

SIMS: Samples Inventory Management System

Version: 1.3.0

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1 System Overview

The Samples Inventory Management System (SIMS) is a Web-based platform for managing the life cycle of biological samples, mainly urine and blood, collected as part of multiple clinical studies in the field of nephrology. In our network of collaborating institutions, personnel collect samples, store them in freezers, and deliver them to other laboratories as needed. We designed SIMS to track and monitor this multifaceted process. The system supports multiple simultaneous users and provides the functionality to manage the following data categories.

1.1 Data Categories

- **Studies:** Samples are organized within studies or protocols. Each study undergoes several phases: the design phase when studies are created and their protocols (study sites, timepoints, and sample types) defined, the submission and approval phase, and the collection phase when patients are recruited and samples stored. Once the collection phase is over, the existing samples are analyzed until they have been exhausted.
 - **Study sites:** Each study has own or more individual sites.
 - **Timepoints:** Study timepoints denote when samples were collected. ex) baseline (pre-operative), Day 1, Day 3, etc.
 - **Samples:** Various properties of the biological samples (sample type, number of aliquots, quantity uL)
- **Patients:** Each patient listed in the system is part of one discrete study. Patient IDs (e.g.: CAR-01-0001) are automatically generated in SIMS by combining the two or three digit study ID and a hyphen, the two-digit study site ID, and a four-digits sequential auto-generated number. The same physical patient may be in more than one study, but this relationship is not stored in the system. Instead, an external system will be needed to track that relation between the SIDS study patient IDs and real patient identifiers. Thus, there is no PHI stored in SIMS.
- **Samples:** Upon creation of patient IDs, the system auto-generates sample-entry records for each protocol portion that is available for that patient (patient_id, timepoint, sampletype, status, status date, freezer location, shipping location, etc.) Depending on its destination, each sample will display a status (filled, consumed, shipped, etc.)
- **Freezers:** Samples are stored in freezers. The space in the freezers is subdivided into shelves, racks, and slots. A single slot is also referred to as a “freezer location” which can contain a box.
 - **Freezer locations:** Each box uses a coordinate system of Rows (A-J) and Columns (1-10). Additionally, each box contains samples from only one study.
- **Shipments:** SIDS also tracks shipments of samples to external collaborators and marks which samples have been shipped out. SIDS tracks dates, destination information, carriers, and tracking numbers. Each shipment is bound to a specific study and can consist of one or more boxes. Additionally, the specific location of each sample is recorded in the boxes, allowing a manifest to be generated and included with the shipment.

1.2 System Security

SIMS has a range of functionalities, which are allotted to different levels of users based on their need or lack thereof of certain information and capabilities. The functions from lower privilege users are always available to higher privilege users as well. The capabilities of users from low to high privilege are as follows:

- **Navigator**
 - Browse only. No changes can be made to the underlying data.
 - Generate reports.
- **Data Collector**
 - Collect samples for specified studies and scan into freezer locations.
 - Ship sample boxes for specified studies.
- **Study Administrator**
 - Create new studies.
 - Define study protocols (e.g. study sites, timepoints, timepoint samples).
 - Change study status.
 - Define patients and create sample barcodes.
 - Create shipping entries, change shipping status.
- **System Administrator**
 - User management: Generate users. Assign user roles.
 - Maintain shipping locations.
 - Create and edit freezer information.
 - Maintain general list of sample types used by the system.

1.3 Navigation / System Interaction

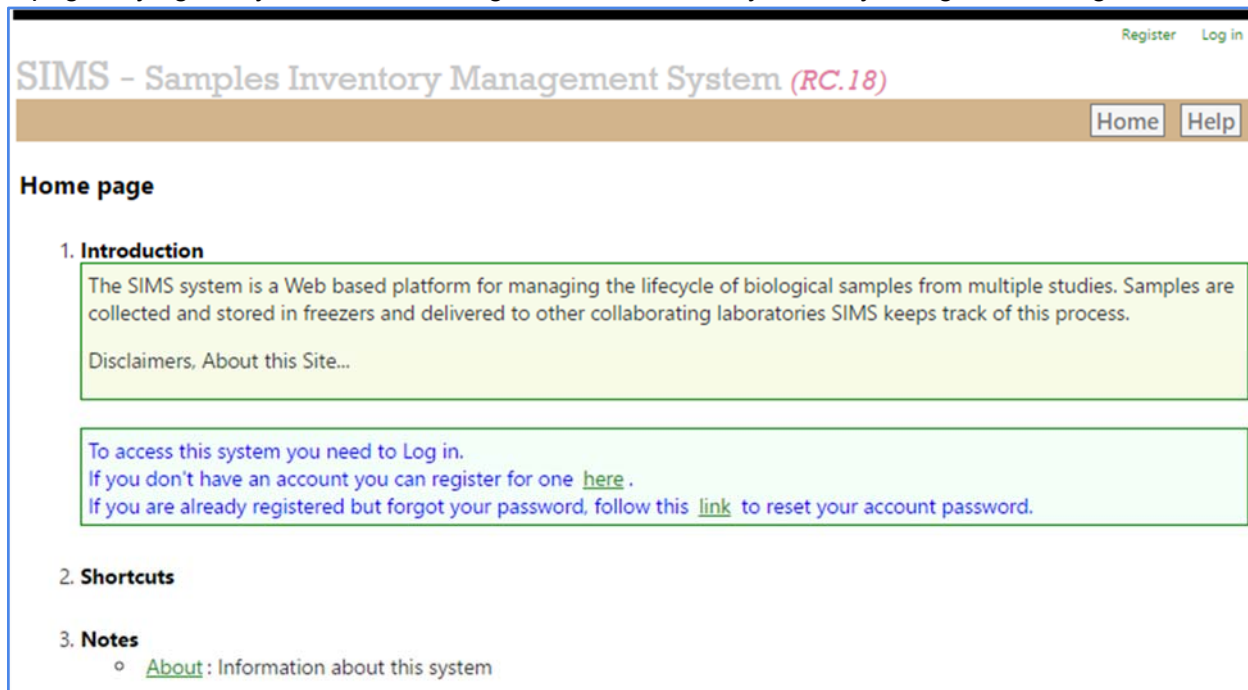
This section describes how to execute specific tasks in the system. These include connecting to the system, logging in, navigation, and management of the data categories supported by the system.

1.3.1 Account Creation and Home Page

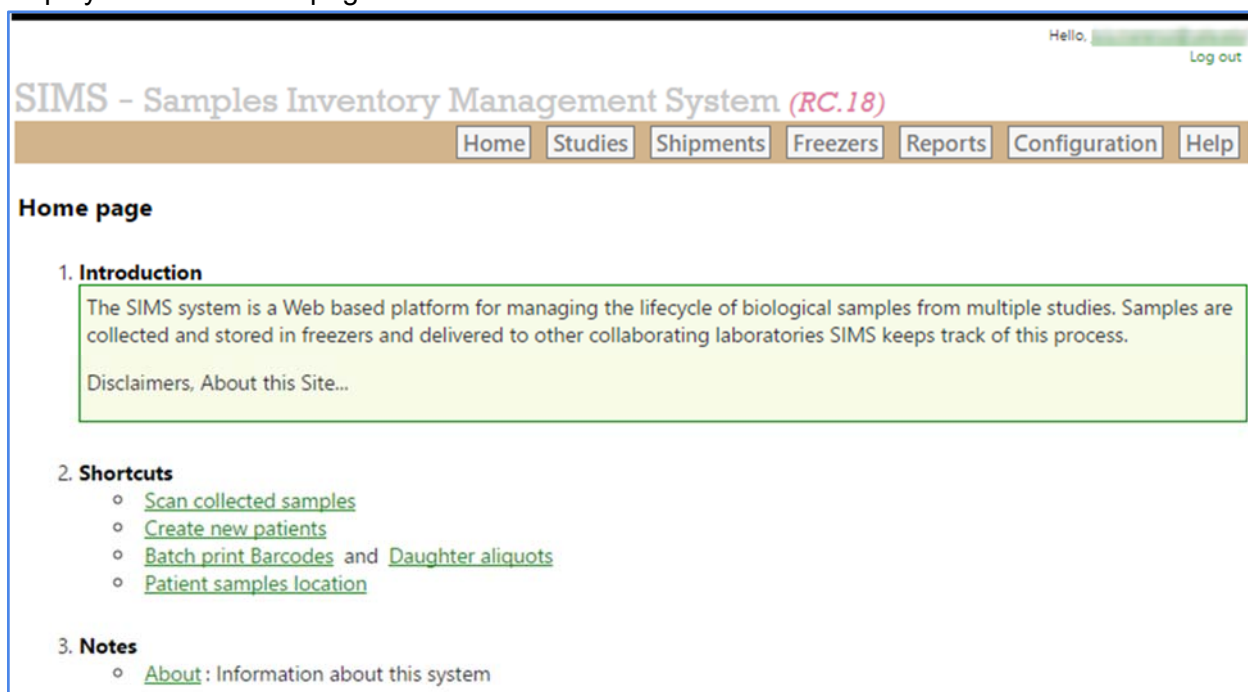
Users must create an account to interact with the SIMS system. If you do not have an account, go to “Log in” on the far top-right, and select, “Don’t have an account”. Enter an email address and password. You will receive a confirmation link. You must be in the Yale network to be able to access SIDS.

Once you have your account, you must contact the system administrator for assigning your rights to access the system.

Note: the system will automatically log out users following periods of inactivity. If you encounter a page saying that you do not have rights to access the system, try to log out and log back in.



The main menu bar is populated with options to interact with studies, shipments, freezers, reports, configuration, and a link to help pages. General information about the system is displayed on the home page.



1.3.2 Main Menu

The main menu is a tan-colored bar which allows quick access to functionalities within the system. This menu is presented below in two forms. Before:



and after a successful log-in:

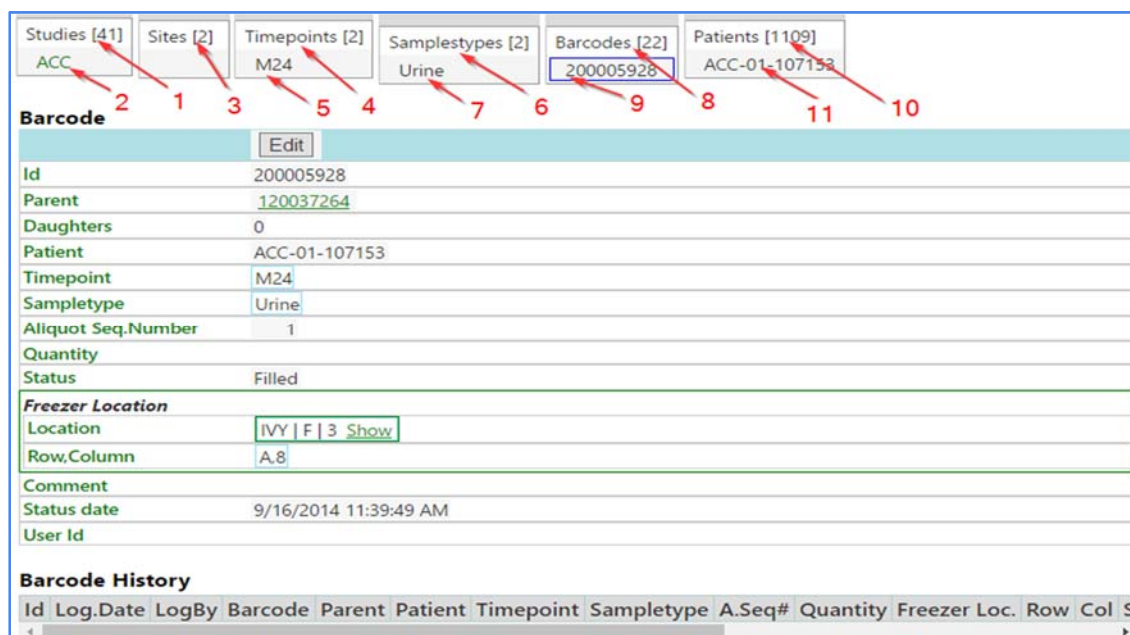


1.3.3 Hierarchical BreadCrumbs Menu

When certain options (e.g. studies, shipments, and freezers) are selected, a hierarchical breadcrumbs menu is displayed just below the main menu. This menu informs the user of where exactly in the interaction with the system they are. It provides two layers: a top layer indicating a data class and a lower layer for a specific element within that class.

The following image shows a study's breadcrumb menu populated for a specific sample. On the page shown below, the user can easily jump with a single click to the studies (1), study details (ACC) (2), study sites (3), study timepoints (4), a specific study time point (5), samplestypes (6), a specific sample type (7), barcodes (8), a specific barcode (9), study patients (10), or a specific patient (11). The number enclosed in square brackets indicates the elements for the category, and a blue box is used to indicate the information selected and in display on the page (9).

Note that this menu displays boxes at varying **height-levels**. If a subsequent box is at a lower height than a previous one, that means that the information in the lower box is dependent upon the information in the higher box. For example, in the figure below Sampletypes [2] and Barcodes [22] are positioned below the box "Timepoints [2] / M24" indicating they are related to the Timepoint M24.



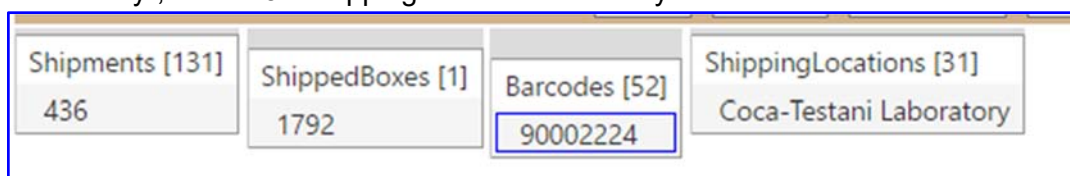
The screenshot shows a breadcrumb menu at the top with the following items and counts: Studies [41], Sites [2], Timepoints [2], Samplestypes [2], Barcodes [22], and Patients [1109]. Red arrows point to each item with numbers 1 through 11. Below the breadcrumbs is a form for a specific barcode. The form has a header "Barcode" with an "Edit" button. The form fields are: Id (200005928), Parent (120037264), Daughters (0), Patient (ACC-01-107153), Timepoint (M24), Sampletype (Urine), Aliquot Seq.Number (1), Quantity, Status (Filled), Freezer Location (IVY | F | 3 Show), Row.Column (A.8), Comment, Status date (9/16/2014 11:39:49 AM), and User Id. At the bottom is a "Barcode History" table with columns: Id, Log.Date, LogBy, Barcode, Parent, Patient, Timepoint, Sampletype, A.Seq#, Quantity, Freezer Loc., Row, Col, S.

Id	Log.Date	LogBy	Barcode	Parent	Patient	Timepoint	Sampletype	A.Seq#	Quantity	Freezer Loc.	Row	Col	S

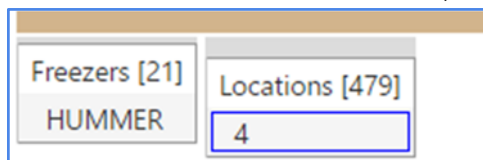
From the image above, we can tell that information is being displayed about patient barcode “2000005928” out of 22 barcodes, that are of sample type “Urine” (out of 2 possible sample types). This barcode is part of timepoint “M24” out of 2 timepoints, 2 possible sites, and study “ACC” out of 41 possible studies.

Note: Clicking on any of the boxes in the menu (ex. “Studies” or “Patients”) will bring you to a list of all the elements in that set. To see the other barcodes that belong to this patient (ACC-1-107513), click on the patient ID or “Barcodes [22].”

The shipments breadcrumbs menu below shows a specific barcode in the box. Note below that the selected barcode “90002224” is one of 52 barcodes in the shipped box 1792, and a total of 1 shipped boxes is part of Shipment 436. That shipment has shipping location “Coca-Testani Laboratory”, one of 31 Shipping Locations in the system.



The freezers breadcrumb menu below shows that the sample is in Location 4 out of 479 locations in the freezer HUMMER, which is one of 21 freezers in the system.



2 Studies

From the main menu, click on Studies to show the summary list of all studies in the system. Click on an ID to access study details.

Home Studies Shipments Freezers Reports Configuration Help						
Studies [41]	Sites	Timepoints	Sampletypes	Barcodes	Patients	
Studies List						New
Status	Id	Description	Sites	Timepoints	Patients	
Recruit	AAA		1	1	39	
Recruit	ACC	Accord, urines and serum from multiple analyses	2	2	1109	
Recruit	AIN	This is the second study arm for the proteomics protocol. HIC 1111009286. Arm 1 uses the acronym PRT; Arm 2 uses the acronym NOR.	2	1	241	
Recruit	APK	No patients collected	1	1	115	
Recruit	BBS	Batch Bias Study	1	1	15	
Recruit	BIF	Blood FeNA	1	37	101	
Recruit	BSH	Biomarker Sample Handling	3	4	181	
Recruit	CAR	TRIBE Cardiac Surgery Study	11	18	3200	
Recruit	CKM	???	1	1	1	
Recruit	CTR	Generating QC plasma samples from healthy Proteomics controls (fresh samples) and TRIBE Cardiac Patients (came back from McMasters)	2	1	4	
Recruit	DDC	Deceased Decease Study	5	20	1771	

2.1 Creating a New Study

Click on [New] to create a new study and enter the appropriate information.

Studies [41]	Sites	Timepoints	Sampletypes	Barcodes	Patients		
Study							
Adding ...		Update	Cancel				
Id	A11						
Description	Sample study						
Protocol number	1112223344						
Time units	Days						
Study Status	Design ▼						

2.2 Study Protocol

Then, when a study is given the “Design” status, we can proceed to make changes to the study protocol (sites, timepoints, and time point - sample types).

The screenshot shows the 'Study Protocol' interface. At the top, there are tabs for 'Studies [42]', 'Sites [0]', 'Timepoints [0]', 'Sampletypes', 'Barcodes [0]', and 'Patients [0]'. The 'Studies [42]' tab is active, showing a list of studies with 'A11' selected. Below this, the 'Study' section is displayed with fields for 'Id' (A11), 'Description' (Sample study), 'Protocol number' (1112223344), 'Time units' (Days), and 'Study Status' (Design). The 'Study Status' is highlighted in blue. Below the 'Study' section, there are three main sections: 'Sites', 'Timepoint / Sampletype (s)', and 'Freezers'. The 'Sites' section has a table with columns 'Prefix' and 'Description'. The 'Timepoint / Sampletype (s)' section has a table with columns 'SN', 'Timepoint', 'Name', 'Aliquots', 'Quantity', and 'Units'. The 'Freezers' section has a table with columns 'Freezer' and 'Patients'.

2.2.1 Study Sites

Select “sites” from the breadcrumbs menu, and click “New.”

The screenshot shows the 'Study Sites' interface. At the top, there are tabs for 'Studies [42]', 'Sites [0]', 'Timepoints [0]', 'Sampletypes', 'Barcodes [0]', and 'Patients [0]'. The 'Sites [0]' tab is active, showing a list of sites. Below this, the 'Study Sites' section is displayed with a 'New' button. The 'New' button is highlighted in blue. Below the 'New' button, there is a table with columns 'Site prefix' and 'Description'.

Enter the site information. Hit update. Repeat for other sites.

Note: site prefix is important as it will be used to generate patient IDs. Site prefixes should be unique within a study.

The screenshot shows the 'Study Sites' interface. At the top, there are tabs for 'Studies [42]', 'Sites [0]', 'Timepoints [0]', 'Sampletypes', 'Barcodes [0]', and 'Patients [0]'. The 'Sites [0]' tab is active, showing a list of sites. Below this, the 'Adding ...' section is displayed with 'Update' and 'Cancel' buttons. The 'Update' button is highlighted in blue. Below the 'Update' button, there is a table with columns 'Study', 'Site prefix', and 'Description'. The 'Study' field is set to 'A11', the 'Site prefix' field is set to '01', and the 'Description' field is set to 'New Haven'.

Studies [42] A11	Sites [2]	Timepoints [0]	Sample
---------------------	-----------	----------------	--------

Study Sites

Site prefix	Description
01	New Haven
02	Boston

Once finished with all study sites, proceed to the study timepoints at which samples are collected.

2.2.2 Timepoints

Click on “Timepoints” and select “New” to enter the new time point information.

Studies [42] A11	Sites [2]	Timepoints [0]	Sampletypes	Barcodes [0]	Patients [0]
---------------------	-----------	----------------	-------------	--------------	--------------

Adding ...

Id	0
Study	A11
Serial number	1
Timepoint	Day 1
Description	

Click “Update”.

Studies [42] A11	Sites [2]	Timepoints [1] Day 1	Sampletypes [0]	Barcodes [0]	Patients [0]
---------------------	-----------	-------------------------	-----------------	--------------	--------------

Id	337
Study	A11
Serial number	1
Timepoint	Day 1
Description	

Once the new time point has been generated, we can either continue generating more timepoints or add sample types to this timepoint.

2.2.3 Timepoint - Sample Types

After selecting a specific Timepoint, click on “Sampletypes,” and then “New.” The next form allows you to choose a sample type from the list available on the system, specify the number of aliquots to be collected, and the quantity of each. Barcodes are generated for the number of aliquots specified. **Note:** Sample types are linked to specific timepoints, so if you need Urine samples for Day 1, 2, and 3, you will need to add this sample type to the three timepoints separately.

If a needed sample type is not in the list, ask a system administrator to add it for you.

Studies [42] A11	Sites [2]	Timepoints [1] Day 1	Sampletypes [0]	Barcodes [0]	Patients [0]
Adding ...			Update	Cancel	
Timepoint			Day 1 ▾		
Sample type			Blood ▾		
Number of Aliquots			10		
Quantity (uL)			100		

Once a sample type is added, we can continue adding more for this specific time point.

Studies [42] A11	Sites [2]	Timepoints [1] Day 1	Sampletypes [1] Blood	Barcodes [0]	Patients [0]
			Add	Edit	Delete
Timepoint			Day 1		
Sample type			Blood		
Number of Aliquots			10		
Quantity (uL)			100		

In this case we added one more, “Urine.” When we click on “Sampletypes”, we can see the full list of sampletypes for this Timepoint.

Studies [42] A11	Sites [2]	Timepoints [2] Day 1	Sampletypes [2]	Barcodes [0]	Patients [0]
Study sampletype list			New		
Id	Name	Description	Aliquots	Quantity	Units
1	Blood		10	100	ml
20	Urine		10	100	ml

To add more timepoints, click on “Timepoints”, and then “New.” We repeated the same steps above for a Timepoint called Day 2.

Studies [42]	Sites [2]	Timepoints [2]	Samplestypes [2]	Barcodes [0]	Patients [0]
A11		Day 2			

Study sampletype list New

Id	Name	Description	Aliquots	Quantity	Units
1	Blood		10	50	ml
20	Urine		10	100	ml

While in design mode (when the study ID is red), we cannot add patients or scan barcodes. To do this, we need to click on the study to go to the study description page. This page shows the full protocol detail of the study, plus the number of patient samples located within specific freezers.

Studies [42]	Sites [2]	Timepoints [2]	Samplestypes	Barcodes [0]	Patients [0]
A11					

Study

Add Edit Delete

Id	A11
Description	Sample study
Protocol number	1112223344
Time units	Days
Study Status	Design

Sites		Timepoint / Sampletype (s)				Freezers	
Prefix	Description	SN	Timepoint	Name	Aliquots	Quantity	Units
01	New Haven						
02	Boston						
		1	Day 1				
				Blood	10	100	ml
				Urine	10	100	ml
		2	Day 2				
				Blood	10	50	ml
				Urine	10	100	ml

2.2.4 Changing Study Status

To do this, we click “Edit” to change the study status from “Design” to “Recruit.”

The screenshot shows a web application interface for managing studies. At the top, there are buttons for 'Studies [42]', 'Sites [2]', 'Timepoints [2]', 'Sampletypes', 'Barcodes [0]', and 'Patients [0]'. The 'Studies [42]' button is highlighted with a red border and contains the text 'A11'. Below this is the 'Study' section, which is currently in 'Editing ...' mode. It contains fields for 'Id' (A11), 'Description' (Sample study), 'Protocol number' (1112223344), 'Time units' (Days), and 'Study Status' (Design). A dropdown menu is open for the 'Study Status' field, showing options: 'Design', 'Recruit', and 'Locked'. The 'Recruit' option is highlighted with a blue background. To the right of the dropdown, there is a table for 'Sites' with columns 'Prefix' and 'Description'. It lists two sites: '01 New Haven' and '02 Boston'. Below the sites table is a table for 'Timepoints' with columns 'Day', 'Sampletype (s)', 'Aliquots', 'Quantity', and 'Units'. It lists two timepoints: 'Day 1' and 'Day 2'. Each timepoint has two sample types: 'Blood' and 'Urine'. The 'Recruit' status is indicated by a green background on the 'Study' section header.

Prefix	Description
01	New Haven
02	Boston

Day	Sampletype (s)	Aliquots	Quantity	Units
1	Day 1			
	Blood	10	100	ml
	Urine	10	100	ml
2	Day 2			
	Blood	10	50	ml
	Urine	10	100	ml

This new status will allow us to add patients. Notice how the study color changes to green.

The screenshot shows the same web application interface as before, but the 'Study Status' is now 'Recruit'. The 'Study' section header is green, and the 'Add', 'Edit', and 'Delete' buttons are visible. The 'Id' field is A11, the 'Description' is Sample study, the 'Protocol number' is 1112223344, and the 'Time units' are Days.

Prefix	Description
01	New Haven
02	Boston

Day	Sampletype (s)	Aliquots	Quantity	Units
1	Day 1			
	Blood	10	100	ml
	Urine	10	100	ml
2	Day 2			
	Blood	10	50	ml
	Urine	10	100	ml

2.3 Patients

For a selected study, click on patients. (The study must be in Recruit mode.) You will be presented with two options to add patients: “Add full protocol” and “Add selected.”

The screenshot shows a navigation bar with tabs: Studies [42] (containing 'A11'), Sites [2], Timepoints [2], Sampletypes, Barcodes [0], and Patients [0]. Below the tabs is a section titled 'Study Patients list' with a 'Search' button and two yellow buttons: 'Add full protocol' and 'Add Selected'. At the bottom, a table header is visible with columns: Id, Alternative Id, Barcodes, and Date added.

2.3.1 Adding Full Protocol Patients

“Add full protocol” will generate all barcodes for all timepoint-sample types combinations specified in the protocol. The next form will ask for the number of patients for each of the sites that were entered in the protocol. In this case, we add 5 and 3 for the sites New Haven and Boston, respectively. Then we click “Add”.

The screenshot shows the 'Patients & Barcode Generation' form. It has the same navigation bar as the previous screenshot. Below the tabs, the title 'Patients & Barcode Generation' is followed by the instruction 'Specify the number of patients per site'. A table is present with two columns: 'Site' and 'Patients'. The table contains two rows: '01 New Haven' with a value of '5' in the 'Patients' column, and '02 Boston' with a value of '3' in the 'Patients' column. At the bottom of the table are two buttons: 'Add' and 'Reset'.

Site	Patients
01 New Haven	5
02 Boston	3

The next form shows that 8 new patients in total were added, with 40 barcodes for each. These 40 barcodes are from 10 aliquots for each of the 4 sample types (2 on each time point) in the protocol created. Patient IDs are automatically generated by the system using the following method. Study Id (3 chars) + "-" + Site Id (2 chars) + "-" + sequence number (4 chars). (e.g.: "A11-01-0001")

Studies [42] A11	Sites [2]	Timepoints [2]	Samplestypes	Barcodes [320]	Patients [8]
Study Patients list <input type="button" value="Search"/> <input type="button" value="Add full protocol"/> <input type="button" value="Add Selected"/>					
Id	Alternative Id	Barcodes	Date added		
A11-01-0001		40	10/7/2016 4:31:30 PM		
A11-01-0002		40	10/7/2016 4:31:31 PM		
A11-01-0003		40	10/7/2016 4:31:31 PM		
A11-01-0004		40	10/7/2016 4:31:31 PM		
A11-01-0005		40	10/7/2016 4:31:31 PM		
A11-02-0001		40	10/7/2016 4:31:32 PM		
A11-02-0002		40	10/7/2016 4:31:32 PM		
A11-02-0003		40	10/7/2016 4:31:33 PM		

Additionally, you can print all the barcodes for these patients as seen in the screenshot below.

Studies [41] AIN	Sites [2]	Timepoints [1]	Samplestypes	Barcodes [10079]	Patients [404]
Study Patients list <input type="button" value="Search"/> <input type="button" value="Add full protocol"/> <input type="button" value="Add Selected"/>					
New patients: [7] Print barcodes (Standard / Small)					
Id	Alternative Id	Barcodes	Date added		
AIN-01-0268		23	4/26/2017 12:02:23 AM		
AIN-01-0269		23	4/26/2017 12:02:23 AM		
AIN-01-0270		23	4/26/2017 12:02:23 AM		
AIN-01-0271		23	4/26/2017 12:02:23 AM		
AIN-01-0272		23	4/26/2017 12:02:23 AM		
AIN-02-0131		23	4/26/2017 12:02:23 AM		
AIN-02-0132		23	4/26/2017 12:02:23 AM		

After adding it shows the list of added patients (so they can be verified or copied). And links to print those patients barcodes

2.3.2 Adding Selected Protocol Patients

This method for adding patients will allow you to add barcodes for specific portions of the protocol. The next form shows adding Day 1 and Day 2 urine barcodes (hold Ctr key to select more than one sampletype) for 3 patients in the New Haven site.

Studies [42] A11	Sites [2]	Timepoints [2]	Sampletypes	Barcodes [320]	Patients [8]
Patients & Barcode Generation (2) Select site and Timepoint/Sampletypes to generate for the patients					
Site		New Haven ▾			
Timepoint / Sampletypes		Day 1 - Blood ▲ Day 1 - Urine Day 2 - Blood Day 2 - Urine ▾			
Patients		3			
Reset		Add			

After clicking on “Add”, we see highlighted in yellow below the 20 barcodes added to each of the 3 new patients in the New Haven (01) site.

Studies [42]
A11

Sites [2]

Timepoints [2]

Sampletypes

Barcodes [380]

Patients [11]

Study Patients list

Search

Add full protocol

Add Selected

Id	Alternative Id	Barcodes	Date added
A11-01-0001		40	10/7/2016 4:31:30 PM
A11-01-0002		40	10/7/2016 4:31:31 PM
A11-01-0003		40	10/7/2016 4:31:31 PM
A11-01-0004		40	10/7/2016 4:31:31 PM
A11-01-0005		40	10/7/2016 4:31:31 PM
A11-01-0006		20	10/7/2016 4:32:57 PM
A11-01-0007		20	10/7/2016 4:32:57 PM
A11-01-0008		20	10/7/2016 4:32:57 PM
A11-02-0001		40	10/7/2016 4:31:32 PM
A11-02-0002		40	10/7/2016 4:31:32 PM
A11-02-0003		40	10/7/2016 4:31:33 PM

If we click on a patient, a list of the 40 barcodes is displayed. Each of the barcodes has the status “Created.”

2.3.3 Patient Barcode Printing

Studies [42] A11	Sites [2]	Timepoints [2]	Sampletypes	Barcodes [40]	Patients [11] A11-01-0001
---------------------	-----------	----------------	-------------	---------------	------------------------------

Study	A11
Id	A11-01-0001
Site prefix	
Site Id	

Barcodes: **(Print All)** - **(Print Selected)** - Sample Locations: **(Report)**

Barcode	Parent	Timepoint	Sampletype	A.Seq#	Status	Freezer
300092895		Day 1	Blood	1	c	
300092896		Day 1	Blood	2	c	
300092897		Day 1	Blood	3	c	
300092898		Day 1	Blood	4	c	
300092899		Day 1	Blood	5	c	
300092900		Day 1	Blood	6	c	
300092901		Day 1	Blood	7	c	
300092902		Day 1	Blood	8	c	
300092903		Day 1	Blood	9	c	

While on any patient page, clicking “Print All”, displays a page with all barcodes for that patient using label print format (5x12). Right click or press Ctrl-P to print. Check that by default your browser does not add page counter, headers or footers.



Clicking on “Print Selected”, will pull up a form to select specific timepoint - sample type barcodes for a patient.

Barcode select printing
Timepoint/Sampletypes to generate the barcodes

Timepoint/Sampletypes

- Day 1 - Blood
- Day 1 - Urine
- Day 2 - Blood
- Day 2 - Urine

Reset Print Selected

 300092895 A11-01-0001 1112223344 Blood 1-10 Day 1	 300092896 A11-01-0001 1112223344 Blood 2-10 Day 1	 300092897 A11-01-0001 1112223344 Blood 3-10 Day 1	 300092898 A11-01-0001 1112223344 Blood 4-10 Day 1	 300092899 A11-01-0001 1112223344 Blood 5-10 Day 1
 300092900 A11-01-0001 1112223344 Blood 6-10 Day 1	 300092901 A11-01-0001 1112223344 Blood 7-10 Day 1	 300092902 A11-01-0001 1112223344 Blood 8-10 Day 1	 300092903 A11-01-0001 1112223344 Blood 9-10 Day 1	 300092904 A11-01-0001 1112223344 Blood 10-10 Day 1
 300092915 A11-01-0001 1112223344 Blood 1-10 Day 2	 300092916 A11-01-0001 1112223344 Blood 2-10 Day 2	 300092917 A11-01-0001 1112223344 Blood 3-10 Day 2	 300092918 A11-01-0001 1112223344 Blood 4-10 Day 2	 300092919 A11-01-0001 1112223344 Blood 5-10 Day 2
 300092920 A11-01-0001 1112223344 Blood 6-10 Day 2	 300092921 A11-01-0001 1112223344 Blood 7-10 Day 2	 300092922 A11-01-0001 1112223344 Blood 8-10 Day 2	 300092923 A11-01-0001 1112223344 Blood 9-10 Day 2	 300092924 A11-01-0001 1112223344 Blood 10-10 Day 2

Additional ways to print desired barcodes can be reached under “Reports” on the main menu. More details on how to use them can be found later in this manual.

2.3.4 Searching for Patients

When a large number of patients are in a study, navigating through many pages can be cumbersome. The search button provides a form to search for patients.

The screenshot shows the 'Study Patients list' interface. At the top, there are tabs for 'Studies [42]', 'Sites [11]', 'Timepoints [18]', 'Sampletypes', 'Barcodes [486055]', and 'Patients [3200]'. The 'Patients' tab is selected. Below the tabs, there are buttons for 'Search', 'Add full protocol', and 'Add Selected'. The 'Search' button is highlighted with a mouse cursor. Below these buttons is a table with the following columns: 'Id', 'Alternative Id', 'Barcodes', and 'Date added'.

Id	Alternative Id	Barcodes	Date added
CAR-001-0001	A-52092827	160	
CAR-001-0002	NA-M2121134	158	
CAR-001-0003	E-41285590	159	
CAR-001-0004	J-N21131884	330	
CAR-001-0005	J-R2128485	159	
CAR-001-0006	R-W1487132	88	
CAR-001-0007	F-02140940	159	

Type in a few characters (3 or more) to search for and select the desired patient.

The screenshot shows the 'Patient Search' interface. At the top, there are tabs for 'Studies [42]', 'Sites [11]', 'Timepoints [18]', 'Sampletypes', 'Barcodes [486055]', and 'Patients [3200]'. The 'Patients' tab is selected. Below the tabs, there is a 'Patient Search' section with a label 'Type patient Id to Search'. A search bar contains the text '0200'. A dropdown list is open, showing the following patient IDs: 'CAR-001-0200', 'CAR-003-0200', 'CAR-005-0200', and 'CAR-009-0200'. The 'CAR-005-0200' option is highlighted with a yellow background and a mouse cursor.

2.4 Samples/Barcodes

Samples can be managed only on studies that are in Recruit or Store mode. The difference is that in Store mode, no more patients can be added to the study. To process samples in a given study, select “Barcodes”, from the breadcrumbs bar.

Studies [41]
CAR

Sites [11]

Timepoints [19]

Sampletypes

Barcodes [489111]

Patients [3205]

Search [Print] [Collect] [Split] Change batch to: [Unfilled] [Disposed] [Consumed] [Created]

Study - Barcodes

1 < 1 > 12228

Barcode	Parent	Daug.	Patient	Timepoint	Sampletype	A.Seq#	Status	Status date
3022			CAR-003-0234	Day 2	Urine		Shipped	3/2/2009 12:00:00 AM
249129			CAR-001-0001	Base	Blood		Shipped	11/27/2009 12:00:00 AM
249133			CAR-001-0001	Base	Blood		Filled	7/24/2008 11:23:40 AM

Immediately below the breadcrumbs bar are listed the main operations that can be performed on samples: search, printing, collecting (scanning), and splitting barcodes into daughter aliquots. These operations are described below. If you are an administrator, you will also have access to the batch functions on the right: unfilled, disposed, consumed, and created. These functions will change a list of barcodes to the status which you select. More details will be listed below.

2.4.1 Barcode Search

This function allows you to quickly find a barcode in a study without needing to browse through hundreds of them. Just click “Search.”

Studies [42]
CAR

Sites [11]

Timepoints [18]

Sampletypes

Barcodes [486055]

Patients [3200]

Search

[\[Print Barcodes \]](#)

[\[Collected Samples \]](#)

[\[Unfilled samples \]](#)

[\[Split into daughter Aliquots \]](#)

Study - Barcodes

1 ≤ 1 ≥ 12152

Barcode	Parent	Daug.	Patient	Timepoint	Sampletype	A.Seq#	Status	Status date
249126			CAR-001-0001	Base	Blood	18	Filled	7/24/2008 11:22:19 AM
249134			CAR-001-0001	Base	Blood		Filled	7/24/2008 11:23:48 AM
249142			CAR-001-0001	Base	Urine		Filled	7/23/2008 10:46:01 AM
250408			CAR-001-0001	Day 1	Blood		Shipped	11/27/2009 12:00:00 AM
250416			CAR-001-0001	Day 2	Urine	18	Filled	7/23/2008 10:46:53 AM

Type a few characters of the barcode, and select from the list. Note in the figure below, that to help identify all barcodes, some barcodes from other studies may be listed, but are non-selectable.

The image shows a web-based 'Barcode Search' interface. At the top, there is a text input field labeled 'Barcode' with the value '4452' entered. Below the input field is a dropdown menu displaying a list of search results. The results are organized into rows, each containing a barcode, a study ID, a sample type, a quantity, and a status. The row with the barcode '424452' is highlighted in yellow, and a mouse cursor is pointing at it. The other rows are in a light gray background, indicating they are not selectable.

Barcode	Study ID	Sample Type	Quantity	Status
14452	HSP-01-0250	Urine	3	Shipped
34452	HRS-02-0018	Blood	3	Filled
294452	CAR-002-0010	Dy1 12-18hr - Urine	-	Filled
424452	CAR-003-0056	Day 5 - Urine	-	Filled
444452	CAR-001-0065	Day 1 - Blood	-	Shipped
444520	CAR-001-0065	Day 3 - Blood	-	Shipped

2.4.2 Printing Barcodes

In addition to being able to print barcodes in the patient section, you can also print barcodes of several patients in one single batch. From the samples menu bar just below the breadcrumbs menu, select "Print Barcodes". The next form allows you to select a range of patients IDs, timepoint-sampletype combinations, and aliquots to print their barcodes in one batch.

Barcode Batch Printing	
Study	CAR
Paste Patient list	<div></div>
Select Patients	<div> <div>CAR-001-0001</div> <div>CAR-001-0002</div> <div>CAR-001-0003</div> <div>CAR-001-0004</div> <div>CAR-001-0005</div> <div>CAR-001-0006</div> <div>CAR-001-0007</div> <div>CAR-001-0008</div> <div>CAR-001-0009</div> <div>CAR-001-0010</div> <div>CAR-001-0011</div> <div>CAR-001-0012</div> <div>CAR-001-0013</div> <div>CAR-001-0014</div> <div>CAR-001-0015</div> <div>CAR-001-0016</div> <div>CAR-001-0017</div> <div>CAR-001-0018</div> <div>CAR-001-0019</div> <div>CAR-001-0020</div> </div>
All Protocol	<input type="checkbox"/>
Timepoint - Sampletype	<div> <div>Base - Blood</div> <div>Base - DNA</div> <div>Base - EmptyTube</div> <div>Base - Urine</div> <div>Dy1 0-6hr - Blood</div> <div>Dy1 0-6hr - Urine</div> </div>
Aliquot numbers	<div></div>
Output	Standard Labels ▾
<div>Submit</div>	

2.4.3 Collecting Samples

Once the barcodes are generated, printed, and stuck on vials, they are available to be filled with samples. When filled, they are placed in boxes, scanned, and stored in freezers.

To start this procedure, select “Collected Samples” from a study’s “Barcodes” page. This function can also be accessed from a link on the home page. In that instance, you must select the desired study before reaching the “Collected Samples” function.

Studies [41] CAR	Sites [11]	Timepoints [18]	Sampletypes	Barcodes [486055]	Patients [3200]
<div> <div>Search</div> <div>[Print Barcodes]</div> <div>[Collected Samples]</div> <div>[Unfilled samples]</div> <div>[Split into daughter Aliquots]</div> </div>					

Studies [41] CAR	Sites [11]	Timepoints [18]	Sampletypes	Barcodes [486055]	Patients [3200]
---------------------	------------	-----------------	-------------	-------------------	-----------------

Collecting Samples.
Choose freezer location and scan each of the samples collected. Verify Box's Row and Column. Click Update to accept, and continue with next sample.

	Update	Cancel
Barcode		
Freezer location		
Row,Column	▼	

On the next form, scan or type in the barcode. Note that barcodes from all studies can be shown in here, but only those in the study that are ready to be collected (created status) will be selectable. If you are using a barcode reader, a valid full barcode will be entered, the system will automatically select it, and advance to the freezer location box.

Below is an example of typing in a selected sample:

In the drop-down list, it is shown the patient id, timepoint, sampletype and status.

Collecting Samples.
Choose freezer location and scan each of the samples collected. Verify Box's Row and Column. Click Update to accept, and continue with next sample.

	Update	Cancel
Barcode	97530	
Freezer location	397530 CAR-003-0044 Base - Urine - Shipped 497530 CAR-008-0007 Day 1 - Urine - Created 697530 CAR-002-0044 Day 4 - Blood - Filled 797530 CAR-001-0242 Day 2 - Blood - Unused 897530 CAR-001-0303 Day 3 - Urine - Filled 975300 CAR-011-0060 Day 1 12-18hr - Urine - Created 975301 CAR-011-0060 Day 1 12-18hr - Urine - Created	
Row,Column		

Then, in the freezer location box, type a few characters of a freezer name. A full list of all locations of that freezer is shown. To make the list more specific, type a comma “,” and the rack (e.g.”c”) to further narrow the list. In the drop-down list, it is shown: freezer name, rack, slot number, number of current samples in the box, sampletype id (20=urine), last used box row (E1) and patient id.

Collecting Samples.

Choose freezer location and scan each of the samples collected. Verify Box's Row and Column. Click Update to accept, and continue with next sample.

<input type="button" value="Update"/> <input type="button" value="Cancel"/>	
Barcode	x 975300 CAR-011-0060 Dy1 12-18hr - Urine - 1 Created
Freezer location	ESC.C
Row,Column	ESCALADE C 1 100 20 J10 CAR-001-0701 ESCALADE C 2 90 20 J10 CAR-001-0700 ESCALADE C 3 94 20 J10 CAR-001-0704 ESCALADE C 4 92 20 J10 CAR-001-0714 ESCALADE C 5 40 20 E 1 CAR-001-0704 ESCALADE C 6 89 20 J10 CAR-001-0711

The system checks on the box located in that freezer location for available row/columns positions, and presents the next available for the current patient/sample. Leave or select a different position and click update or hit [Enter].

Collecting Samples.

Choose freezer location and scan each of the samples collected. Verify Box's Row and Column. Click Update to accept, and continue with next sample.

<input type="button" value="Update"/> <input type="button" value="Cancel"/>	
Barcode	x 975300 CAR-011-0060 Dy1 12-18hr - Urine - 1 Created
Freezer location	x ESCALADE C 5 40 20 E 1 CAR-001-0704
Row,Column	F, 1

On the next screen, we see a new entry form, with confirmation that a sample has been marked as collected in the "processed barcodes" table highlighted below. Note like before that the Row, Column has been updated to next row. That will be used or updated in case the next barcode belongs to the same patient or a new one.

Collecting Samples.

Choose freezer location and scan each of the samples collected. Verify Box's Row and Column. Click Update to accept, and continue with next sample.

<input type="button" value="Update"/> <input type="button" value="Cancel"/>	
Barcode	
Freezer location	x ESCALADE C 5
Row,Column	G, 1

Processed Barcodes: 1									
UID	Patient	Timepoint	Sampletype	Location	Row	Col	Status	Status date	
975300	CAR-011-0060	Dy1 12-18hr	Urine	ESCALADE C 5	F	1	Filled	6/26/2017 8:10:13 AM	

If we chose a new sample from the same patient, the Row,Column will be updated to F2; the next available position for the same patient.

Collecting Samples.
Choose freezer location and scan each of the samples collected. Verify Box's Row and Column. Click Update to accept, and continue with next sample.

Update Cancel

Barcode x 975276 | CAR-011-0060 | Dy1 0-6hr - Urine - Created

Freezer location x ESCALADE | C | 5

Row,Column F,2 ▼

Processed Barcodes: 1

UID	Patient	Timepoint	Sampletype	Location	Row	Col	Status	Status date
975300	CAR-011-0060	Dy1 12-18hr	Urine	ESCALADE C 5	F	1	Filled	6/26/2017 8:10:13 AM

SIMS will prepopulate Freezer location and Row,Column with the next available row, but this will change to the next available location when the barcode is scanned. Once the first barcode has been scanned, you will not need to click update anymore. Instead, you can hit Enter to update after all the information for the next barcode you scan has loaded. **Note: You MUST wait for the barcode information to load in after scanning. Failure to do so before hitting enter will clear the box. Additionally, you must wait until the Row,Column field has finished updating as well or else the sample will scan in without this information.**

After updating the new entry is displayed in the processed barcodes table.

Collecting Samples.
Choose freezer location and scan each of the samples collected. Verify Box's Row and Column. Click Update to accept, and continue with next sample.

Update Cancel

Barcode

Freezer location x ESCALADE | C | 5

Row,Column G, 1 ▼

Processed Barcodes: 2

UID	Patient	Timepoint	Sampletype	Location	Row	Col	Status	Status date
975276	CAR-011-0060	Dy1 0-6hr	Urine	ESCALADE C 5	F	2	Filled	6/26/2017 8:25:48 AM
975300	CAR-011-0060	Dy1 12-18hr	Urine	ESCALADE C 5	F	1	Filled	6/26/2017 8:10:13 AM

Note: Once a box is filled, the user must advance to the next freezer location, as the system will not move to the next available box automatically.

If you wish to skip a space in the box, manually select the Row,Column location and SIMS will continue from there.

2.4.3.1 Troubleshooting Scanning Issues

- Desired Freezer location cannot be selected
 - Check that the barcode you scanned is of the same study as the rest of the box.
 - Check that the sampletype is the same.
 - If the last row in the box is filled, you cannot use the scanning module. Ask an administrator to edit the barcodes you wish to scan manually from their records, or batch change the last row to “created” before rescanning all samples.
- Desired row, column cannot be selected
 - If the sample is NOT DNA, ExtraUrine, or ExtraPlasma check that the sample belongs to the same patient as the rest of the samples in the row.

2.4.4 Unfilled Samples

Sometimes collecting all samples is not possible. Barcodes left unused can be reported to the system in the following way by an administrator.

From a study’s “Barcodes” page, select “Unfilled Samples.”

Studies [41] CAR	Sites [11]	Timepoints [19]	Sampletypes	Barcodes [489111]	Patients [3205]
---------------------	------------	-----------------	-------------	-------------------	-----------------

Search [Print] [Collect] [Split] Change batch to: [Unfilled] [Disposed] [Consumed] [Created]

Study - Barcodes

1 ≤ 1 ≥ 12228

Barcode	Parent	Daug.	Patient	Timepoint	Sampletype	A.Seq#	Status	Status date
249126			CAR-001-0001	Base	Blood	18	Filled	7/24/2008 11:22:19 AM
249130			CAR-001-0001	Base	Blood		Shipped	4/11/2011 12:00:00 AM

On the next screen, paste a list of unused barcodes separated by hard returns. Make sure there is no return at the end of the list.

Studies [41] CAR	Sites [11]	Timepoints [19]	Sampletypes	Barcodes [489111]	Patients [3205]
---------------------	------------	-----------------	-------------	-------------------	-----------------

Barcode Batch Processing: "Unfill barcodes"

Paste a list of barcodes from this study.

Barcodes in the list require a previous status of 'Created'

	Update Cancel
Study	CAR
Process type	Unfill barcodes
Barcode(s) list	<div></div>

On the next screen, confirmation is displayed of the processed barcodes below, including the total count on the current session.

2.4.5 Daughter Aliquot Generation

Sometimes a sample needs to be split into smaller containers. This is initiated by selecting “Split”.

Studies [41] CAR	Sites [11]	Timepoints [19]	Sampletypes	Barcodes [489111]	Patients [3205]
---------------------	------------	-----------------	-------------	-------------------	-----------------

Search [Print] [Collect] **[Split]** Change batch to: [Unfilled] [Disposed] [Consumed] [Created]

Study - Barcodes

1 < 1 > 12228

Barcode	Parent	Daug.	Patient	Timepoint	Sampletype	A.Seq#	Status	Status date
249126			CAR-001-0001	Base	Blood	18	Filled	7/24/2008 11:22:19 AM
249130			CAR-001-0001	Base	Blood		Shipped	4/11/2011 12:00:00 AM

This process can be applied to one or more filled samples by pasting in a list separated by hard returns. After entering them, specify if the parent samples will be entirely consumed*, the number of daughters generated, and the volume of each of the daughter aliquots (use a single quantity for all, or one value for each daughter in the sequence). Separate values with a comma.

Barcode Split - Daughter Aliquots.

Update Cancel	
Barcodes to split	<div></div>
Barcode(s) to split	<div></div>
Sample consumed?	<input checked="" type="checkbox"/>
Number of daughters	10 ▼
Aliquot split volume	<div></div>
<i>Specify the quantity for each aliquot. Separate by comma.</i>	

***Note:** If generating daughters for samples which will filled elsewhere, do NOT check “Sample consumed?”. You will ship the parents out to create a verifiable manifest.

After the daughter aliquots are generated, we can print their labels, affix them to new vials, resample the parent, and discard the parent container if consumed.

Studies [42]
CAR

Sites [11]

Timepoints [18]

Sampletypes

Barcodes [486063]

Patients [3200]

Daughter Aliquots Generated: [Print barcodes](#)

Barcode	Parent	Timepoint	Sampletype	Quantity	Ali.Seq.#	Status	Date
300093275	249131	Base	Blood	100.00	1	Created	10/7/2016 5:23:39 PM
300093276	249131	Base	Blood	150.00	2	Created	10/7/2016 5:23:39 PM
300093277	249131	Base	Blood	250.00	3	Created	10/7/2016 5:23:39 PM
300093278	249131	Base	Blood	500.00	4	Created	10/7/2016 5:23:39 PM
300093279	249132	Base	Blood	100.00	1	Created	10/7/2016 5:23:39 PM
300093280	249132	Base	Blood	150.00	2	Created	10/7/2016 5:23:39 PM
300093281	249132	Base	Blood	250.00	3	Created	10/7/2016 5:23:39 PM
300093282	249132	Base	Blood	500.00	4	Created	10/7/2016 5:23:39 PM

A daughter aliquot always has the barcode of its parent listed in the “Parent” column, and if a parent has been split into daughters, the number of daughters it has is listed in the “Daughter” column. If you select a parent’s barcode, the records for its daughters are listed in its sample details.

2.4.6 Shipping Samples

This operation is explained in the Shipping section later.

2.4.7 Summary

Abbreviations for barcode status are listed below as a recap. This is available under “Configuration.”

Barcode Status List

<u>I</u> d	<u>P</u> revious	<u>S</u> equence	<u>N</u> ame	<u>D</u> escription
<u>?</u>		1	Unknown	Undetermined satus
<u>c</u>		2	Created	Generated by the system. Pending collection
<u>f</u>	c	3	Filled	Sample was collected and should be located in a freezer box
<u>e</u>	f	4	Consumed	Used by the lab
<u>u</u>	c	5	Unused	Sample was not collected
<u>s</u>	f	6	Shipped	Aliquot was shipped out
<u>d</u>	f	8	Disposed	Aliquot has been disposed/destroyed

2.4.8 Manual Barcode Changes

This function is available to administrators. After selecting a barcode record, click “Edit.” This will open the fields for changes after which you must select “Update” to save changes.

Studies [41]	Sites [11]	Timepoints [19]	Sampletypes [4]	Barcodes [160]	Patients [3205]
CAR		Base	Blood	249126	CAR-001-0001

Barcode

Editing ...	Update	Cancel
Id	249126	
Parent		
Daughters	0	
Patient	CAR-001-0001	
Timepoint	Base ▼	
Sampletype	Blood ▼	
Aliquot Seq.Number	18	
Quantity	0	
Status	Filled	
New Status	Filled ▼	
Freezer Location		
Location	x HUMMER T 1	
Row,Column	A,1 ▼	
Comment	Blood	
Status date	7/24/2008 11:22:19 AM	
User Id		

3 Freezers

Samples are stored in freezers. We access the freezer list on the main menu bar.

Home

Studies

Shipments

Freezers

Reports

Configura

Freezers [21]

Locations

Freezers List

New

ID	Name	Location	Shelves	Racks	Slots	Boxes	Locations	Reports
1	AUDI	TAC 4th floor	5	6	16	480	480	Samples - Patients - Sampletypes - Barcodes
2	BEETLE	TAC Basement	4	5	20	400	150	Samples - Patients - Sampletypes - Barcodes
3	DAISY	300 George Basement	4	6	24	576	576	Samples - Patients - Sampletypes - Barcodes
4	ESCALADE	TAC 4th Floor	5	6	20	600	600	Samples - Patients - Sampletypes - Barcodes
5	FORD	TAC 4th Floor	5	5	16	400	160	Samples - Patients - Sampletypes - Barcodes
6	HUMMER	TAC Basement	5	6	16	480	479	Samples - Patients - Sampletypes - Barcodes
7	IVY	300 George Basement	5	3	20	300	300	Samples - Patients - Sampletypes - Barcodes
8	JAGUAR	300 George Basement	4	6	24	576	576	Samples - Patients - Sampletypes - Barcodes
9	JEEP	TAC 4th Floor	5	6	16	480	480	Samples - Patients - Sampletypes - Barcodes

This list shows a summary of all freezers, including the number of boxes that a freezer can hold. This quantity is calculated from the product of the shelves, racks, and slots. The number of boxes should match the number of locations. If you are a system administrator, you can add new freezers.

3.1 Adding Freezers.

The “New” button leads to a page to specify characteristics on a new freezer.

Freezers [21]		Locations
Adding ...		<input type="button" value="Update"/> <input type="button" value="Cancel"/>
Id	0	
Name	CADILLAC	
Location	300 George St.	
Purchase date	10/01/2016	
Brand	HAIER	
Model	DW-86L729	
Incidents	Reorder power cord, came wrong type	
Shelves	5 ▼	
Racks per shelf	4 ▼	
Slots per rack	16 ▼	

When finished, press update. The following image shows the information generated for the new freezer, including the freezer locations given by the internal system coordinates: Racks (A to T), Slots (1 to 16).

Rack letters are assigned by multiplying Shelves by the Racks per shelf. (4x5=20) = (A to T). When more letters are needed, the system uses a double letter nomenclature. AA, BB, ...

Freezers [22]

CADILLAC

Locations [320]

Add

Edit

Delete

Id	22
Name	CADILLAC
Location	300 George St.
Purchase date	10/1/2016 12:00:00 AM
Brand	HAIER
Model	DW-86L729
Incidents	Reorder power cord, came wrong type
Shelves	5
Racks per shelf	4
Slots per rack	16

Rack:

Slot:

Filter

Studies

Study patients

Freezer Locations

Id	Study	Rack	Slot	Barcodes	Reserved
9391		A	1	0	False
9392		A	2	0	False
9393		A	3	0	False
9394		A	4	0	False
9395		A	5	0	False
9396		A	6	0	False
9397		A	7	0	False
9398		A	8	0	False
9399		A	9	0	False
9400		A	10	0	False
9401		A	11	0	False
9402		A	12	0	False
9403		A	13	0	False
9404		A	14	0	False
9405		A	15	0	False
9406		A	16	0	False
9407		B	1	0	False
9408		B	2	0	False
9409		B	3	0	False
9410		B	4	0	False

1

2

3

4

5

6

7

8

9

10

>

>>

In a populated freezer (like the one shown below), beside the list of all freezer locations (table at the bottom left of the screen), there is a table on the right that shows the number of studies and patients in that freezer.

Freezers [22]

Locations [576]

SUBARU

Add

Edit

Id

17

Name

SUBARU

Location

300 George Basement

Purchase date

Brand

Model

Incidents

Shelves

4

Racks per shelf

6

Slots per rack

24

Rack:

Slot:

Filter

Freezer Locations

Id	Study	Rack	Slot	Barcodes	Reserved
7083		A	1	0	False
7084		A	2	0	False
7085		A	3	0	False
7086		A	4	0	False
7087		A	5	0	False
7088		A	6	0	False
7089		A	7	0	False
7090		A	8	0	False
7091		A	9	0	False
7092		A	10	0	False
7093		A	11	0	False
7094		A	12	0	False
7095		A	13	0	False
7096		A	14	0	False
7097		A	15	0	False
7098		A	16	0	False
7099		A	17	0	False
7100		A	18	0	False
7101		A	19	0	False
7102		A	20	0	False

1

2

3

4

5

6

7

8

9

10

>

>>

Studies

Study	patients
BBS	15
BSH	20
ND	1159

Clicking on any of the freezer locations will lead to a page that shows all barcodes located in the box at that location.

Freezers [22]

AUDI

Locations [480]

401

Relocate Box

Edit

Id	401
Freezer Id	1
Freezer	AUDI
Study	CAR
Rack	A
Slot	1
Reserved	False

Barcodes in Location (84)

Barcode	Parent	Patient	Row	Col	TimePoint	SampleType	Consumed
388357		CAR-005-0001			Dy1 0-6hr	Urine	False
388358		CAR-005-0001			Dy1 0-6hr	Urine	False
388359		CAR-005-0001			Dy1 0-6hr	Urine	False
388360		CAR-005-0001			Dy1 0-6hr	Urine	False
388361		CAR-005-0001			Dy1 0-6hr	Urine	False
388362		CAR-005-0001			Dy1 0-6hr	Urine	False
388363		CAR-005-0001			Dy1 0-6hr	Urine	False
388364		CAR-005-0001			Dy1 0-6hr	Urine	False
388367		CAR-005-0001			Dy1 6-12hr	Urine	False
388368		CAR-005-0001			Dy1 6-12hr	Urine	False
388369		CAR-005-0001			Dy1 6-12hr	Urine	False
388370		CAR-005-0001			Dy1 6-12hr	Urine	False
388371		CAR-005-0001			Dy1 6-12hr	Urine	False
388372		CAR-005-0001			Dy1 6-12hr	Urine	False
388373		CAR-005-0001			Dy1 6-12hr	Urine	False
388374		CAR-005-0001			Dy1 6-12hr	Urine	False
388375		CAR-005-0001			Dy1 12-18hr	Urine	False
388377		CAR-005-0001			Dy1 12-18hr	Urine	False

Each barcode and patient link leads to the details for that item.

3.2 Deleting Freezers

Freezers can only be deleted if they are empty. Pressing the Delete button will confirm whether or not this operation can be performed.

3.3 Freezer Location

A freezer location is a place where a box can be placed. When a freezer location is occupied by a box, that box is identified with that location ID. All freezer locations begin empty; once a box starts to fill with samples, they are listed in the Location page.

3.3.1 Reserve/Unreserve a Freezer Location and Adding Comments

In some situations, it is necessary to reserve or free some freezer locations. This can be done by using the [Edit] button, and checking or unchecking the reserve checkbox. Additionally, you can leave free text comments on the location.

Freezers [21] AUDI	Locations [480] 401
<div>UpdateCancel</div>	
Id	401
Freezer Id	1
Freezer	AUDI
Study	CAR
SampleType	Urine
Rack	A
Slot	1
Reserved	<input type="checkbox"/>
Daughter Aliquots	<input type="checkbox"/>
Comment	

Reserved boxes and comments can be viewed in multiple reports detailed later in the manual. Reserved locations will be grayed out in most freezer reports.

3.3.2 Relocating Boxes

Whole boxes can be relocated to unfilled locations in freezers. To do so, navigate to an individual location from Freezers and click “Relocate box.”

Freezers [21]
ESCALADE

Locations [600]
3745

Relocate Box

Edit

Id	3745
Freezer Id	4
Freezer	ESCALADE
Study	CAR
Rack	A
Slot	1
Reserved	False

Barcodes in Location (68)

Barcode	Parent	Patient	Row	Col	TimePoint	SampleType	Consumed
1215899		CAR-001-0536			Day 5	Urine	False
1215900		CAR-001-0536			Day 5	Urine	False
1215901		CAR-001-0536			Day 5	Urine	False
1215902		CAR-001-0536			Day 5	Urine	False
1215903		CAR-001-0536			Day 5	Urine	False
1215904		CAR-001-0536			Day 5	Urine	False

Type in the target location and press update on the next screen.

Freezers [21]
ESCALADE

Locations [600]
3745

Relocating Barcodes

Type Freezer, Rack

Current location	ESCALADE A 1 Show
Target location	
	<div>Submit</div>

3.4 Freezer Reports

There are five types of reports accessible from the main Freezer list page. The first three and last report can be displayed on the screen, printed (select and press Ctrl+P), or exported to excel (via an Export button on each of the reports). The Barcodes report can only be exported to Excel. Reserved spaces will be grayed out in each of these reports.

Freezers List

[New](#)

Id	Name	Location	Shelves	Racks	Slots	Boxes	Locations	Reports
1	AUDI	TAC 4th Floor	5	6	16	480	480	Samples - Patients - Sampletypes - Barcodes - Comments
2	BEETLE	TAC Basement	4	5	20	400	400	Samples - Patients - Sampletypes - Barcodes - Comments
3	DAISY	300 George Basement	4	6	24	576	576	Samples - Patients - Sampletypes - Barcodes - Comments

3.4.1 Freezer Samples Report

This provides the number of samples by shelf, rack and slot.

Freezer - Total Barcodes (8/15/2016 10:26:29 AM)

Id	1
Name	AUDI
Site Id	16
Location	TAC 4th floor
Shelves	5
Racks/Self	6
Slots/Rack	16
Total Boxes	480

Switch to: [Samples](#) - [Patients](#) - [Sampletypes](#)

[Export](#)

S1:

A1	83	B1	173	C1	79	D1	163	E1	77	F1	126
A2	77	B2	76	C2	78	D2	79	E2	60	F2	133
A3	74	B3	77	C3	76	D3	163	E3	44	F3	119
A4	75	B4	163	C4	164	D4	70	E4	16	F4	139
A5	77	B5	163	C5	78	D5	80	E5	28	F5	185
A6	79	B6	79	C6	81	D6	78	E6	30	F6	158
A7	80	B7	74	C7	76	D7	73	E7	49	F7	130

3.4.2 Freezer Patient Report

This provides a list of patients and their number of samples by shelf, rack and slot.

Freezer - Patient Barcodes (8/15/2016 10:24:54 AM)

Id	1
Name	AUDI
Site Id	16
Location	TAC 4th floor
Shelves	5
Racks/Self	6
Slots/Rack	16
Total Boxes	480

Switch to: [Samples](#) - **[Patients](#)** - [Sampletypes](#) Export

S1:											
A1	CAR-005-0001 (83)	B1	CAR-005-0017 (92) CAR-005-0018 (81)	C1	CAR-005-0037 (79)	D1	CAR-005-0055 (80) CAR-005-0074 (83)	E1	CAR-005-0075 (77)	F1	CAR-005-0001 (47) CAR-005-0002 (47) CAR-005-0377 (9) CAR-005-0378 (7) CAR-005-0379 (6) CAR-005-0380 (10)
A2	CAR-005-0002 (77)	B2	CAR-005-0019 (76)	C2	CAR-005-0038 (78)	D2	CAR-005-0057 (79)	E2	CAR-005-0076 (60)	F2	CAR-005-0003 (42) CAR-005-0004 (44) CAR-005-0377 (1) CAR-005-0378 (6) CAR-005-0379 (4) CAR-005-0380 (36)
A3	CAR-005-0003 (74)	B3	CAR-005-0020 (77)	C3	CAR-005-0039 (76)	D3	CAR-005-0058 (81)	E3	CAR-005-0077 (21)	F3	CAR-005-0005 (43)

3.4.3 Freezer SampleType Report

This provides a list of sample types and their number by shelf, rack and slot.

Sample types can be color-coded by system administrators on the system configuration page.

Freezer - SampleType Barcodes (8/15/2016 10:25:28 AM)

Id	1
Name	AUDI
Site Id	16
Location	TAC 4th floor
Shelves	5
Racks/Self	6
Slots/Rack	16
Total Boxes	480

Switch to: [Samples](#) - [Patients](#) - **[Sampletypes](#)**

Export

S1:									
	A1 Urine (83)	B1 Urine (173)	C1 Urine (79)	D1 Urine (163)	E1 Urine (77)	F1 Blood (126)			
	A2 Urine (77)	B2 Urine (76)	C2 Urine (78)	D2 Urine (79)	E2 Urine (60)	F2 Blood (86) Urine (47)			
	A3 Urine (74)	B3 Urine (77)	C3 Urine (76)	D3 Urine (163)	E3 Urine (44)	F3 Blood (119)			
	A4 Urine (75)	B4 Urine (163)	C4 Urine (164)	D4 Urine (70)	E4 Urine (16)	F4 Blood (93) Urine (46)			
	A5 Urine (77)	B5 Urine (163)	C5 Urine (78)	D5 Urine (80)	E5 Urine (28)	F5 Blood (185)			
	A6 Urine (79)	B6 Urine (79)	C6 Urine (81)	D6 Urine (78)	E6 Urine (30)	F6 Blood (92) Urine (66)			
	A7 Urine (80)	B7 Urine (74)	C7 Urine (76)	D7 Urine (73)	E7 Urine (40)	F7 Blood (120)			

3.4.4 Freezer Barcodes Report

This report provides details of all samples in a single freezer. Due to its size, it can only be downloaded.

Freezers List

New

Id	Name	Location	Shelves	Racks	Slots	Boxes	Locations	Reports
1	AUDI	TAC 4th floor	5	6	16	480	480	Samples - Patients - Sampletypes - Barcodes
2	BEETLE	TAC 4th Floor	4	5	20	400	150	Samples - Patients - Sampletypes - Barcodes
3	DAISY	300 George 7th Floor	4	6	24	576	576	Samples - Patients - Sampletypes - Barcodes
4	ESCALADE	TAC 4th Floor	5	6	20	600	600	Samples - Patients - Sampletypes - Barcodes
5	FORD	TAC 4th Floor	5	5	16	400	160	Samples - Patients - Sampletypes - Barcodes
6	HUMMER							Samples - Patients - Sampletypes - Barcodes

http://localhost:30277/FreezerReport/2/4 or save FreezerBarcodes636068536958628326.xlsx (215 KB) from localhost?

Open

Save

Cancel

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Barcode	Parent	Patient	Stud	FreezerName	Location	Rack	Row	Slot	Col	Timepoint	SampleType	AliqS	Status	StatusDate	User
90000234		HDA-01-0003	HDA	BEETLE	2490 F			1	B-9		Urine	9 f		7/7/2011 13:16	
90000264		HDA-01-0004	HDA	BEETLE	2490 F			1	B-9		Urine	9 f		7/7/2011 13:22	
90000231		HDA-01-0003	HDA	BEETLE	2490 F			1	B-6		Urine	6 f		7/7/2011 13:16	
90000241		HDA-01-0003	HDA	BEETLE	2490 F			1			Urine	6 f		7/7/2011 13:18	
90000242		HDA-01-0003	HDA	BEETLE	2490 F			1			Urine	7 f		7/7/2011 13:18	

This report can be filtered by each characteristic of a sample, making it the master report for a freezer.

3.4.5 Freezer Comments Report

This report displays all the comments on locations within a freezer. You can use this to find subgroups which were pulled from a study (ex. Klotho CAR samples) and to also track shipments which were returned but not rescanned into

Report: Freezer - Location Comments (5/16/2017 2:11:07 PM)

Id		18									
Name		TAHOE									
Site Id		16									
Location		TAC 4th Floor									
Shelves		5									
Racks/Self		4									
Slots/Rack		20									
Total Boxes		400									

Switch to: [Samples](#) - [Patients](#) - [Sampletypes](#) - [Comments](#) [Export](#)

S1:									
	A1		(d) B1	Klotho Urine Daughter 4	(d) C1	Klotho Urine Daughter 8	D1		Omics Plasma Parents
	A2		(d) B2	Klotho Urine Daughter 4	(d) C2	Klotho Urine Daughter 8	D2		Omics Plasma Parents
(d)	A3		(d) B3	Klotho Urine Daughter 4	C3		D3		Omics Urine Parents
	A4		(d) B4	Klotho Urine Daughter 4	C4		D4		Omics Urine Parents
	A5		(d) B5	Klotho Urine Daughter 5	C5		(d) D5		Omics Urine Daughter 1
	A6		(d) B6	Klotho Urine Daughter 5	C6		(d) D6		Omics Urine Daughter 1
(d)	A7	Klotho Plasma Daughter 6	(d) B7	Klotho Urine Daughter 5	C7		(d) D7		Omics Urine Daughter 3 (see 3/1/16 list)
(d)	A8	Klotho Plasma Daughter 6	(d) B8	Klotho Urine Daughter 5	C8		(d) D8		Omics Plasma Daughter 2 (see 3/1/16 list)
(d)	A9	Klotho Plasma Daughter 6	(d) B9	Klotho Urine Daughter 5	C9		D9		
(d)	A10	Klotho Plasma Daughter 6	(d) B10	Klotho Urine Daughter 5	C10		D10		

4 Shipments

From the main menu select “Shipments”, and a list of all shipments recorded by the system is presented in descending chronological order. The list can be sorted by each of the columns when a header is clicked.

Home

Studies

Shipments

Freezers

Reports

Configuration

Shipments [131]

ShippedBoxes [0]

Barcodes

ShippingLocations [31]

Shipments List

New

Id	Study	Shipment date	Destination	Contact	Boxes	Barcodes
468	AAA	9/30/2016 12:00:00 AM	Stephen Nolan, PhD	11	1054	57734
465	CAR	9/20/2016 12:00:00 AM	Attn: Wassim Obeid/	203-7637-5022	1	78
463	DDS	9/1/2016 12:00:00 AM	Attn: Wassim Obeid/	203-75	21	1630
461	CAR	7/20/2016 12:00:00 AM	Attn: Veena Rao/	Keith Rentfro 203-737-5022	1	40
459	CAR	7/15/2016 12:00:00 AM	Attn: Veena Rao/	Keith Rentfro 203-737-5022	6	410

4.1 Creating a New Shipment

Study administrators are allowed to create a new shipment. Press the “New” button. The next form shows the required information.

Shipments [131]	ShippedBoxes [0]	Barcodes	ShippingLocations [31]
[Print Report] [Export manifest]			
Adding ...		Update	Cancel
Id	0		
Shipment date	10/7/2016		
Received	<input type="checkbox"/>		
Study/Protocol			
Destination			
Destination site			
Site address			
Contact/Phone			
Special notations			
Shipping agency			
Tracking number			
Boxes	0		
Samples			

The green framed boxes, “study” and “destination,” are auto-populated lists that are filled with filtered choices when you type more than 3 characters contained in those categories. Type in three spaces to show all choices.

Shipments [131] ShippedBoxes [0] Barcodes ShippingLocations [31]

[Print Report] [Export manifest]

Adding ... Update Cancel

Id 0

Shipment date 10/7/2016

Received ☐

Study/Protocol x BSH - Biomarker Sample Handling
bio

Destination BSH - Biomarker Sample Handling
PBS - Protocol Biopsy Study HIC 140501-1040. Patient include PBMC, plasma, DNA, urine and renal biopsy

After selecting “Destination”, the destination site and site address are auto populated. Change the information if necessary. Changes here will not affect the Destination site information and will be specific to this shipment. Finish the rest of the fields and press “Update.”

Shipments [131] ShippedBoxes [0] Barcodes ShippingLocations [31]

[Print Report] [Export manifest]

Adding ... Update Cancel

Id 0

Shipment date 10/7/2016

Received ☐

Study/Protocol x BSH - Biomarker Sample Handling
bio

Destination x Argutus Medical

Destination site Stephen Nolan, PhD

Site address Argutus Medical Limited.
Pearse Street, Unit 9
Trinity Technology Campus
Dublin, D82

Contact/Phone 203 123 4567

Special notations

Shipping agency Fedex

Tracking number 123456789

Boxes 0

Samples

The new shipment information will be confirmed on the next page. Note the new Shipment ID under the shipments breadcrumbs bar.

To add shipment boxes, press the “Add” button.

Shipments [132] 469	ShippedBoxes [0]	Barcodes	ShippingLocations [31] Argutus Medical
------------------------	------------------	----------	---

[[Print Report](#)] [[Export manifest](#)]

	Add	Edit	Delete
--	---------------------	----------------------	------------------------

Id	469
Shipment date	10/7/2016
Received	False
Study/Protocol	BSH - Biomarker Sample Handling Show
Destination	Argutus Medical Show
Destination site	Stephen Nolan, PhD
Site address	Argutus Medical Limited, Pearse Street, Unit 9 Trinity Technology Campus Dublin, DB2
Contact/Phone	203 123 4567
Special notations	
Shipping agency	Fedex
Tracking number	123456789
Boxes	0
Samples	

[Add](#)

Shipment Boxes (0)

Id	Label	Destination	Source	Received	Barcodes
--------------------	-----------------------	-----------------------------	------------------------	--------------------------	--------------------------

Enter information related to the box and click “Update.” The new shipping box will be generated.

Shipments [132] 469	ShippedBoxes [0]	Barcodes	ShippingLocations [31] Argutus Medical
------------------------	------------------	----------	---

Adding ... [Update](#) [Cancel](#)

Id	0
Shipment Id	469
Received	<input type="checkbox"/>
Label	Box 1
Destination	
Date shipped	
Date data received	Lab C1
Source	

Barcodes in Box (0)

UID	B.Row	B.Col	Patient	Timepoint	SampleType	Quantity	Received
---------------------	-----------------------	-----------------------	-------------------------	---------------------------	----------------------------	--------------------------	--------------------------

Click on the “Add” button to start scanning samples to be shipped.

Shipments [132] 469	ShippedBoxes [1] 1884	Barcodes [0]	ShippingLocations [31] Argutus Medical
------------------------	--------------------------	--------------	---

Id	1884
Shipment Id	469
Received	False
Label	Box 1
Destination	
Date shipped	
Date data received	
Source	

Barcodes in Box (0)

UID	B.Row	B.Col	Patient	Timepoint	SampleType	Quantity	Received
-----	-------	-------	---------	-----------	------------	----------	----------

During a shipping scan, note the number of barcodes in that box. The system will automatically suggest the Row/Col location of the sample.

Shipments [132] 469	ShippedBoxes [1] 1884	Barcodes [0]	ShippingLocations [31] Argutus Medical
------------------------	--------------------------	--------------	---

Barcode Scan - Shipping Box.

Shipping Box	
Adding ...	<input type="button" value="Update"/> <input type="button" value="Cancel"/>
Shipping box Id	1884
Study	BSH
Barcode	
Row/Col	A,1 ▼

Note that only samples from the study specified in the shipment entry with a filled status will be allowed to be selected. If a scanner was used, a valid barcode will be automatically selected and the cursor advanced to the update button. Click “Update” or hit the [Enter] key when done.

Shipments [132] 469	ShippedBoxes [1] 1884	Barcodes [0]	ShippingLocations [31] Argutus Medical
------------------------	--------------------------	--------------	---

Barcode Scan - Shipping Box.

Shipping Box	
Adding ...	<input type="button" value="Update"/> <input type="button" value="Cancel"/>
Shipping box Id	1884
Study	BSH
Barcode	x 90003904 BSH-01-0001 Control - Urine - 4 Filled
Row/Col	A,1 ▼

The next screen shows confirmation of the previous scan (see highlighted “processed barcode” table below) and the updated number of barcodes (from 0 to 1) in the shipped box. It also automatically advances to the next Row/Col position “A2” in the box, for the next sample to be scanned. Continue repeating this step until that box is filled.

Shipments [132]
469

ShippedBoxes [1]
1884

Barcodes [1]
90003904

ShippingLocations [31]
Argutus Medical

Barcode Scan - Shipping Box.

Shipping Box

Update Cancel

Shipping box Id 1884

Study BSH

Barcode x 90003904 | BSH-01-0001 | Control | Urine | Shipped

Row/Col A,2 ▼

Processed Barcodes: 1

Barcode	Patient	Timepoint	Sampletype	Row	Col	Status	Status date
90003904	BSH-01-0001	Control	Urine			Shipped	10/7/2016 1:39:52 AM

If more boxes are needed, click on “ShippedBoxes” in the breadcrumb menu, to show the list. Click “New” for a new box.

Shipments [132]
469

ShippedBoxes [1]

Barcodes

ShippingLocations [31]
Argutus Medical

ShippedBox List

New

Id	Label	Destination	Source	Shipment	Barcodes	Received
1884	Box 1	Lab C1		469	1	False

4.2 Shipment Locations

From the shipments breadcrumbs menu, select “ShippingLocations” to show all registered locations.

Shipments [132]

ShippedBoxes [0]

Barcodes

ShippingLocations [31]

Shipping Locations List

New

Id	Name	City	State	Country	Shipments	Last modified
1	Bennett Lab Cincinnati	Cincinnati	OH	USA	4	5/9/2013 6:35:10 PM
2	Yale CRC	New Haven	CT		2	5/9/2013 6:36:56 PM
3	Han Lab, Jefferson U, Philadelphia	Philadelphia,	PA	USA	0	5/9/2013 6:38:08 PM
4	Keck Center Lab	West Haven	CT		3	5/9/2013 6:40:16 PM
5	Argutus Medical	Dublin	DB2	Ireland	2	5/9/2013 6:42:05 PM
6	Ware Lab, Vanderbilt	Nashville	TN		0	5/9/2013 6:43:59 PM
7	Sekisui/Genzyme	Framingham	MA		0	5/9/2013 6:45:53 PM
8	ASCESS AMT Control Lab	Minneapolis	MN		0	5/9/2013 6:47:47 PM

Click on “New” to enter a new shipment location or select an ID to modify an existing entry. The shipment location detail page has a list of all shipments sent out to that location.

Shipments [132]	ShippedBoxes [0]	Barcodes	ShippingLocations [31]
			Yale CRC

	Add	Edit	Delete
Id	2		
Is analytical Lab?	True		
Name	Yale CRC		
Primary contact	Christine Simpson		
Secondary contact			
Address	Yale Clinical Research Center		
Address (cont.)	330 Cedar Street, LMP 1091		
City	New Haven		
State	CT		
Zip	06510		
Phone	203-785-5452		
Country			
Analytes processed	IL-18		
Last modified	5/9/2013 6:36:56 PM		

Shipments

<u>Id</u>	<u>Date</u>	<u>Agency</u>	<u>Tracking</u>	<u>Contact</u>	<u>Boxes</u>	<u>Received</u>
<u>120</u>	8/25/2014 12:00:00 AM	Courier		Rowena 203-737-5022	7	False
<u>321</u>	7/9/2015 12:00:00 AM	Courier		203-737-5022	2	False

4.3 Shipment Report

From the shipment details page, click on “Print Report”, or “Export manifest” to obtain an excel file with the details.

Shipments [132] 445	ShippedBoxes [57]	Barcodes	ShippingLocations [31] UVM Laboratory for Clinical Biochemistry Research
Print Report Export manifest			
Add Edit Delete			
Id	445		
Shipment date	5/16/2016		
Received	False		
Study/Protocol	CAR - TRIBE Cardiac Surgery Study Show		
Destination	UVM Laboratory for Clinical Biochemistry Research Show		
Destination site	Attn: Elaine Cornell, Lab coordinator/		

A print ready page is then generated.

Id: 445
To: UVM Laboratory for Clinical Biochemistry Research
Attn: Attn: Elaine Cornell, Lab coordinator/
Address: UVM Department of Pathology and Laboratory Medicine 360 South Park Drive, Rm 223 Colchester VT 05446 USA
Shipped On: 5/16/2016 12:00:00 AM
Shipping agency: Fed-Ex Tracking Number:
Number of Boxes: 57 Total Samples: 4329
In case of problems with received samples, contact: 2037375022

Box: 1794 Vermont Pull Box 1 SampleTypes: Blood , Plasma ,

Ship Cnt	Box Cnt	Row	Col	Barcode	Parent	Patient ID	Timepoint	Sampletype	Sequence
1	1	B	1	252254		CAR-001-0002	Base	Plasma	
2	2	B	2	262039		CAR-001-0002	Day 1	Blood	
3	3	B	3	262094		CAR-001-0002	Day 2	Blood	
4	4	B	4	263625		CAR-001-0003	Base	Blood	
5	5	B	5	264888		CAR-001-0003	Day 1	Blood	
6	6	B	6	264942		CAR-001-0003	Day 2	Blood	
7	7	B	7	261496		CAR-001-0004	Base	Blood	
8	8	B	8	265426		CAR-001-0004	Day 1	Blood	
9	9	B	9	265480		CAR-001-0004	Day 2	Blood	
10	10	B	10	306970		CAR-001-0014	Base	Blood	
11	11	C	1	313081		CAR-001-0014	Day 1	Blood	
12	12	C	2	313135		CAR-001-0014	Day 2	Blood	
13	13	C	3	315384		CAR-001-0017	Base	Blood	
14	14	C	4	315404		CAR-001-0017	Day 1	Blood	

This manifest should be verified against the shipment contents by the receiving party.

5 Reports

Besides providing individual context-specific reports on the sections covered above, there is a report section that summarizes and provides links to them.

Reports.

Choose from the following list.

- Freezers
 - [Freezer Contents](#) : View number of samples, patient IDs, sampletypes, and comments by freezer. Export all barcode information within a freezer
 - [Empty locations](#) : View all available locations for samples in freezers.
 - [Reserved locations](#) : View all reserved locations in freezers.
 - [Location comments](#) : View all comments on freezer locations.
- Barcodes
 - Reports
 - [Barcode Status Report](#) : Master reports of all barcode information. Can sort by status (created, filled, etc.) and study.
 - [Filled samples](#) : Scanned "filled" barcodes.
 - [Consumed samples](#) : Barcodes that have been shipped, disposed or divided into daughter aliquots.
 - Batch Printing
 - [By Patient ID](#) : Print patient barcodes, using all or specific protocols.
 - [Daughter Aliquots](#) : Print daughter aliquots range for a specific study.
 - [By Barcode UID](#) : Print using a list of barcodes
- Samples
 - [Sample Location](#) : All barcodes by study, selected patients and protocols.
 - [Samples Available](#) : Number of available samples by study, selected patients and protocol.

5.1 Freezer Location

This links to the freezers main page where several reports (explained in the freezer section) can be selected.

5.1.1 Freezer Empty Locations

This report shows all available freezer locations where new boxes can be placed.

Freezers [22]	Locations
---------------	-----------

Report: Freezer Empty Locations(10/7/2016 9:11:33)				
List all available empty locations for new studies.				
Export				
	Freezer	Location	Rack	Slot
1	AUDI	1713	AA	15
2	AUDI	1714	AA	16
3	AUDI	812	BB	12
4	AUDI	814	BB	14
5	BEETLE	5820	A	1
6	BEETLE	5821	A	2
7	BEETLE	6467	G	6
8	BEETLE	6468	G	7

5.1.2 Freezer Reserved Locations

This shows all freezer locations that are reserved and cannot be used for storing new samples.

Freezers [22]

Locations

Report: Freezer Reserved Locations (10/7/2016 9:16:40 AM)

List of all freezer reserved locations.

Export

	Freezer	Location	Rack	Slot
1	BEETLE	5821	A	2
2	TAHOE	3714	A	2

5.1.3 Location Comments

This displays all the locations which have a comment attached, so that they are searchable.

Report: Location Comments (5/22/2017 9:36:22 AM)

List of all freezer location's comments.

Export

	Freezer	Location	Rack	Slot	Comment
1	BEETLE	5820	A	1	Somlo
2	TAHOE	3719	A	7	Klotho Plasma Daughter 6
3	TAHOE	3720	A	8	Klotho Plasma Daughter 6

5.2 Barcode Status Report

These reports allow you to print all barcodes for any given status, study, and/or date range of the barcode status. Use the pull down controls to select values for those parameters. These reports can either be printed or exported to a downloadable excel file.

Barcodes Reports

Status	-- All --	▼
Study	-- All --	▼
All Dates	<input type="checkbox"/>	
Date from	8/15/2016	
Date to	8/15/2016	
<input type="button" value="Show"/> <input type="button" value="Export"/>		

5.2.1 Scanned Samples (Barcodes Report)

This report uses the same form as the Barcodes Report, with a preselected status.

Barcodes Reports

Status	Filled	▼
Study	-- All --	▼
All Dates	<input type="checkbox"/>	
Date from	10/17/2016	
Date to	10/17/2016	
<input type="button" value="Show"/> <input type="button" value="Export"/>		

5.2.2 Consumed Samples (Barcodes Report)

This report uses the same form as the Barcodes Report, with a preselected status.

Barcodes Reports

Status	Consumed	▼
Study	-- All --	▼
All Dates	<input type="checkbox"/>	
Date from	10/7/2016	
Date to	10/7/2016	
<input type="button" value="Show"/> <input type="button" value="Export"/>		

5.3 Barcode Batch Printing

This report allows you to print a batch of barcodes for a given study. Select the patients and other characteristics of the barcodes you wish to print.

Barcode Batch Printing

Study	CAR
Paste Patient list	<div></div>
Select Patients	<div>CAR-001-0001 CAR-001-0002 CAR-001-0003 CAR-001-0004 CAR-001-0005 CAR-001-0006 CAR-001-0007 CAR-001-0008 CAR-001-0009 CAR-001-0010 CAR-001-0011 CAR-001-0012 CAR-001-0013 CAR-001-0014 CAR-001-0015 CAR-001-0016 CAR-001-0017 CAR-001-0018 CAR-001-0019 CAR-001-0020</div>
All Protocol	<input type="checkbox"/>
Timepoint - Sampletype	<div>Base - Blood Base - DNA Base - EmptyTube Base - Urine Dy1 0-6hr - Blood Dy1 0-6hr - Urine</div>
Aliquot numbers	<div></div>
Output	Standard Labels ▾
<div>Submit</div>	

5.4 Daughter Aliquot Printout

This report prints only daughter aliquots for either a given set of parents and/or a barcode range. Enter parent barcode(s):

Daughter Aliquot - Barcode Printing

Study	DDS
Paste Parent barcode(s) list	<div></div>
Parent barcode(s)	<div>x 10005213 DDS-03-0261 Base-3 - Urine - 3 s</div> <div>x 10004743 DDS-03-0258 Base-3 - Urine - 3 s</div>
From daughter barcode	<div></div>
To daughter barcode:	<div></div>
Aliquot numbers	<div></div>
label size	Standard ▾
	<div>Submit</div>

And then we get (8) daughter samples:

<div>120001624</div>  <div>DDS-03-0258</div> <div>5</div> <div>Urine DAliq.1 Base-3</div>	<div>120001625</div>  <div>DDS-03-0258</div> <div>5</div> <div>Urine DAliq.2 Base-3</div>	<div>120001626</div>  <div>DDS-03-0258</div> <div>5</div> <div>Urine DAliq.3 Base-3</div>	<div>120005530</div>  <div>DDS-03-0261</div> <div>5</div> <div>Urine DAliq.1 Base-3</div>	<div>120005531</div>  <div>DDS-03-0261</div> <div>5</div> <div>Urine DAliq.2 Base-3</div>
<div>120005532</div>  <div>DDS-03-0261</div> <div>5</div> <div>Urine DAliq.3 Base-3</div>	<div>120005533</div>  <div>DDS-03-0261</div> <div>5</div> <div>Urine DAliq.4 Base-3</div>	<div>120005534</div>  <div>DDS-03-0261</div> <div>5</div> <div>Urine DAliq.5 Base-3</div>		

You may also paste parent barcodes separated by hard returns in the appropriate box instead of scanning each. Additionally, you may specify which aliquot you want in "Aliquot numbers," and separate them by commas. The final option is to print labels in the smaller format which fit on Eppendorf tubes.

If you add a range filter:

Daughter Aliquot - Barcode Printing

Study	DDS
Parent barcode(s)	x 10005213 DDS-03-0261 Base-3 - Urine - 3 s x 10004743 DDS-03-0258 Base-3 - Urine - 3 s
From barcode	x 120001626 DDS-03-0258 Base-3 - Urine - 3 Created
To barcode:	x 120005533 DDS-03-0261 Base-3 - Urine - 4 Shipped
<input type="button" value="Submit"/>	

You get a subset.

 120001626 DDS-03-0258 5 Urine DAliq.3 Base-3	 120005530 DDS-03-0261 5 Urine DAliq.1 Base-3	 120005531 DDS-03-0261 5 Urine DAliq.2 Base-3	 120005532 DDS-03-0261 5 Urine DAliq.3 Base-3	 120005533 DDS-03-0261 5 Urine DAliq.4 Base-3
--	--	--	---	--

To use a Barcode From - Barcode To, we do not need a range filter.

5.5 Print Barcodes by UID

If you know which barcodes you need to print by UID, you can use this module which will allow you to paste a list of UIDs separated by hard returns.

Barcode List Printing

Barcode list	<div></div>
label size	Standard ▼
<input type="button" value="Submit"/>	

5.6 Sample Locations

This report presents all sample freezer locations for one or more patients. Upon opening the report, select the study.

Patient samples location report - Select Study

Study	AAA ▼
<input type="button" value="Submit"/>	

The next form allows you to select one or more patients.

Patient Samples Freezer-Locations Report

Study	ACC
Patients	<div>ACC-01-0001 ▲ ACC-01-0002 ACC-01-0003 ACC-01-0004 ACC-01-0005 ACC-01-100008 ACC-01-100010 ACC-01-100016 ACC-01-100026 ACC-01-100030 ACC-01-100048 ACC-01-100066 ACC-01-100075 ACC-01-100079 ACC-01-100090 ACC-01-100113 ACC-01-100116 ACC-01-100136 ACC-01-100164 ACC-01-100165 ▼</div>
All Protocol	<input type="checkbox"/>
Timepoint - Samplettype	<div>Base - Serum ▲ Base - Urine M24 - Serum M24 - Urine ▼</div>
<div><input type="button" value="Show"/> <input type="button" value="Export"/></div>	

By default, all protocols (timepoints and sampletypes) are displayed to be selected individually. Selecting “All protocol” collapses the protocol definition to include all options.

You may view the list by pressing “Show” or export to Excel.

After selecting some entries and pressing “Show”, we get two lists: a “Results” list, and a “Selected Barcodes Cart” list.

Patient Samples Freezer-Locations Report

Study: ACC

Patients: ACC-01-0001, ACC-01-0002, ACC-01-0003, ACC-01-0004, ACC-01-0005, ACC-01-100008, ACC-01-100010, ACC-01-100016, ACC-01-100026, ACC-01-100030, ACC-01-100048, ACC-01-100066, ACC-01-100075, ACC-01-100079, ACC-01-100090, ACC-01-100113, ACC-01-100116, ACC-01-100136, ACC-01-100164, ACC-01-100165

All Protocol: ☐

Timepoint - Sampletype: Base - Serum, Base - Urine, M24 - Serum, M24 - Urine

Show Export

Results

Barcode	Parent	Patient	Timepoint	SampleType	AliqSN	Freezer	Location	Rack	Slot	Row	Col	Status	Date	User
<input checked="" type="checkbox"/> 200000897	120036351	ACC-01-100008	Base	Urine	1	IVY	5345	D	1	E	7	9/24/2014 12:33:39 PM		
<input checked="" type="checkbox"/> 200000898	120036351	ACC-01-100008	Base	Urine	2	IVY	5346	D	2	E	7	9/24/2014 12:39:05 PM		
<input type="checkbox"/> 200000899	120036351	ACC-01-100008	Base	Urine	3	IVY	5347	D	3	E	7	9/24/2014 12:54:51 PM		
<input type="checkbox"/> 200000900	120036351	ACC-01-100008	Base	Urine	4	IVY	5348	D	4	E	7	9/24/2014 1:25:23 PM		
<input checked="" type="checkbox"/> 200000901	120036351	ACC-01-100008	Base	Urine	5	IVY	5349	D	5	E	7	9/24/2014 1:18:36 PM		
<input type="checkbox"/> 200000902	120036351	ACC-01-100008	Base	Urine	6	IVY	5350	D	6	E	7	9/24/2014 1:33:45 PM		

Add to Cart

Selected Barcodes Cart

Barcode	Parent	Patient	Freezer	Location	Rack	Slot	Row	Col	Timepoint	SampleType	AliqSN	Status	Date	User
Empty														

Questions, comments, problems? Email the project administrator.

From the Results list we can select one or more barcodes and press “Add to Cart.”

Selected Barcodes Cart

Barcode	Parent	Patient	Freezer	Location	Rack	Slot	Row	Col	Timepoint	SampleType	AliqSN	Status	Date	User
<input type="checkbox"/> 200000897	120036351	ACC-01-100008	IVY	5345	D	1	E	7	Base	Urine	1	9/24/2014 12:33:39 PM		
<input type="checkbox"/> 200000898	120036351	ACC-01-100008	IVY	5346	D	2	E	7	Base	Urine	2	9/24/2014 12:39:05 PM		
<input type="checkbox"/> 200000901	120036351	ACC-01-100008	IVY	5349	D	5	E	7	Base	Urine	5	9/24/2014 1:18:36 PM		

Remove Selected Clear All Export

After items have been added to the Cart, new controls will be available to remove specific barcodes, clear the cart, or export the list. Items saved in the Cart are kept until they are deleted—even if a user logs out of the session.

5.7 Samples Available

Provides a summary of samples available in a study, by patient and Timepoint / Sample type.

Samples Available Report - Select Study

Study	ACC ▼
<input type="button" value="Submit"/>	

On the first screen, select a study. On the next, select study-patients and protocols. A list of available samples is produced per patient and protocol with the number of available parent and daughter samples displayed as well.

Samples Available Report - Report

Study	ACC
Patients	<div>ACC-01-0001 ▲ ACC-01-0002 ACC-01-0003 ACC-01-0004 ACC-01-0005 ACC-01-100008 ACC-01-100010 ACC-01-100016 ACC-01-100026 ACC-01-100030 ACC-01-100048 ACC-01-100066 ACC-01-100075 ACC-01-100079 ACC-01-100090 ACC-01-100113 ACC-01-100116 ACC-01-100136 ACC-01-100164 ACC-01-100165 ▼</div>
All Protocol	<input checked="" type="checkbox"/>
<input type="button" value="Show"/> <input type="button" value="Export"/>	

Available Samples

Study	Patient	Timepoint	SampleType	Parent	Daughter
ACC	ACC-01-100008	Base	Serum	1	0
ACC	ACC-01-100008	Base	Urine	0	6
ACC	ACC-01-100008	M24	Serum	1	0
ACC	ACC-01-100008	M24	Urine	0	3

6 Configuration

This section allows you to maintain system users and other data categories.

[Home](#) [Studies](#) [Shipments](#) [Freezers](#) [Reports](#) [Configuration](#) [Help](#)

Configuration:

Select:

- Security
 - [Users](#) : Maintain system's users
- Other data categories in the system
 - [Sample types](#) : See and maintain Sample types information
 - [Study Status](#) : Show study status
 - [Barcode Status](#) : Show barcode status
- Other types of information:
 - [Orphan Shipped boxes](#) : Boxes without shipment information

6.1 Users

If logged in as a System Administrator, you are allowed to maintain user rights.

Users List

[Register new account](#)

Id	Email	Role	Studies		
7	mailto:thierry@paleo-ids.org	System Administrator		Edit	Reset Password
8	mailto:jean@paleo-ids.org	System Administrator		Edit	Reset Password
5	mailto:marcel@paleo-ids.org	Study Administrator		Edit	Reset Password
3	mailto:valérie@paleo-ids.org	System Administrator		Edit	Reset Password
1	mailto:marion@paleo-ids.org	Study Administrator		Edit	Reset Password
2	mailto:marion@paleo-ids.org	System Administrator		Edit	Reset Password
4	mailto:marion@paleo-ids.org	Navigator		Edit	Reset Password
6	mailto:jean@paleo-ids.org	Study Administrator		Edit	Reset Password

6.1.1 Changing User Roles

Click on “Edit” for a given user to modify their rights. A single role can be given to each user. That role (previously explained in the overview section) can be applied to specific studies.

Edit User

Back to [Users](#)

UpdateDelete

User:

test.user@proteomics.com

Role

☐ System Administrator

☒ Study Administrator

☐ Data Collector

☐ Navigator

Studies

☒ A11 Sample Study

☐ AAA

☒ ACC Accord, urines and serum from multiple analyses

☐ AIN This is the second study arm for the proteomics protocol. HIC 1111009286. Arm 1

☐ APK No patients collected

☒ BBS Batch Bias Study

☐ BIF Blood FeNA

☐ BSH Biomarker Sample Handling

☐ CAR TRIBE Cardiac Surgery Study

☐ CKM ???

☐ CTR Generating QC plasma samples from healthy Proteomics controls (fresh samples) a

After the changes are made, they are presented in the user list. Unselecting studies or changing the user role to navigator will limit the user from performing changes to the system.

Users List

[Register new account](#)

Id Email		Role	Studies		
7	test.user@proteomics.com	System Administrator		Edit	Reset Password
8	test.user@proteomics.com	System Administrator		Edit	Reset Password
5	test.user@proteomics.com	Study Administrator		Edit	Reset Password
3	test.user@proteomics.com	System Administrator		Edit	Reset Password
1	test.user@proteomics.com	Study Administrator	3	Edit	Reset Password
2	test.user@proteomics.com	System Administrator		Edit	Reset Password
4	test.user@proteomics.com	Navigator		Edit	Reset Password
6	test.user@proteomics.com	Study Administrator		Edit	Reset Password

6.2 Sample Types

SIDS manages a centralized list of sample types (or specimens). That list is accessible from the Configuration page section.

Sampletype List					New
Id	Name	Description	Units	Color	
1	Blood		uL		
2	DNA		uL		
3	EDTA Plasma		uL		
4	EmptyTube		uL		
5	ExtraPlasma		uL		
6	ExtraSerum		uL		
7	ExtraUrine		uL		
8	LIHep Plasma		uL		
9	Lymph Node	Lymph node tissue from biopsy	mg		
10	Oxalate Plasma		uL		
11	PBMC		uL		
12	PE Cytokine		uL		
13	PerfusateB		uL		
14	PerfusateL		uL		
15	PerfusateR		uL		
16	Plasma		uL		
17	Renal Biopsy	Renal Tissue-Core	mg		
18	RNASE Biopsy	Renal Tissue Treated with Rnase	mg		
19	Serum		uL		
20	Urine		uL		
21	Urine Pellet	For use in microscopy	uL		
22	Specimen slide				

Clicking on “New” will add a new sampletype. Selecting an ID will show the sampletype details. Clicking “Edit” will allow the administrator to change information about the sampletype, including which color they can be highlighted by in freezer reports.

		Add	Edit	Delete
Id	8			
Name	Lymph Node			
Description	Lymph node tissue from biopsy			
Units	mg			
Color				

Sample types information can be changed but this is not recommended when in used in a study protocols. Additionally, sample types cannot be deleted if they are being used in protocols.

6.3 Study Status

This information is read-only as reference for the user.

Home Studies Shipments Freezers Reports Configuration Help				
Study Status List				
Seq.	Id	Name	Description	Color
1	d	Design	During study creation. It will allow to define the study protocol: Adding sites, timepoints and timepoint-sampletypes. But not adding patients. Number of patients should remain zero	red
2	r	Recruit	Only adding Patients, and Barcode changes.	green
3	s	Store	Just Barcode changes allowed	blue
4	l	Locked	No changes allowed to the Study.	grey

6.4 Barcode Status

This information is also offered as reference for the user.

Barcode Status List				
Id	Previous	Sequence	Name	Description
<u>?</u>		1	Unknown	Undetermined status
<u>c</u>		2	Created	Generated by the system. Pending collection
<u>f</u>	c	3	Filled	Sample was collected and should be located in a freezer box
<u>e</u>	f	4	Consumed	Used by the lab
<u>u</u>	c	5	Unused	Sample was not collected
<u>s</u>	f	6	Shipped	Aliquot was shipped out
<u>d</u>	f	8	Disposed	Aliquot has been disposed/destroyed

6.5 Orphan Shipment Boxes

This report will list boxes without shipment information.

6.6 System Checks

These reports provide information on boxes which do not fit the rules which apply to any new samples added in SIMS. Some older boxes which were imported into SIMS do not follow the same rules as in SIMS.

System Checks

[Back to check lists](#)

System Health

Check different integrity tests below.

Boxes with more than one sampletype:	133	Show
Boxes with wrong SampleType:		
Boxes with wrong Study:		
Boxes with more than 100 samples:	1	Show

7 System Architecture

7.1 System Design

SIMS is built as an internet application, using a Website and a backend relational database. The Website was created using the Microsoft .NET framework. It is written in C# language interpreted inside a razor engine. Database connectivity is done via the Entity Framework. Front end uses HTML5, DHTML via Javascript, JQuery and JSON. The Web application is hosted on Internet Information Services (IIS). As backend database SIMS uses a SQL server 2016 database system. The whole system can be hosted in a single Windows 2016 or 2102 R2, or in separated systems for database and web hosting. SIMS leverages the EvSol library for Evolvable Solutions for user interaction through web forms.

7.2 Computing Requirements

We recommend a Windows 2016 system virtual or physical with 2 CPU cores, and depending on the size of the database and expected growth; at least 20GB of free space for data.

7.3 Installation and Setup

We provide instructions to setup a single system deployment. Please make the necessary adjustments for a split system deployment.

Following are the instructions we recommend in our systems. You can modify the location of the files to match your institution/department guidelines if you understand the implications of the changes.

7.3.1.1 Installation

- Install IIS
- Install SQL server
- Create root system folder C:\Applications\SIMS
- Create Web folder C:\Applications\SIMS**Web**
- Create Database folder C:\Applications\SIMS**Data**

7.3.1.2 System Setup

- Website:
- ...