are other form fields: 'Specimen type', 'Testing method', and 'Cell preparation'. On the left side, there is a 'Protocol controls' panel with various component icons, including 'DropDown'. Below that is a 'Properties' panel with a table showing the configuration for the selected 'Cell line' component.

Name	Value
Name	Cell line
Items	
1)	MG63
2)	HeLa
Units	
Editable	true

- Properties:
  - Name – text of component
  - Units – user can define unit for items
  - Editable – true/false – true= user can add new items in protocol, false = user can select only from predefined items



# Design protocol template – components



## Number

- Real numbers with units

The screenshot shows the 'Template Designer' window for 'Biocompatibility - BioWES'. The interface includes a ribbon with 'Home' and 'Template Designer' tabs, and a 'Protocol Templates' pane. The 'Number' control is selected in the 'Protocol controls' pane. The 'Exposure' control is highlighted in the main design area, showing a value of 0.00 ms. The 'Properties' pane is open, displaying the following details for the 'Exposure' control:

Name	Value
Name	Exposure
Decimal places	2
Units	ms
External	ExifReader;Exposure
Mandatory	true

- Properties:
  - Name – text of number
  - Decimal places - number of shown decimal places
  - Units – units of number

# Design protocol template – components



## Date/time

- Information about data, time or combined data+time

The screenshot shows the 'Template Designer' window for 'Biocompatibility - BioWES'. The interface includes a ribbon with 'Home' and 'Template Designer' tabs, and a 'Protocol Templates' pane with 'Biocompatibility' selected. The main workspace displays a form with various controls. A 'Date/Time' control is highlighted with a red box, showing the value '11.10.2014 - 20:54:07'. A callout box points to the 'Time format' dropdown in the Properties pane, which is set to '14:30:25'. The Properties pane also shows the 'Name' as 'Start time' and the 'Type' as 'date+time'.

Name	Value
Name	Start time
Type	date+time
Date format	30.01.2001
Time format	14:30:25
External	14:30:25
Mandatory	14:30 02:30:25 pm 02:30 pm

Select time format

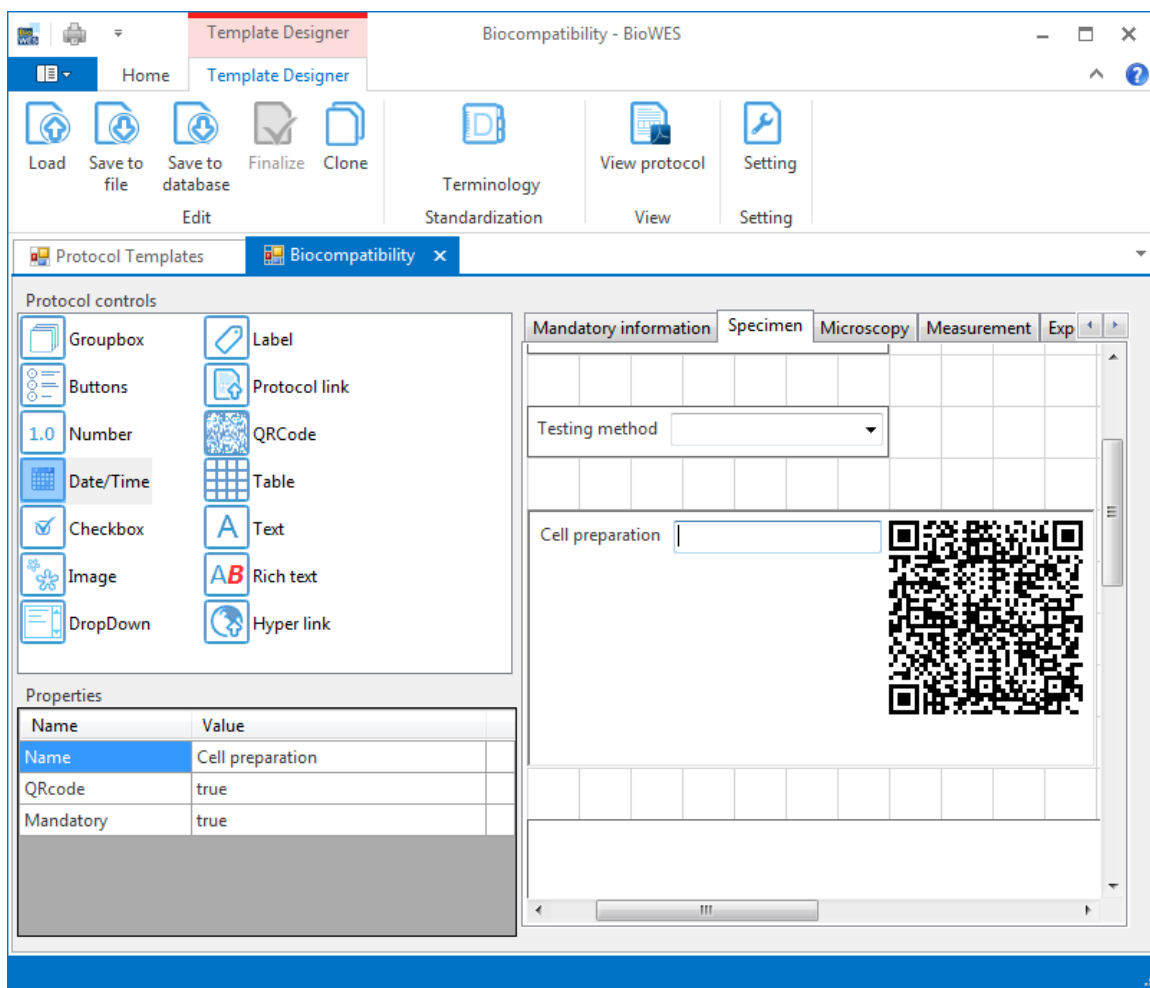
- Properties:
  - Name – text of data/time
  - Type – data only/time only/ data+time
  - Date format – defines format of date
  - Time format – defines format of time

# Design protocol template – components



## Protocol link

- Direct link to other protocols
- Click (+ Ctrl) show linked protocol



- Properties:
  - Name – text of link
  - QR code – true/false – true QR code of linked protocol is shown

# Design protocol template – standardization



## Standardization

- Click on menu – Terminology
- The window for definition of OWL file appears
- Insert link to OWL file
- Check – use terminology

The screenshot shows the 'Template Designer' window in the 'Biocompatibility - BioWES' environment. The 'Terminology' button in the ribbon is circled in red. A 'Manage terminology' dialog box is open, displaying a 'Terminology hierarchy' tree with 'reproduction trait' selected. A 'Define path to standard' dialog box is overlaid on top, with the 'Web link' field containing the URL [http://www.atol-ontology.com/ontology/12092013/atol\\_v6.owl](http://www.atol-ontology.com/ontology/12092013/atol_v6.owl) circled in red. Below this, the 'List of standards' section shows the same URL. At the bottom of the 'Manage terminology' dialog, the 'Use terminology' checkbox is checked and circled in red.

# Design protocol template – standardization



## Standardization

- The terms from terminology will be offered to the user during inserting the name of components

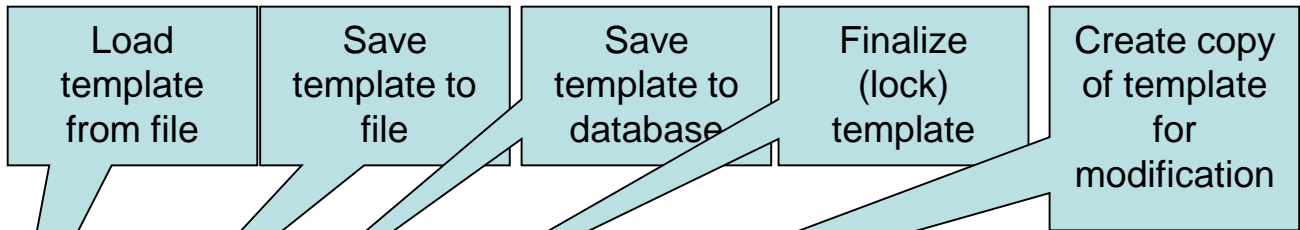
The screenshot shows the 'Template Designer' window in 'Biocompatibility - BioWES'. The interface includes a ribbon with 'Home' and 'Template Designer' tabs, and a toolbar with icons for 'Load', 'Save to file', 'Save to database', 'Finalize', 'Clone', 'Terminology Standardization', 'View protocol', and 'Setting'. The 'Protocol Templates' pane is open, showing a list of 'Protocol controls' (Groupbox, Buttons, Number, Date/Time, Checkbox, Image, DropDown) and a 'Properties' table. A red circle highlights a dropdown menu for the 'Name' property, which lists various biological terms. The 'male fertility' term is selected. The main workspace shows a grid with a 'Type' dropdown, a 'Magnification' dropdown, and a 'Contrast' section with radio buttons for 'Bright field', 'Dark field', and 'Phase contrast'.

Name	M
1)	4
2)	10
3)	20
4)	40

Terminology list (circled in red):

- magnum trait
- machine milk volume
- major mineral element require
- male accessory glands morpho
- male courtship
- male fertility
- male gamete production
- male genital tract morphology
- male germ cells number
- male hormone fetal secretion
- male meiosis
- male reproductive behaviour
- male reproductive feature
- male sexual behaviour
- mammary 1-acylglycerol-3-ph
- mammary ABCG1 mRNA cont

# Design protocol template – template manipulation



Change protocol template settings

Show the protocol how it will look for the user

Name	Value
Name	M
Items	
1)	4
2)	10
3)	20
4)	40

# How to create new protocol from template – protocol generator



1. Click on Add on Protocol tab
  - Protocol generator tool is executed
2. Define the name of new protocol
3. Define the protocol template for the protocol
4. Define parent of protocol (concatenation of protocols)

The screenshot shows the 'Protocols - BioWes' application interface. The 'Add' button in the 'Protocols' tab is circled in red. A 'Define New Protocol' dialog box is open, with the following fields circled in red:

- Name: Bio compatibility
- Protocol template: t
- Source protocols: 1234567

The background shows a table of protocols with columns for Name, Description, User, and Date. The table is partially obscured by the dialog box.

Name	Description	User	Date
Měření bakterií 27	Definice pro měření počtu bakterií	bivi@datapartner...	7/2/2013
Měření bakterií 28	Definice pro měření počtu bakterií	bivi@datapartner...	7/2/2013
Měření bakterií 29	Definice pro měření počtu bakterií	bivi@datapartner...	7/2/2013
Měření bakterií 30	Definice pro měření počtu bakterií	vojtech osvald	7/2/2013
Měření bakterií 32	Definice pro měření počtu bakterií	vojtech osvald	7/2/2013
Měření bakterií 34	Definice pro měření počtu bakterií	vojtech osvald	7/2/2013
Měření bakterií 35	Definice pro měření počtu bakterií	vojtech osvald	7/2/2013
Měření bakterií 36	Definice pro měření počtu bakterií	vojtech osvald	7/2/2013

# How to create new protocol from template – protocol generator



- Protocol is generated
- The user can fill the information about the experiment
  - All mandatory information about experiment (defined in template)
- User can use predefined recommendations
- The protocol can be used as guide through the experiment if the template was designed for

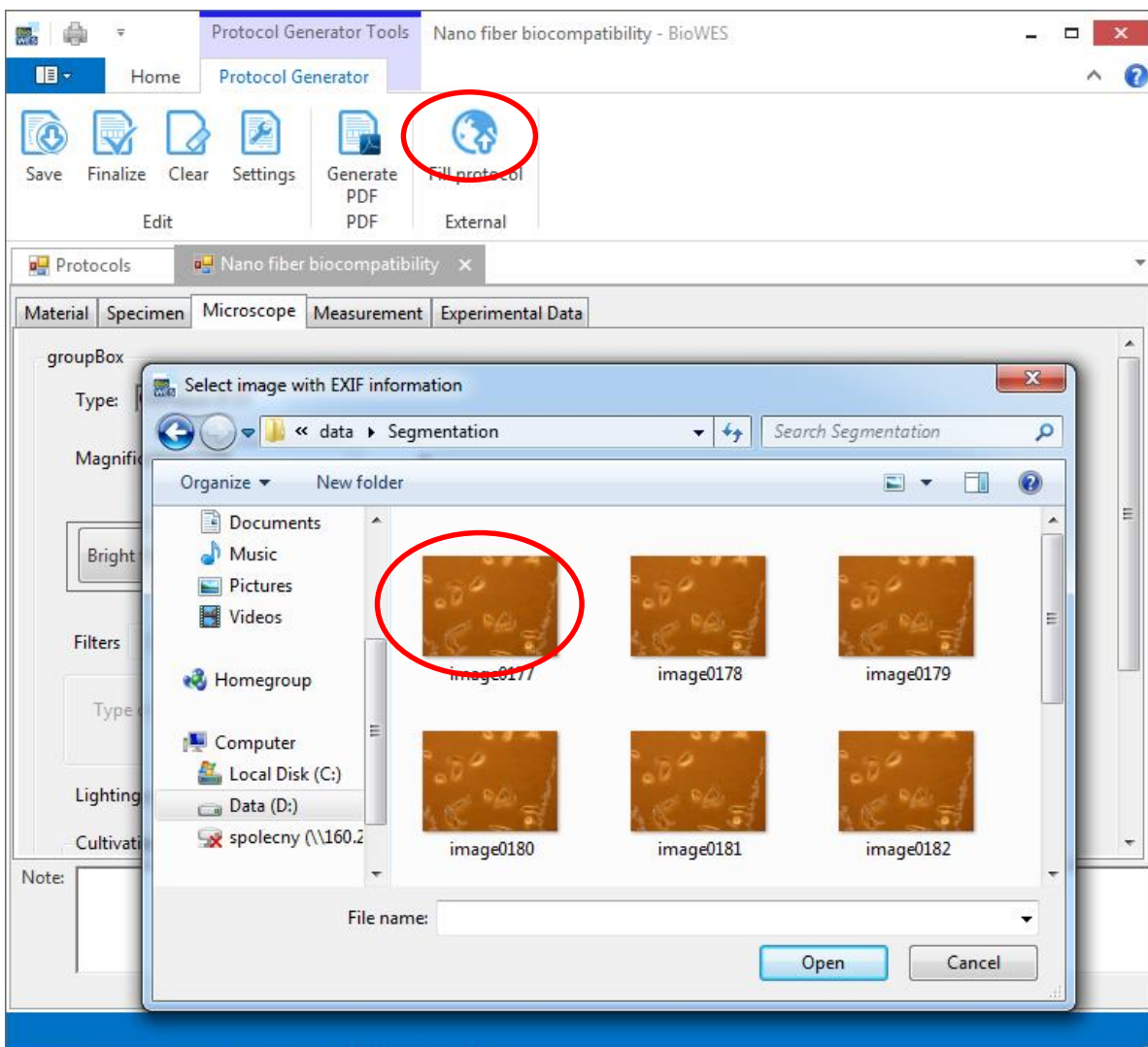
The screenshot shows the 'Protocol Generator Tools' application window. The title bar reads 'Protocol Generator Tools Nano fiber biocompatibility - BioWES'. The interface includes a ribbon with 'Home' and 'Protocol Generator' tabs. The 'Protocol Generator' ribbon contains buttons for 'Save', 'Finalize', 'Clear', 'Settings', 'Generate PDF', and 'Fill protocol External'. Below the ribbon is a 'Protocols' list with 'Nano fiber biocompatibility' selected. The main workspace has tabs for 'Material', 'Specimen', 'Microscope', 'Measurement', and 'Experimental Data'. The 'Microscope' tab is active, showing a 'groupBox' with the following fields: 'Type: Olympus IX 51', 'Magnification: 10X', 'Type of scanning' (with buttons for 'Bright field', 'Dark field', and 'Phase contrast'), 'Filters' (with radio buttons for 'Yes' and 'No'), 'Type of filter:', 'Lighting conditions: Scan only', and 'Cultivation conditions'. A 'Note:' field is at the bottom.



# How to create new protocol from template – fill protocol



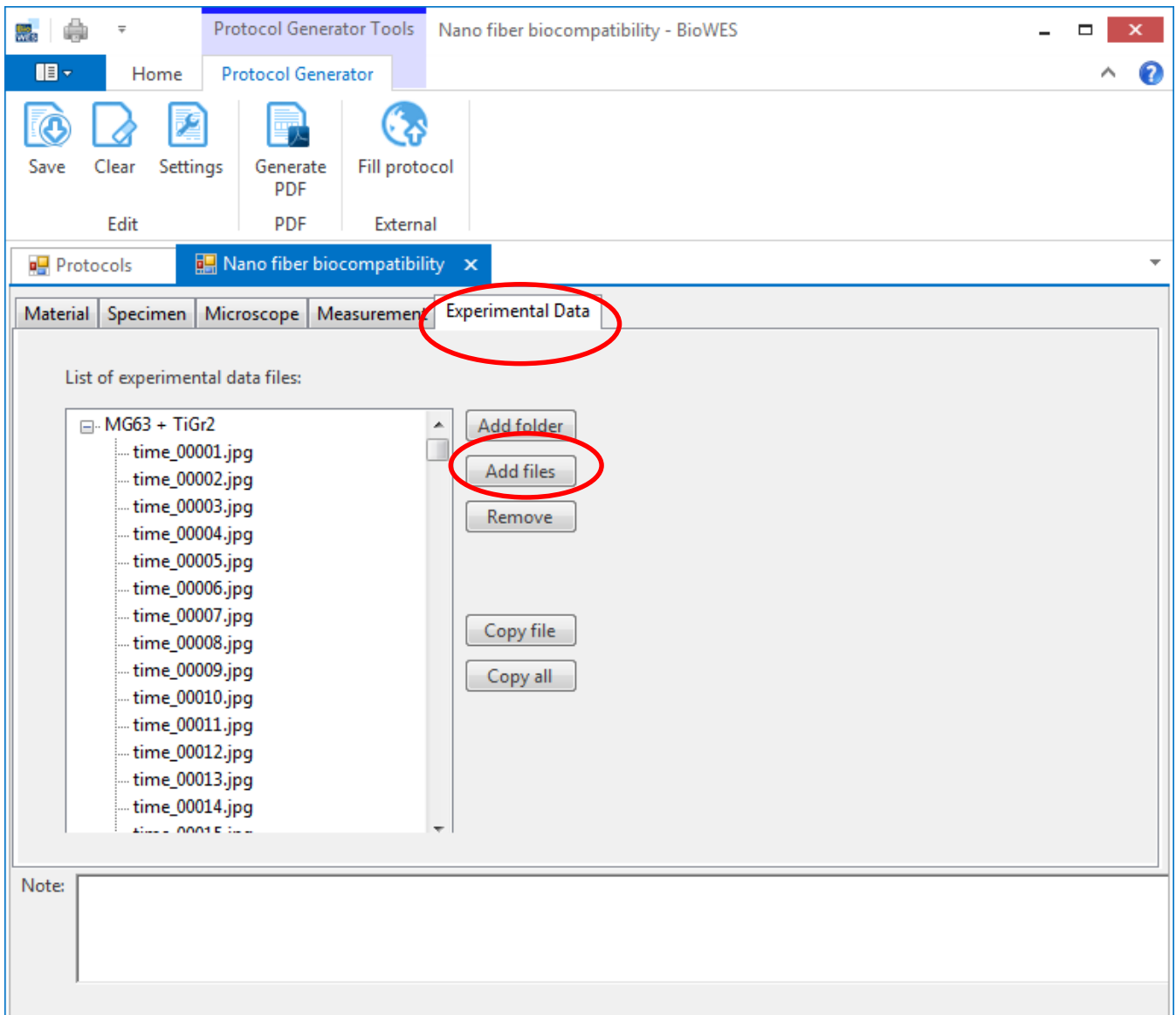
- Fill information using plug-in (it has to be defined in template)
- Click on Menu – Fill protocol
- The plug-in will ask for file with external information and try to read it



# How to create new protocol from template – attach data



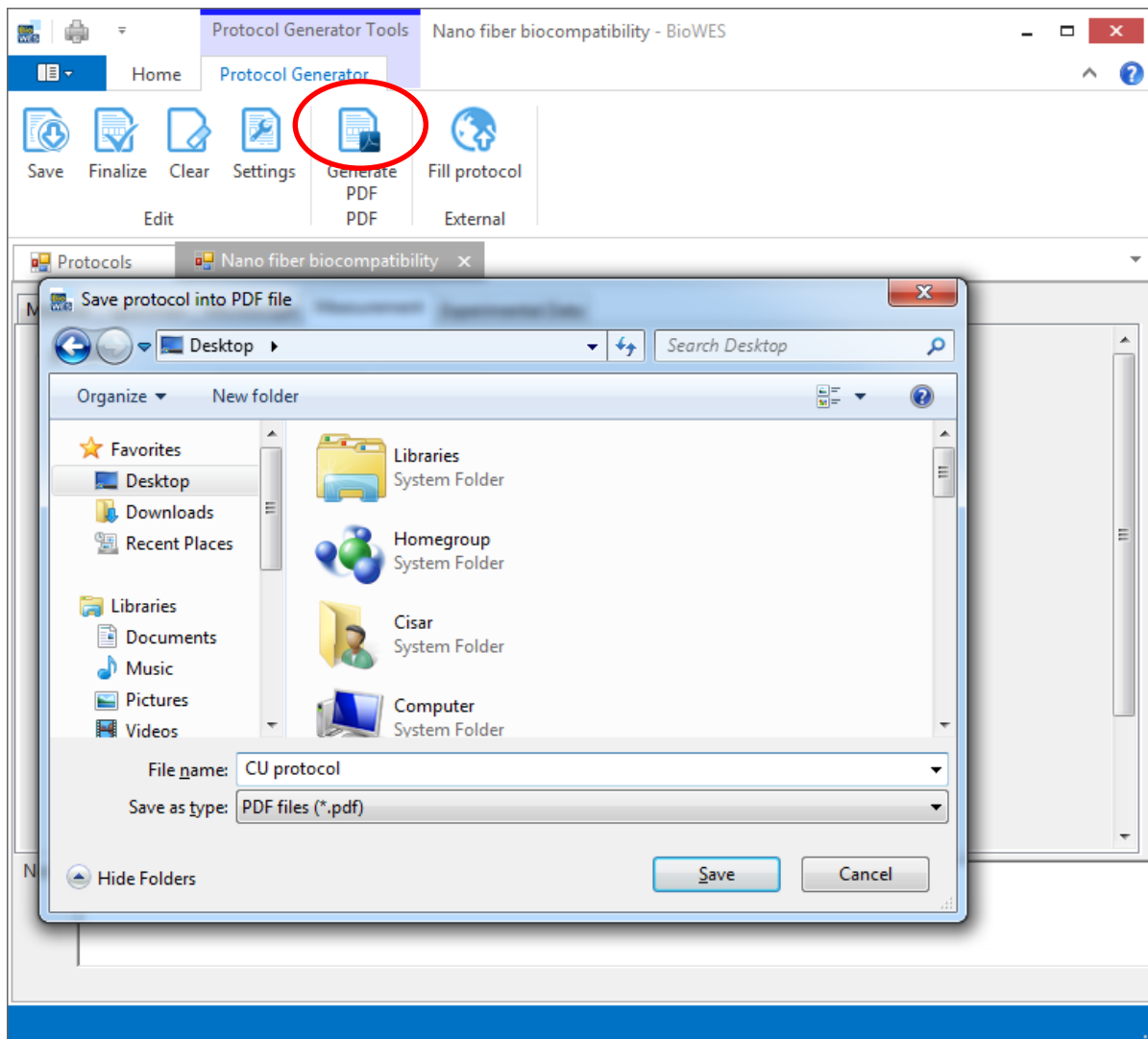
- The tab Experimental data allow user to attach experimental data to the protocol
- The link between protocol (metadata) and data is created



# How to create new protocol from template – PDF



- Protocol can be generated into PDF file for printing in several different formats
- Select Menu – Generate PDF
- See “PDF prinfn.pdf” document for more information



# How to create new protocol from template – Save



- Save protocol and data into local database
- Protocol and data can be still modified

A screenshot of the 'Protocol Generator Tools' software interface. The window title is 'Nano fiber biocompatibility - BioWES'. The ribbon menu is set to 'Protocol Generator' and includes buttons for 'Save', 'Finalize', 'Clear', 'Settings', 'Generate PDF', and 'Fill protocol'. The 'Save' button is circled in red. Below the ribbon, there are tabs for 'Material', 'Specimen', 'Microscope', 'Measurement', and 'Experimental Data'. The 'Microscope' tab is active, showing a 'groupBox' with fields for 'Type' (Olympus IX 51), 'Magnification' (10X), 'Type of scanning' (Bright field, Dark field, Phase contrast), 'Filters' (Yes/No), 'Type of filter', 'Lighting conditions' (Scan only), and 'Cultivation conditions'. A 'Note' field is visible at the bottom.

# How to create new protocol from template – Finalize



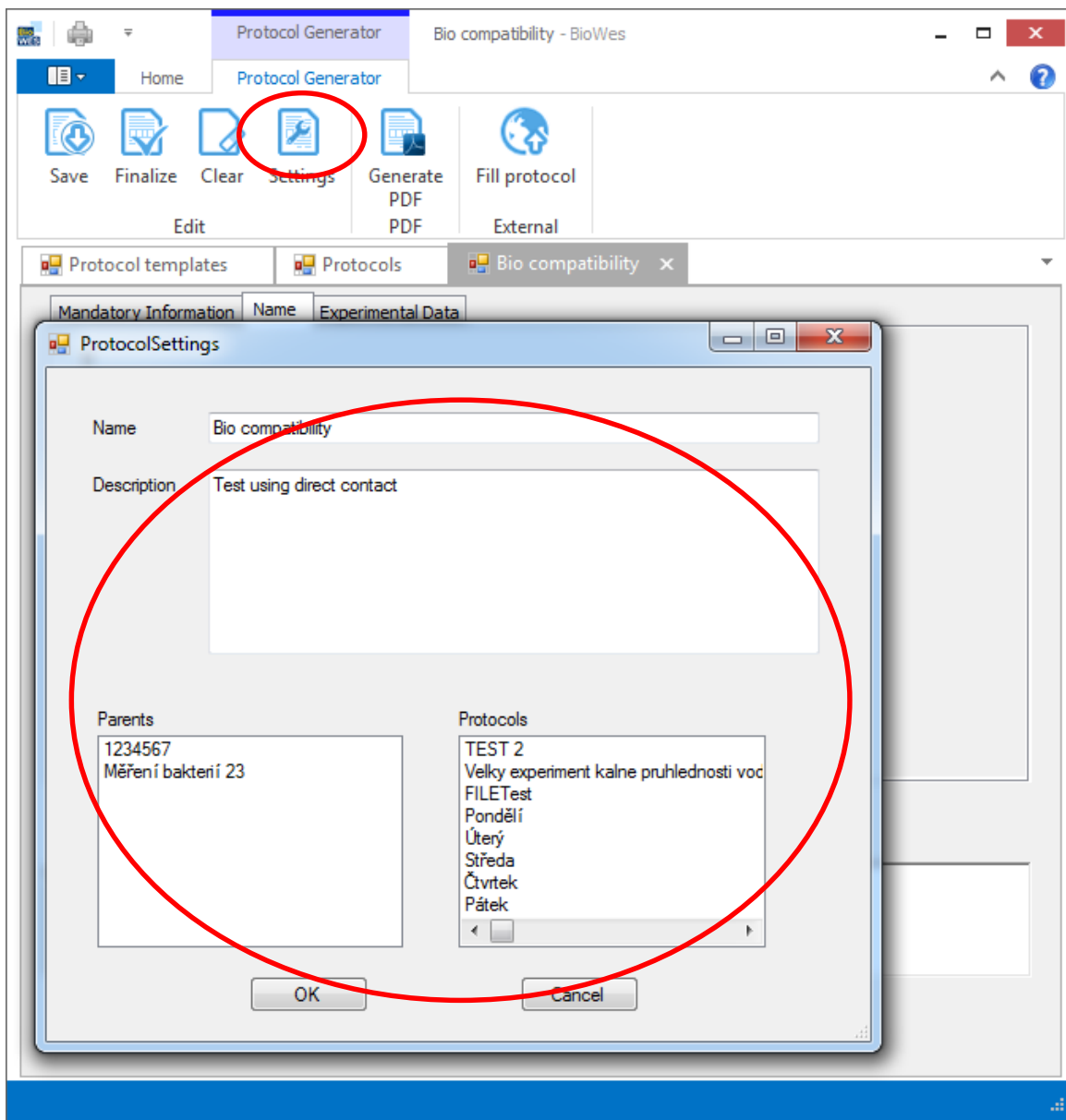
- Save protocol and data into local database
- Protocol is locked and cannot be modified
- All mandatory fields have to be filled in

The screenshot shows the 'Protocol Generator Tools' application window. The title bar reads 'Nano fiber biocompatibility - BioWES'. The 'Protocol Generator' tab is active, showing a ribbon with buttons: Save, Finalize, Clear, Settings, Generate PDF, and Fill protocol. The 'Finalize' button is circled in red. Below the ribbon, the 'Protocols' section shows a tab for 'Nano fiber biocompatibility'. The main workspace has tabs for 'Material', 'Specimen', 'Microscope', 'Measurement', and 'Experimental Data'. The 'Microscope' tab is active, displaying a 'groupBox' with fields for 'Type', 'Magnification' (set to 10X), 'Type' (with 'Bright field' and 'Dark field' buttons), 'Filters' (radio buttons for 'Yes' and 'No'), 'Type of filter', 'Lighting conditions' (set to 'Scan only'), and 'Cultivation conditions'. A dialog box is open in the center with the message 'All necessary items have to be fulfilled (marked by red)' and an 'OK' button circled in red. A 'Note:' field is visible at the bottom.

# How to create new protocol from template – settings



- Change name and description of protocol
- Change parents of protocol – concatenation of protocols



# How to edit/read protocol – protocol generator



- Click on Edit on Protocol tab or double click on protocol
  - Protocol generator tool is executed
  - Only the owner (creator) of protocol can change the protocol
  - The rest of users can only download data

Protocols - BioWES

Home Protocols

Refresh Add Edit Upload

Protocols Nano fiber biocompatibility

Drag a column header here to group by that column

Name	Description	Author	Last Change
1ttttt		cisar@frov.jcu.cz	2013-11-06 14:38
asdfg	sadsadasdsa	cisar@frov.jcu.cz	2013-12-05 15:15
asdsad		cisar@frov.jcu.cz	2014-01-24 13:24
Cell migration		cisar@frov.jcu.cz	2013-12-10 10:09
Cell migration	Testing of cell miration on the TiGR material using direct ...	cisar@frov.jcu.cz	2013-12-10 10:06
Experiment generation 1		cisar@frov.jcu.cz	2014-03-17 15:07
Experiment generation 2		cisar@frov.jcu.cz	2014-03-17 14:44
Experiment generation 3		cisar@frov.jcu.cz	2014-03-17 14:47
Experiment generation 4		cisar@frov.jcu.cz	2014-03-17 15:01
Experiment generation 5		cisar@frov.jcu.cz	2014-03-17 15:07
fgdhtj	Time-lapse image processing - colony segmentation	cisar@frov.jcu.cz	2014-01-21 15:19
gaga		cisar@frov.jcu.cz	2013-08-07 15:49
Měření bakterií 51	Definice pro měření počtu bakterií	cisar@frov.jcu.cz	2013-07-02 14:56
Nano fiber - Segmentation - M...	Time-lapse image processing - colony segmentation	cisar@frov.jcu.cz	2014-01-13 08:54
<b>Nano fiber biocompatibility</b>	<b>Bio-compatibility nanopartcles</b>	cisar@frov.jcu.cz	2013-12-17 12:31
Nano fiber preparation - Medesa	Preparation of material for bio-compatibility test	cisar@frov.jcu.cz	2013-12-17 12:56
první protokol	zm	cisar@frov.jcu.cz	2014-04-22 12:05
test input data		cisar@frov.jcu.cz	2014-02-06 12:48
test rights		cisar@frov.jcu.cz	2014-01-23 12:25
testtable		cisar@frov.jcu.cz	2014-02-06 12:31

Record 33 of 38

# How to edit/read protocol – protocol generator



- Click on Edit on Protocol tab or double click on protocol
  - Protocol generator tool is executed
  - Only the owner (creator) of protocol can change the protocol
  - The rest of users can only download data

The screenshot shows the BioWES Protocols interface. The 'Edit' button in the top navigation bar is circled in red. Below it, a table lists various protocols. The 'Nano fiber biocompatibility' protocol is highlighted with a blue background and a red circle around its name.

Name	Description	Author	Last Change
1ttttt		cisar@frov.jcu.cz	2013-11-06 14:38
asdfg	sadsadasdsa	cisar@frov.jcu.cz	2013-12-05 15:15
asdsad		cisar@frov.jcu.cz	2014-01-24 13:24
Cell migration		cisar@frov.jcu.cz	2013-12-10 10:09
Cell migration	Testing of cell miration on the TiGR material using direct ...	cisar@frov.jcu.cz	2013-12-10 10:06
Experiment generation 1		cisar@frov.jcu.cz	2014-03-17 15:07
Experiment generation 2		cisar@frov.jcu.cz	2014-03-17 14:44
Experiment generation 3		cisar@frov.jcu.cz	2014-03-17 14:47
Experiment generation 4		cisar@frov.jcu.cz	2014-03-17 15:01
Experiment generation 5		cisar@frov.jcu.cz	2014-03-17 15:07
fgdhtj	Time-lapse image processing - colony segmentation	cisar@frov.jcu.cz	2014-01-21 15:19
gaga		cisar@frov.jcu.cz	2013-08-07 15:49
Měření bakterií 51	Definice pro měření počtu bakterií	cisar@frov.jcu.cz	2013-07-02 14:56
Nano fiber - Segmentation - M...	Time-lapse image processing - colony segmentation	cisar@frov.jcu.cz	2014-01-13 08:54
<b>Nano fiber biocompatibility</b>	<b>Bio-compatibility nanopartcles</b>	cisar@frov.jcu.cz	2013-12-17 12:31
Nano fiber preparation - Medesa	Preparation of material for bio-compatibility test	cisar@frov.jcu.cz	2013-12-17 12:56
první protokol	zm	cisar@frov.jcu.cz	2014-04-22 12:05
test input data		cisar@frov.jcu.cz	2014-02-06 12:48
test rights		cisar@frov.jcu.cz	2014-01-23 12:25
testtable		cisar@frov.jcu.cz	2014-02-06 12:31



# BioWes

<http://www.biowes.org>