StarCellBio USER GUIDE

GENERAL INFORMATION

StarCellBio Resources

To provide feedback or report software bugs, select ✉ **Contact** at the top of each page.

The reference material on experimental design and the experimental techniques in the program can be accessed by selecting **Reference Library** at the top of each page. Additionally, the same reference material can be accessed by clicking the **Learn More** buttons on the StarCellBio home page.

The StarCellBio user guide can be accessed by selecting 📘 **User Guide** at the top of each page.

Back to top

StarCellBio Navigation

The Navigation Tool Bar appears at the top of each page. To navigate through the program, select the appropriate button within the green navigation tool bar.
Alternatively, you can navigate through the program using the blue buttons at the bottom of each page.

Back to top

StarCellBio Progress Bar

A progress bar, which indicates all of the steps of an experiment and your progress within each experiment, appears on each page of a particular experiment.

Back to top

Saving

Your work will be automatically saved for you. Each time you sign in you will be able to access all of your previously started experiments.

Back to top

ASSIGNMENTS OVERVIEW PAGE

All of the assignments for a particular course are listed in the Assignments window.
To view the abstract of each assignment, select the assignment in the Assignments window. The abstract will be shown in the right panel.
To view the complete assignment, select **VIEW ASSIGNMENT**.
To navigate directly to previously started experiments, select the appropriate experiment underneath the assignment in the Assignments window.
To start a new experiment, without viewing the complete assignment, select **+ New Experiment** underneath the assignment in the Assignments window.

Back to top

DETAILED ASSIGNMENT PAGE

The complete assignment is shown on this page.
Once you have read the assignment, select **DESIGN EXPERIMENT** to start a new experiment.
Alternatively, to start a new experiment, select **+ New Experiment** in the Assignments window.
To navigate directly to previously started experiments, select the appropriate experiment in the Assignments window.

Back to top

EXPERIMENTAL DESIGN PAGE

To rename the experiment, click inside the Experiment Name box and type the new name.
To help in the experimental design, type in the objective that your experiment will address, your hypothesis for the experiment and think about the experimental technique that is best suited for your experiment.
Once you have designed your experiment, select **SET-UP EXPERIMENT**.

Back to top

EXPERIMENTAL SET UP PAGE

To get started, select **Create new set up** or select the appropriate experiment set-up from the **Select pre-existing set up as a template** dropdown menu.
Each treatment protocol represents a row in the Experimental Set Up table.
Select the strain, treatment(s), treatment concentration, the start time and duration of each treatment, temperature (if relevant) and the collection time.
The first two rows of the experiment set-up table are specifically for your positive and negative control samples, respectively. If you do not have one of these controls, leave the row blank. The experimental samples, other than your controls, will start in the 3rd row of the table.
Once you finish setting up your experiment, select **RUN EXPERIMENT**. Carefully review the summary of your experimental set-up and then either select **EDIT SET-UP** to go back to edit your set-up or select **CONFIRM SET-UP AND SELECT TECHNIQUE** to run your experiment. After you confirm your experiment set-up, you will be unable to change your treatment protocols for this particular experiment.

Additional Instructions:

- To add more than one treatment to a treatment protocol, fill in the grayed-out treatment, concentration, start and duration dropdown menus that appear as you edit a treatment protocol.
- To duplicate a particular treatment protocol, click on the copy icon on the right side of the row. You can then edit the duplicated treatment protocol as needed.
- To delete a particular treatment protocol, click on the trash can icon on the right side of the row.
- Some experiment set-up tables have an **Add Multiple Rows** button. This button enables the user to add multiple treatment protocols to the Set-Up table at a time by altering only one variable, such as treatment concentration, at a time.

Back to top

SELECT TECHNIQUE(S) PAGE

- To start a new Western Blot, Flow Cytometry, or Microscopy Experiment, select the **NEW WESTERN BLOT**, **NEW FLOW CYTOMETRY**, or **NEW MICROSCOPY** button, respectively. Please note that some assignments will only have certain experimental techniques available to use.
- To view or finish a previously started experimental technique, select the experimental technique name in the appropriate window. The program will navigate to the last edited page for the previously started technique.

Back to top

WESTERN BLOTTING EXPERIMENTAL TECHNIQUE PAGES

General Navigation

- Each Western Blot, using samples generated in the current experiment, is displayed in a tab directly underneath the Navigation Tool Bar.
- To add a new Western Blot experimental technique, either select the **+** tab or select **TECHNIQUES** within the Navigation Tool Bar.
- To delete a Western Blot experimental technique, select the **x** within the appropriate tab.
- There are 7 steps to complete each Western Blotting technique. The progress through the steps is illustrated at the top of each tab.

Back to top

Sample Preparation

Select the samples that you would like to prepare lysates for your western blot by selecting the checkbox to the left of each sample.
For each sample selected, select the appropriate lysate type from the **Lysate Type** dropdown menu.
To select more than one lysate type for each sample, select additional lysate types in the grayed-out **Lysate Type** dropdown menu.
If you inadvertently add more than one lysate type and would like to remove it, select the **Delete** checkbox to the right of each lysate type.
Once you finish selecting your samples, select **PREPARE LYSATES**.

Additional Information:

Each Western blot gel has 15 lanes. 14 lanes are available for samples and one lane must be reserved for the protein marker.
You can only select samples from the current experiment. To select samples from a different experiment, select **ASSIGNMENT 3** (or the appropriate assignment name) in the Navigation Tool Bar to navigate to the Detailed Assignment page. Select the appropriate experiment from the list on the left hand side.

Back to top

Prepare Gel

Select the appropriate percentage of polyacrylamide that you would like to use for your Western blot gel.

Back to top

Load Gel

All of the samples that you previously prepared will be automatically loaded in your gel. Each well in the gel that contains a sample will be blue.
To re-order the samples on your gel, drag and drop the samples into the correct order in the **Samples** window.
To load the protein marker, select the **LOAD MARKER** button. The marker will always be loaded in well #15 on the right side of the gel.
Once you prepare and load your gel, select **RUN GEL & TRANSFER**. Once **RUN GEL & TRANSFER** is selected, the samples and order of samples cannot be altered.

Back to top

Run Gel

A brief animation of the gel running, which is visualized by the dye front migrating through your gel, will run once you select **RUN GEL & TRANSFER**.

Back to top

Transfer

A brief animation of your gel as the proteins are transferred from the gel to the membrane will appear once you select **RUN GEL & TRANSFER**.

Back to top

Blot

Select the appropriate primary antibody from the **Primary Antibody** dropdown menu.
Select the appropriate secondary antibody from the **Secondary Antibody** dropdown menu.
Ensure that you select an appropriate secondary antibody that will recognize the primary antibody.
Once you select your blotting conditions, select **BLOT & DEVELOP**.

Back to top

Develop

A simulated western blot film is generated. As a reference, the protein sizes (in kiloDaltons or kDa) corresponding to each of the bands within lane #15 are shown to the right of the blot.
To increase the length of exposure of the western blot, move the **Exposure Time** slider to the right.
To decrease the length of exposure of the western blot, move the **Exposure Time** slider to the left.
To aid in determining the size of the proteins in the bands on your western blot, hover your cursor over the western blot. A horizontal red line will appear and indicate the exact molecular weight (in kDa).
To re-probe your membrane with antibodies that recognize another protein, select **RE-PROBE**. An additional tab labeled **Blot** will be generated. The user will then be able to select the appropriate blotting conditions to re-probe the blot.

Note: Remember to re-probe each western blot with a protein that serves as a loading control.

Back to top