ROCK IMAGER Manuals:
Plates Loading/Unloading and Imaging Procedure

Version 2017.9
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General Information

The computer and the software
The ROCK IMAGER Hotel/Imager and its controlling computer are located in the Crystallisation Robotics Room (room 1.81). Loading of the plates into the Hotel/Imager database as well as the barcode label printing are done on the ROCK IMAGER controlling computer, (metis.bioc.cam.ac.uk). The database management software is called Rock Maker, whereas the imaging software is called Rock Imager.

The rules of usage:
1) If you haven’t used the Imager/Hotel before, please contact Dr Paul Brear (pdb47@cam.ac.uk) who will provide the training and will create an account for you in the Hotel/Imager software.
   DO NOT use OTHER USERS’ ACCOUNTS to setup the plates!

2) DO NOT put any USB devices (flash cards, disk drives, etc.) into the FORMULATRIX computer USB slot.

3) DO NOT USE the FORMULATRIX computer FOR ANY TYPES OF INTERNET ACTIVITIES, i.e. internet browsing, e-mail checking, etc.

4) DO NOT MODIFY ANY COMPUTER’S SETTINGS.

5) DO NOT CLOSE the Rock Imager software !!!

Temperature settings:
The temperature inside the hotel is set to 19°C. The hotel cannot control the temperature of individual plates.

Automatic Imaging Schedule:
The plates are imaged immediately after loading into the hotel then at night according to this table of days, using the so-called Fibonacci sequence numbers. The UV-light imaging will take place at days 8 and 24.
Plates loading and imaging procedure

**Step 1: Access the computer**

a) Go to the FORMULATRIX controlling computer.

b) Wake up the LCD monitor by moving the mouse or by pressing spacebar.

c) Type the security password to unlock the screensaver. Please note that this is **not your user account password**, the security password can be obtained from Dr Paul Brear.

**Step 2: Launch the Rock Maker**

Launch **Rock Maker** software by clicking its icon in the Windows Taskbar in the lower left corner.

**Step 3: Login into the Rock Maker**

Complete the login credentials into the **Login** window and click **OK**.
Step 4: Create database entries for the Project and the Protein

a) Expand the folder trees of Screen and Projects in the Explorer window of the Rock Maker as shown on the figure, i.e. click the triangle signs next to the corresponding folders.

b) Right mouse click on the folder with your USERID and select New Project.

c) Type a name for your project, for example “Initial Screening”, then press Enter on the keyboard.

d) Right mouse click on the newly created project and select New Protein Formulation.

e) Type a name for your protein, for example “ABC”, then press Enter on the keyboard.
**Note:** You may add more information about your protein into the **Notes** section on the right hand-side of the window or to the ingredients section below by right clicking and adding an ingredient. Press Ctrl + S after you’ve added any information into the **Notes** section.

1) **Protein details here**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Name</th>
<th>ID</th>
<th>Lot</th>
<th>Mol. Wt (Da)</th>
<th>Conc. (mg/ml)</th>
<th>Conc. (μg/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>protein_a</td>
<td>811</td>
<td></td>
<td>1.98E+06</td>
<td>18.3</td>
<td>0.00016958</td>
</tr>
<tr>
<td><strong>Buffer</strong></td>
<td>buffer_b</td>
<td>427</td>
<td>2036</td>
<td>0.12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2) **Or protein details and buffer components can go here**
Step 5: Creating your experiment
There are 2 methods to create your crystallization plate.

**Method 1** - Screening Experiment, Ideal for generation of multiple commercially available screening plates (best method)

**Method 2** - Create experiment, slower method for individual or self-made plates

a) Screening Wizard

*Note* - It often takes a while to move on when you click Next. Click once and wait

a) Select Screen experiment from the top menu and follow the wizard through

b) Select (A) unless you are repeating a previously saved screen in which case select (B).

Select the appropriate plate type, as default it will show the correct plates supplied by the facility. Then click Next.

c) Select the screens that have been used by selecting the supplier (A) then the screen (B) and adding to the selected screen panel (C), before click Next (D).
d) Select the correct protein (A) then add to drop 1 (B) and repeat for drop 2. Alter the drop volume if necessary C. click Next

e) Select Fibonacci Nightly from the schedule menu. Click next

f) Add a prefix (eg protein name) (A) and add date to the file name (B) then click Next

g) Click print Bar code (A) and attach barcodes to plate (see section 8). If you are going to run the same screen again with eg different protein then Save (B) the setup to speed up set up next time.
b) Create Experiment

Slower method for individual self-made plates

a) Right mouse click on the newly created project and select New Experiment.

b) Type a name for the experiment, we recommend using the name of the screening kit you are going to use, e.g. “Classics Suite I”, then press Enter on the keyboard.

Note: You may add more information about your experiment into the Experiment Notes section on the right hand-side of the window. Press Ctrl + S after you've added any information into the Experiment Notes section

c) Select the correct Plate Type. At the moment the hotel can operate with two types of plates: “96 Well MRC 2 drop” and “24 Well Inteplate 4 drop”.

The pre-dispensed plates supplied by the Facility are “96 Well MRC 2 drop” type.

DO NOT USE ANYTHING OTHER THAN THE “96 Well MRC 2 drop”, “24 Well Intelliplate 4 drop” or “SWISSCI/MRC 3 drop” (Xchem screening) PLATES !!!

Consult Dr Paul brear (pdb47@cam.ac.uk) if unsure.
d) Fill out the reservoir with the screening kit formulation

i) Click the Canvas tab located at the bottom of the Experiment Info section.

ii) Left mouse click on the screen kit entry, i.e. Classics Suite I, hold the mouse button and drag the entry into the reservoir box (highlighted by yellow box) on the Canvas screen, release the mouse button. The Canvas will be then completed with the screening kit formulation.

*Note: for the JSCG+ screen use JCSG+ HTS screen form Molecular Dimensions*
e) Fill out the sample wells with the protein

i) Left mouse click on your protein entry, hold the mouse button and drag the entry into the left hand-side sample well (just above the highlighted yellow box), release the mouse button.

ii) Repeat the procedure with the right hand-side sample well.

**Note:** Make sure that both sample wells have been filled out, i.e. the colour of the sample well boxes should change to light/dark green. The imager will not take the images of empty wells.
Step 6: Print and stick the barcode label to the plate
Press Ctrl + S on the keyboard to save your experiment. The barcode label will then appear beneath the experiment, for example 1,402,90b2 (see figure).

Right mouse click on the barcode label and select Print Barcode.

d) Peel off the printed barcode label strip off the paper and stick it to the plate. Use the side of the plate that does not have the chamfers (i.e. cuts at 45 degrees angle). Make sure that the label is straight and that it is not wrapped around either of the corners of the plate.

Note: If you have more plates to load then go to Step 5 and repeat the Steps 5-8. Once all barcodes have been printed and fixed to the plates continue to the next step.
Step 7: Load the plate into the Hotel/Imager

a) Open the **Load Port** door; turn the black knob counterclockwise and swing the door open.

b) Place the plate/plates into the loading rack, you can choose any place. Keep the plate with the **BARCODE LABEL FACING AWAY FROM YOU!**
   Be careful, hold the plate tightly as the plates’ loading spaces in the rack are recessed and the plate can drop down suddenly.

c) Close the **Load Port** door and turn the black knob clockwise to lock the door.
Step 10: Store and image the plate

a) Close the Rock Maker software by clicking File then Exit.

b) Maximise the Rock Imager window by clicking its button in the Windows Taskbar, i.e.

c) In the Rock Imager window click Load Port then Store Contents. Your plate’s barcode will be scanned, picked up by the Hotel/Imager, moved to its final storing location, it will then be imaged according to the preset schedule.

Step 11: Finishing off

Minimise (DO NOT CLOSE) the software !!! DO NOT logout or switch off the computer.

Note: If you have any question regarding the above procedure or any other questions regarding the Hotel/Imager, please contact Dr Dima Chirgadze (dyc21@cam.ac.uk)
Online access for checking and scoring the images

The images from the crystallisation trials can be viewed online via RockMakerWeb using a web browser. The address is [http://metis.bioc.cam.ac.uk/RockMackerWeb/](http://metis.bioc.cam.ac.uk/RockMackerWeb/). The link is also available on the Crystallographic X-ray Facility website at [http://www.xray.bioc.cam.ac.uk](http://www.xray.bioc.cam.ac.uk/).

**Note** The manual describes the older version of RockMakerWeb which can be accessible here [http://metis.bioc.cam.ac.uk/RockMackerWeb/Login.aspx](http://metis.bioc.cam.ac.uk/RockMackerWeb/Login.aspx). The link is also available in the “Quick Links section” on the Facility Website.

**Step 1: Access the Rock Maker Web**

a) Go to the Rock Maker Web, i.e. [http://metis.bioc.cam.ac.uk/RockMackerWeb/](http://metis.bioc.cam.ac.uk/RockMackerWeb/)

b) Enter your USERID and the PASSWORD and click Login button.

c) Expand the Projects folder tree until you’ll see the barcode label entry for the desired crystallisation plate.
Step 2: Looking through the images: Plate View

List the well’s crystallisation condition formulation. Note: If you do have a crystallisation hit, double check the condition formulation!!!

Scoring tab

Click to view individual drop

Switch to a different imaging date

UV images

Change the drop
Step 3: Looking through the images

Allows imaging of all interesting drops (see page 27)

Change to Yes
Plates unloading procedure

**Step 1: Access the computer**
a) Go to the FORMULATRIX controlling computer.

b) Move the mouse or press spacebar key on the keyboard to wake up the screen.

c) Type the security password to unlock the screensaver. Please note that this is **not your user account password**, the security password can be obtained from Dr Paul Brear.

**Step 2: Go to the Rock Imager software**
Maximise the **Rock Imager** window by clicking its button in the Windows Taskbar, i.e.

**Step 3: Search for the plates to be unloaded**
a) Left mouse click on the **Search** tab in the left bottom corner of the Rock Imager window.
b) Search for the plates that you wish to unload. Use either the User name or Project search fields to type your search query. Press ENTER on the keyboard to complete the search.

Step 3: Move plates to the Load Port racks

a) Highlight the plate you wish to unload by left mouse clicking on the entry. For multiple selection press and hold left SHIFT on the keyboard while clicking onto the plates’ entries.

b) Right mouse click on the highlighted plate/plates, in the menu go to Move Plates to and click Load Port Hotel. The imager/hotel will start transporting the plates into the Load Port racks.
Step 3: Remove the plates from the Load Port racks

IMPORTANT!
WAIT UNTILL ALL THE PLATES HAVE BEEN TRANSPORTED TO THE LOAD PORT RACKS!

a) Open the Load Port door; turn the black knob counterclockwise and swing the door open.

b) Remove the plates from the Load Port racks.

c) Close the Load Port door and turn the black knob clockwise to lock the door.

Step 11: Finishing off

a) Left mouse click on the Load Port tab in the left bottom corner of the Rock Imager window.

b) Minimise (DO NOT CLOSE) the Rock Imager software !!! DO NOT logout or switch off the computer.

Note: If you have any question regarding the above procedure or any other questions regarding the Hotel/Imager, please contact Dr Paul brear (pdb47@cam.ac.uk)
Procedure for forcing the unscheduled VIS and UV imaging of the plates

Step 1: Access the computer
a) Go to the FORMULATRIX controlling computer.
b) Move the mouse or press spacebar key on the keyboard to wake up the screen.
c) Type the security password to unlock the screensaver. Please note that this is \textit{not} your user account password, the security password can be obtained from Dr Paul Brear.

Step 2: Go to the Rock Imager software
Maximize the \textbf{Rock Imager} window by clicking its button in the Windows XP taskbar, i.e.

Step 3: Search for the plates to be unloaded
a) Left mouse click on the \textbf{Plates} tab at the top of the Rock Imager window then the \textbf{Search} tab in the bottom left corner of the Rock Imager window.
b) Search for the plates that you wish to image. Use either \textbf{User name} or \textbf{Project} or \textbf{Plate ID} search fields to type your search query. Press ENTER on the keyboard to complete the search.

Step 3: Force the unscheduled imaging
a) Highlight the plate you wish to image by left mouse clicking on the entry. For multiple selection press and hold left \textbf{SHIFT} on the keyboard while clicking onto the plates’ entries.
b) Right mouse click on the highlighted plate/plates, in the menu select \textbf{Image Plate Using} option
c) In the “Select Imaging Settings” window select “UV - Very High” and click the \textbf{OK} button
Optional: Imaging Interesting drops only

You may ask the Formulatrix to image only the drops that you have marked as interesting (by pressing “i” while doing manual scoring, see page 15). To do this just right mouse click on the highlighted plate/plates and the menu select Image Interesting Drop(s) Using… and then select whatever the capture profile you require, i.e. Imager defaults or UV-very high.

Step 4: Finishing off

a) Left mouse click on the Load Port tab in the left bottom corner of the Rock Imager window.

b) Minimise (DO NOT CLOSE) the Rock Imager software!!!
DO NOT logout or switch off the computer.

Note: If you have any question regarding the above procedure or any other questions regarding the Hotel/Imager, please contact Dr Paul brear (pdp47@cam.ac.uk)