**Create Component**

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| --- | --- |
| **Actions Performed by User** | **Responses from the System** |
| 1. Enter Name, 2. Enter Molecule Details, 3. Enter Concentration. |  |
| 1. User saves component. |  |
|  | 1. System checks data and either confirms component by showing component ID - or highlights field in error with explanatory text. |

**Search, View, Copy, Update, Delete Components**

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| --- | --- |
| **Actions Performed by User** | **Responses from the System** |
| 1. User enters ID, Name or Molecule. |  |
|  | 1. System shows matching components. |
| 1. User chooses to copy component (Option). |  |
|  | 1. System adds new component with same data except that a) name field is appended with (copy) and b) component ID is new. |
| 1. User chooses to delete component (Option). (This option is only available if the component has not been used in an experiment). |  |
|  | 1. System deletes the component. |
| 1. User chooses to update component (Option). (This option is only available if the component has not been used in an experiment). |  |
|  | 1. System takes user to the component detail screen that allows user to change details. |
| 1. User chooses to read component (Option). (This option is only available if the component has not been used in an experiment). |  |
|  | 1. System takes user to the component detail screen in read only mode. |

**Create Master Formula**

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| --- | --- |
| **Actions Performed by User** | **Responses from the System** |
| 1. Enter Formula Name. |  |
| 1. Search Component by ID, Name or Molecule. |  |
|  | 1. System shows matching components. |
| 1. Add Component to Formula. |  |
| 1. Enter units of component(s) (this can be any scale - as it will be normalised when saved). |  |
| 1. Repeat 2-5 (Option). |  |
| 1. Save Formula. |  |
|  | 1. System checks data and either confirms formula by showing ID and updating the ratio fields - or highlights field in error with explanatory text. |

**Search, View, Copy, Update, Delete Formulae**

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| --- | --- |
| **Actions Performed by User** | **Responses from the System** |
| 1. User enters ID or Name. |  |
|  | 1. System shows matching formulae. |
| 1. User chooses to copy formula. |  |
|  | 1. System adds new formula with same data except that a) name field is appended with (copy) and b) formula ID is new |
| 1. User chooses to delete formula. (This option is only available if the formula has not been used in an experiment). |  |
|  | 1. System deletes the formula. |
| 1. User chooses to update formula. (This option is only available if the formula has not been used in an experiment). |  |
|  | 1. System takes user to the formula detail screen that allows user to change details. |
| 1. User chooses to read formula. |  |
|  | 1. System takes user to the formula detail screen in read only mode. |

**Create Plate**

|  |  |
| --- | --- |
| **Actions Performed by User** | **Responses from the System** |
| 1. Enter Name, Enter No or rows, Enter No of columns, Enter Plate Width, Enter Plate Length, Enter Width Offset to first Well, Enter Length Offset to first Well, Enter Well Width, Enter Well Length, Enter Minimum Well Volume, Enter Maximum Well Volume. |  |
| 1. Save Plate. |  |
|  | 1. System checks data and either confirms plate by displaying the ID and showing a diagram of plate - or highlights field in error with explanatory text. |

**Search, View, Copy, Update, Delete Plates**

|  |  |
| --- | --- |
| **Actions Performed by User** | **Responses from the System** |
| 1. User enters ID, Name or number of wells. |  |
|  | 1. System shows matching plates. |
| 1. User chooses to copy plate (Option). |  |
|  | 1. System adds new plate with same data except that a) name field is appended with (copy) and b) plate ID is new. |
| 1. User chooses to delete plate (Option). (This option is only available if the plate has been used in an experiment). |  |
|  | 1. System deletes the plate. |
| 1. User chooses to update plate (Option). (This option is only available if the plate has been used in an experiment). |  |
|  | 1. System takes user to the plate detail screen that allows user to change details. |
| 1. User chooses to view plate (Option). |  |
|  | 1. System takes user to the plate detail screen in read only mode. |

**Create Experiment**

|  |  |
| --- | --- |
| **Actions Performed by User** | **Responses from the System** |
| 1. Enter Experiment Name. |  |
| 1. Search Plate by ID, Name or Number of wells. |  |
|  | 1. System shows matching plates. |
| 1. Select Plate. |  |
| 1. Enter sample volume. |  |
|  | 1. System checks volume is between minimum and maximum values for plate. If volume is outside range then error is shown. |
| 1. Search LiquidHandler by Name. |  |
|  | 1. System shows matching Liquidhandlers. |
| 1. Select LiquidHandler. (User can also select manual). |  |
| 1. Search TemperatureCycler by Name. |  |
|  | 1. System shows matching TemperatureCyclers. |
| 1. Select TemperatureCycler. (User can also select manual). |  |
| 1. Search Formula by ID or Name. |  |
|  | 1. System shows matching formulae. |
| 1. Select Formula. |  |
| 1. Search Heat Cycle by ID or Name. |  |
|  | 1. System shows matching heat cycles. |
| 1. Select Heat Cycle. |  |
|  | 1. System updates to show that experiment is now saveable. |
| 1. Select Single Cell (Option). |  |
|  | 1. System shows formula ratios and temperature cycle data. |
| 1. Change formula ratios or temperature parameters in single cell. |  |
| 1. Save Changes. |  |
|  | 1. System checks data. If data is OK then changes are saved and graphic shows that cell is different from master. |
| 1. Select Range of Cells (Option) (Only Default Formula Cells are selectable). |  |
|  | 1. System shows formula ratios and temperature cycle data at start and end of selection. |
| 1. Change formula ratios or temperature parameters in either start or end. |  |
| 1. Save Changes. |  |
|  | 1. System checks data. If data is OK then range change is distributed across selection. Changes are saved and graphic shows that cells are different from master. |

**Search, View, Copy, Update, Delete Experiments**

|  |  |
| --- | --- |
| **Actions Performed by User** | **Responses from the System** |
| 1. User enters ID or Name. |  |
|  | 1. System shows matching Experiments. |
| 1. User chooses to copy experiment (Option). |  |
|  | 1. System adds new experiment with same data except that a) name field is appended with (copy) and b) experiment ID is new. |
| 1. User chooses to delete experiment. (This option is only available if the experiment has not been started). |  |
|  | 1. System deletes the experiment. |
| 1. User chooses to update experiment. (This option is only available if the experiment has not been started). |  |
|  | 1. System takes user to the experiment detail screen that allows user to change details. |
| 1. User chooses to view experiment. |  |
|  | 1. System takes user to the experiment detail screen in read only mode. If the experiment is started or complete then actual values from dispensing and annealing stages are shown. |

**Run Experiment**

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| --- | --- |
| **Actions Performed by User** | **Responses from the System** |
| 1. User enters Experiment ID or Name. |  |
|  | 1. System shows matching Experiments. |
| 1. User Starts Experiment (Option). Only experiments that have not yet been started have this option). |  |
|  | 1. System checks liquid handler option that has been chosen. If manual - then instructions are given and steps shown to the user. If machine then instructions are given to switch on and connect. |
| 1. Manual pipetting (Option). User follows instructions to manually pipette. And confirms when finished. |  |
|  | 1. If machine based, then System asks user to enter additional set up required. For example placement of plate and reservoirs. |
| 1. System enters liquid handler set up info. (This might be third party - still debating). |  |
|  | 1. If machine based, then System asks user to place empty plate in LiquidHandler. |
|  | 1. System checks that LiquidHandler connection is up. If connection is down it informs the user and experiment is not started. If connection valid then dispensing starts. |
| 1. User can monitor progress while dispensing. |  |
|  | 1. During dispensing progress is updated on system and actual volumes are recorded. When dispensing completed, the system updates the status of the experiment. Informs user via text or other that dispensing is done. |
| 1. When dispensing finished successfully, user moves plate to temperature cycler (or simply plugs in combined plate/annealer). User tells system that it is ready for temperature cycling. |  |
|  | 1. Instructions are given to switch on and connect. System checks that temperature cycler connection is up. If connection is down it informs the user and experiment is not started. If connection valid then annealing starts. |
| 1. User can check progress during annealing. |  |
|  | 1. During annealing actual temp values are recorded. When temperature cycler completes, the system updates the status of the experiment. Informs user via text or other that annealing is done. |
| 1. User removes plate and stores it securely. |  |

**Create Imaging Setup**

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| **Actions Performed by User** | **Responses from the System** |
| 1. Enter Imaging Setup Name. |  |
| 1. Search xyz stage by Name. |  |
|  | 1. System shows matching stages. |
| 1. Select xyz stage. |  |
| 1. Search objective by Name. |  |
|  | 1. System shows matching objectives. |
| 1. Select objective. |  |
| 1. Search camera by name. |  |
|  | 1. System shows matching cameras. |
| 1. Select camera. |  |
| 1. Enter light source |  |
| 1. Save Imaging Setup. |  |
|  | 1. System checks data and either confirms Imaging Setup by displaying an ID or highlights field in error with explanatory text. |

**Search, View, Copy, Update, Delete Imaging Setups**

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| --- | --- |
| **Actions Performed by User** | **Responses from the System** |
| 1. User enters ID, Name, Camera etc. |  |
|  | 1. System shows matching Imaging Setups. |
| 1. User chooses to copy Imaging Setup (Option). |  |
|  | 1. System adds new Imaging Setup with same data except that a) name field is appended with (copy) and b) component ID is new. |
| 1. User chooses to delete Imaging Setup (Option). (This option is only available if the Imaging Setup has not been used in a result set. If it has been used, then option is given to archive it. Archived setups will still appear in lists but will no longer be selectable). |  |
|  | 1. System deletes the Imaging Setup. |
| 1. User chooses to update Imaging Setup (Option). (This option is only available if the Imaging Setup has not been used in a result set). |  |
|  | 1. System takes user to the Imaging Setup detail screen that allows user to change details. |
| 1. User chooses to read Imaging Setup (Option). (This option is only available if the component has not been used in a result set). |  |
|  | 1. System takes user to the Imaging Setup detail screen in read only mode. |

**Run Result Auto-capture**

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| **Actions Performed by User** | **Responses from the System** |
| 1. Search experiment by ID or Name. |  |
|  | 1. System shows matching experiments. (Only those that have successfully completed dispensing and annealing) |
| 1. Select experiment. |  |
| 1. Search Imaging Setup by ID, Name, Objective, Stage |  |
|  | 1. System shows matching Imaging Setups. |
| 1. Select Imaging Setup. |  |
| 1. Set various imaging details - either “auto” or specifying digital, analog gain and frame rate. |  |
|  | 1. System shows matching cameras. |
|  |  |
|  | 1. System checks data and either confirms Imaging Setup by displaying an ID or highlights field in error with explanatory text. |

**Review Result Set**

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| --- | --- |
| **Actions Performed by User** | **Responses from the System** |
| 1. Search result set by date, ID, experiment etc. |  |
|  | 1. System shows matching results. |
| 1. Select result set. |  |
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| **Business Rules** |
| Components are Materials in buffer at a specified concentration |
| A formula is one or more components in a defined ratio |
| A plate can contain one or more wells |
| Each well has a location relative to the plate and a minimum and maximum volume |
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| Plate and temperature cyclers need to be compatible |
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