Appendix A Release 2.7

Note: This Document may change slightly, and will be accompanied by snapshots providing an indication to real changes to the look of the system where applicable.

List of Primary Changes

(new functionality or large scale changes visible to the end user)

• Added shipping manifold for exporting plates or generating freezer content reports (with options to dump to an excel spreadsheet and/or include a full sample list)

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Printable Page (extracts only this table)

Shipping Manifold

<u>Date</u>: 2009-07-06 11:03:20 <u>Shipper</u>: LabAdmin

To: From:

BC Generations Project
2775 Laurel St.,
BC Generations Project
7.208 - 675 West 10th Ave,

Vancouver, BC Vancouver, BC V5Z 1M9 V5Z 1L3

Content Summary

Type: Human Blood Specimens

Subject Records: 22

First Subject: BC000110

Last Subject: BC000348

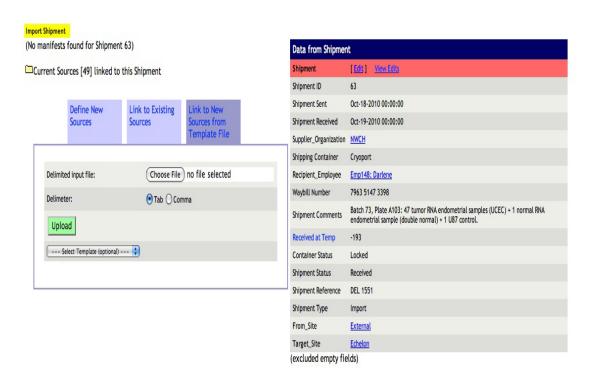
Sample_Type	Samples_per_Subject	Samples	Total_Volume_in_mL		
Blood Plasma	8.18	180	720		
Blood Serum	5.45	120	0.36		
Red Blood Cells	2.73	60	240		
Urine	3.00	66	264		
White Blood Cells	2.73	60	240		
Whole Blood	2.73	60	0.18		
Totals (6 Records)	24.82	546.00	1464.54		

- Added detailed tracking of Shipments received from collaborators / other groups or exports
- Added tracking of Shipments including logging of manifests for both SRC and PLA records and separate shipping records for each object shipped



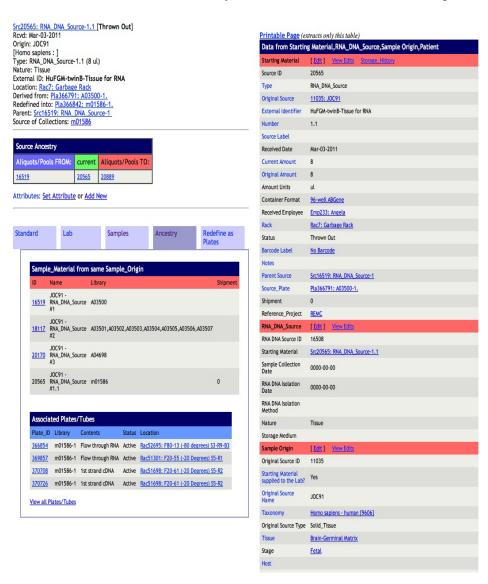
					Import	Internal	Export					
	e Page (extract Samples	s only this	table)									
Shipment	Shipment_Type	Supplier	Shipment_Sent	Shipment_Received	BCR_Batch	Plates		Sources	Specimens	First_Sample	Last_Sample	<u>Tissues</u>
1	Import	<u>IGC</u>	2010-02-22 00:00:00	2010-02-23 00:00:00	29	0827		7	7	TCGA_1	TCGA_8	Large Intestine-Colon
2	Import	<u>IGC</u>	2010-02-22 00:00:00	2010-02-23 00:00:00	28	0822		31	31	TCGA_18	TCGA_62	Large Intestine-Colon
3	Import	NWCH	2010-02-23 00:00:00	2010-02-24 00:00:00	30	A001		15	15	TCGA_66	TCGA_88	Large Intestine-Colon
4	Import	<u>IGC</u>	2010-03-17 00:00:00	2010-03-18 00:00:00	32	0860		41	41	TCGA_100	TCGA_99	Kidney
<u> </u>	Import	NWCH	2010-03-08 00:00:00	2010-03-09 00:00:00	33	A009		17	17	TCGA_130	TCGA_155	Large Intestine-Colon
<u>6</u>	Import	<u>IGC</u>	2010-04-14 00:00:00	2010-04-15 00:00:00	36	0906		33	33	TCGA_156	TCGA_195	Large Intestine-Colon
7	Import	<u>IGC</u>	2010-04-21 00:00:00	2010-04-22 00:00:00	37	0947		21	21	TCGA_197	TCGA_217	Lung
3	Import	IGC	2010-02-22 00:00:00	2010-02-23 00:00:00	42	0827		10	10	TCGA_11	TCGA_9	Large Intestine-Rectum
9	Import	<u>IGC</u>	2010-05-05 00:00:00	2010-05-05 00:00:00	42	0822		16	16	TCGA_22	TCGA_64	Large Intestine-Rectum
10	Import	<u>IGC</u>	2010-04-14 00:00:00	2010-04-15 00:00:00	42	0906		8	8	TCGA_161	TCGA_196	Large Intestine-Rectum
<u>11</u>	Import	<u>IGC</u>	2010-05-05 00:00:00	2010-05-06 00:00:00	39	0981		41	41	TCGA_218	TCGA_258	Lung
12	Import	NWCH	2010-05-06 00:00:00	2010-05-06 00:00:00	43	A001,A00	09	18	18	TCGA_133	TCGA_85	Large Intestine-Rectum
<u>13</u>	Import	NWCH	2010-05-05 00:00:00	2010-05-06 00:00:00		BC Valida	ation	34	34	TCGA_259	TCGA_292	Ovary, Large Intestine-Colon, Large Intestin Rectum, Brain, Blood-Peripheral-Leukocytes Lymphocytes-B Cells

 Added Shipment home page to view all details including content and upload information



Appendix A

• Refactored source home page for one or many sources. Added more details such as ancestry and more actions that can now be preformed



• Added Employee Submission/Group Permission functionality for lab admins



User Emp221: Adrian belongs to:

- · Gene Expression Production
- Gene Expression SAGE
- Microarray
- Receiving

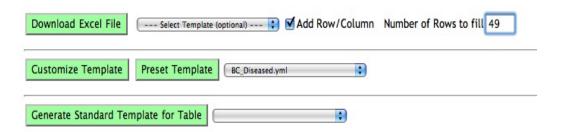
Select Groups

```
Aly Karsan Lab
Bioinformatics
BioInformatics Admin
BioSpecimens Core
BioSpecimens Core Admin
Brain Research
Cancer Genetics
Engineering
External
FG TechD
FG TechD Admin
Gastrointestinal Cancer (GI)
GE SAGE Admin
Gene Expression
Gene Expression Admin
Gene Expression Production
Gene Expression Project Admin
Gene Expression SAGE
Genomics
LIMS Admin
Mapping
Mapping Admin
Mapping Bioinformatics
Mapping Production
Mapping Project Admin
Mapping TechD
Marra
MGC_Closure
MGC_Closure Admin
MGC_TechD
Microarray
Microarray Admin
Programmed Cell Death (PCD)
Projects_Admin
Prostate
Prostate Lab
Prostate Lab Admin
Proteomics
QC
Randy Gascoyne Lab
Receiving
Sequencing
Sequencing Admin
Sequencing Bioinformatics
Sequencing Production
Sequencing Project Admin
Sequencing TechD
Systems
TCGA
Vectorology
```

Set Employee Groups

Reset

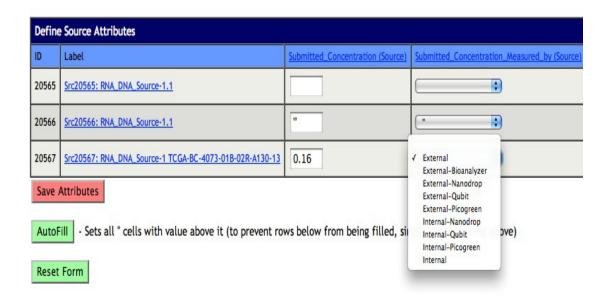
- Refactored Tissue, Histology information for Original Sources to enforce structured vocabulary and help ensure key information is tracked for all incoming samples.
- Added new functionality to download and preset standards templates into excel files



• Added upload and mapping of data directly from excel files



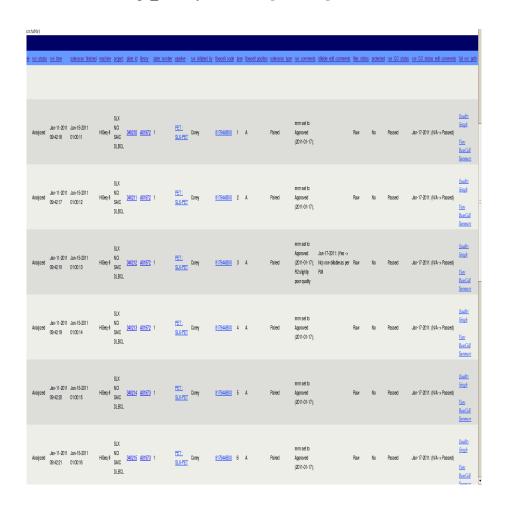
• Improved attribute functionality to use lookup tables and enums. Also improved editing and duplicate issues (also in protocols)



- Improved Rack home page
- Added minimum standards for user passwords
- Enhanced view module to enable more powerful generation of customized reports
- · Added basic graphing functionality to query and views
- Added Patient tracking
- Added capability of tracking information specific to xenograft samples
- Added Run_Analysis, an automated analysis framework to standardize
 analysis for different types of runs/analyses. For each individual step of
 an analysis, information such as start/finish or which software version is
 used is tracked. Both the BWA alignment and BioScope alignment
 pipeline run under Run_Analysis for this release.
- Added Multiplex_Run_Analysis to track the index and sample info of a pooled samples run

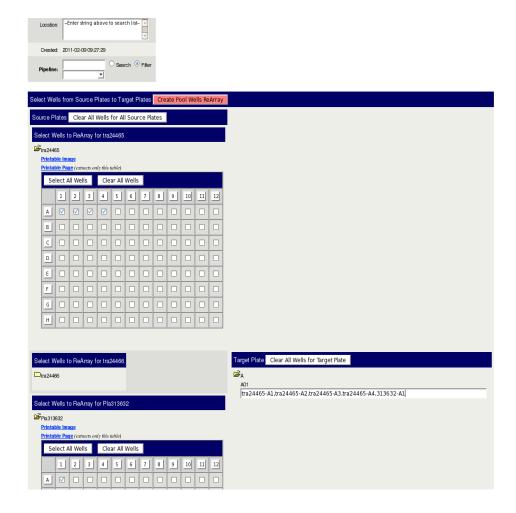
- Added API support for the new Run_Analysis and Multiplex Run Analysis tracking [hotfixed]
- Added Queueing system for managing Illumina scheduling priorities [hotfixed]
- Automated validation of Primers based upon Vector Sequences (removing need for admins to do this, and enabling instant access to all 'valid' primers)
- Added distinct Department Tab for QC group [hotfixed]
- Added QC_Batch functionality to track batches of items for QC'ing (including report pages and history views) [hotfixed]

• Added ability to add and display edit changes for any fields that Change History is tracked [hotfixed]



 Added Adapter_Index_Sequence tracking in database to track the index used in index pooling [hotfixed]

- Added ability to create tray of tubes and ability to use tray of tubes to go through protocol and maintain as tray of tubes [hotfixed]
- Added ability to aliquot tube and existing tray into a new tray [hotfixed]
- Added capability for primer plate to be able to apply to tray of tubes [hotfixed]
- Added interface and ability to create sample pool rearrays using, library plates, tubes, or trays [hotfixed]



 Added interface for batch pool rearray of the same rearray specification [hotfixed]

- Added checking for duplicate index when creating a sample poor rearray [hotfixed]
- Added API support to retrieve the index used for a pool [hotfixed]
- Enabled standard chemistry calculator's parameters to be set as formula [hotfixed]

Brew Volume = BrewVolume, DNA_volume = DNA

Eg: Brew Volume = 34.77 ul = 34.77 ul DNA_volume = 15.23 ul = 15.23 ul.

Add Parameter

Index96 LigateAd	apter Definitions	Index96 LigateAdapter Parameters										
	ndard_Solution [Ecit]		Description	Prompt	Value	Units	Format	Reagent	Parameter			
Name	Index96_LigateAdapter	Name			100		Tomat	Туре	Туре			
	((A*TV)*Wells)+(((A*TV)*(DV/TV)*(TV/(TV- DNA))*BrewSourceWells))+(((A*TV)*Wells)+	<u>A1</u>	5X Quick Ligase Buffer	5X Quick Ligase Buffer	.2	ul	0		Multiple			
Formula	(((A*TV)*(DV/TV)*(TV/(TV- DNA))*BrewSourceWells)))*(CV/100)	<u>A2</u>	Quick T4 DNA Ligase 2000eau/uL	Quick T4 DNA Ligase 2000eau/uL	0.134	ul	0		Multiple			
Parameters	4	<u>A3</u>	PE Adapter 1uM 1pmol/uL X1uL = 1pmoles	PE Adapter 1uM	.02	ul			Multiple			
Message	Brew Volume = BrewVolume, DNA_volume = DNA	<u>A4</u>	Ultrapure dH2O	Ultrapure dH2O	(TV-DNA-(A1+A2+A3)*TV)/TV	ul	0		Multiple			
Status Standard Solution ID	Active 297	BrewSourceWells	Brew Source Wells 12 or 96 wells	BrewSourceWells	12		0		User_Defir			
Prompt_Units		BrewVolume	Brew Volume	BV	TV-DNA	ul	0		Static			
Reagent Parameter	A	CV	%CV	CV	10		0		Static			
Label Type Barcode Label	ZPL 0	DNA	DNA dA-Tailed	DNA	DNApmoles/((DNAconc*1000) /(DNAbp*660))	ul	0		Static			
excluded empty fi	elds)	DNAbp	DNA template length (base pairs)	DNA_bp	300		0		User_Defi			
		DNAconc	DNA concentration by Picogreen (ng/uL)	DNA Picogreen ng/uL	1.3		0		User_Defin			
		<u>DNApmoles</u>	pmoles DNA in iPCR rxn. Aim for 0.1 pmoles for 10:1 iAdapter:DNA ratio	DNA_pmoles	0.1		0		Static			
		DV	DeadVolume/Well	DV	5	ul	0		Static			

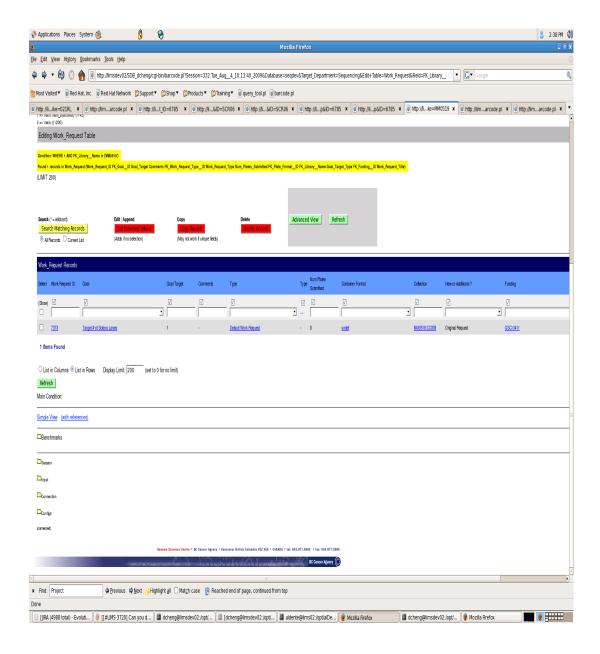
Minor Changes

(improvements to existing core functionality visible to the end user)

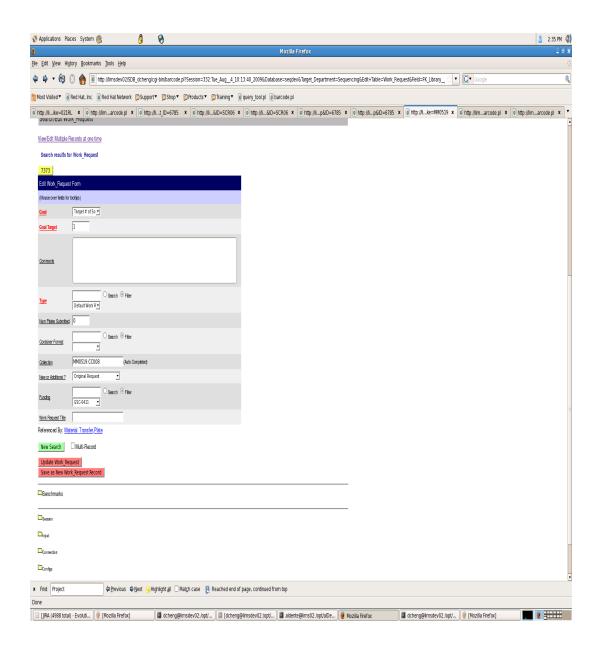
- Add ability to Transfer/Aliquot samples 'out' to a new container without shifting focus from current containers.
- Adjust Split function to prompt for split number for **each** container. (ie if splitting 8 tubes into 16, users specify **Split each container into: 2** rather than (previously) 'Split into: 16'). This is more intuitive and removes the chance of 'invalid' numbers being chosen. (hotfixed)
- Prompt enabling users to change the Pipeline during a transfer step within a protocol will only appear if multiple applicable Pipelines include the current Lab Protocol
- Enable movement of items into multiple boxes at one time (<items for box 1><box 1><items for box 2><box 2> ... etc)
- Added functionality to move contents of two racks of the same type by scanning them together
- Enable loading of slots in boxes in ascending or descending order for columns and/or rows.
- Enabled user to pick the type of label to print when re-printing source barcodes.
- Enable bulk sample redistribution across boxes (enabling users to scan N boxes and extract all samples of a particular type into one or more target boxes)
- Smarter sample relocation into slotted boxes. Confirmation step autofills target slots (by row or column; asc or desc order), and providing feedback wrt first slot used, last slot used & occupied slots that were skipped.

• When only editing a single record that went through the multi-page edit form, it will now go to the single page edit form by default.

Before:

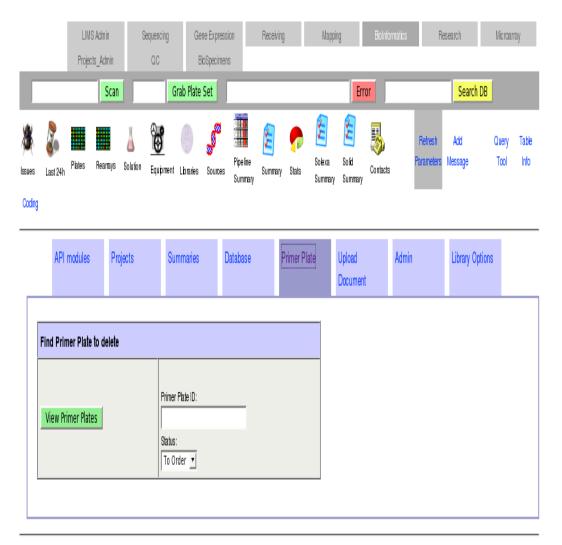


After:



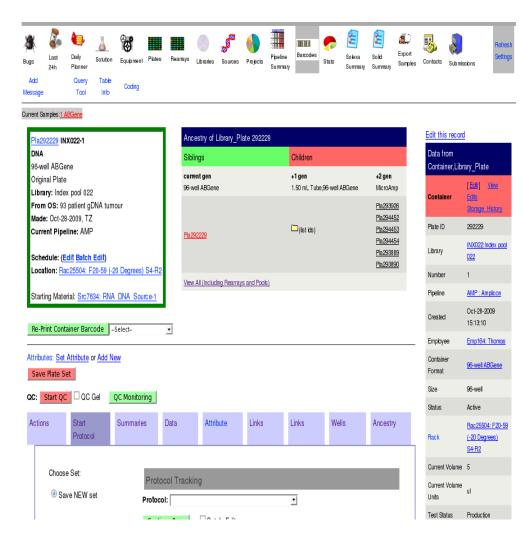
 More transparent ancestry information supplied on main pages for Library, Original Source, Source records

- Improved get_Primer_data API to figure out tube/plate primer on its own [hotfixed]
- Added get_bcr_data to API [hotfixed]
- Added interface for Bioinformatics to delete the primer plate that they order themselves [hotfixed]



• Allowed lab admins to delete plates with prep records [hotfixed]

• For library_plate that's involved in a rearray, a link will show up to give the option to view all plates in the ancestry box



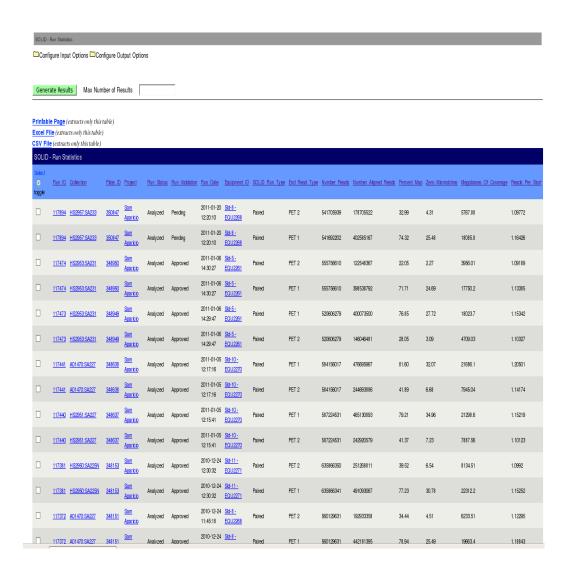
- Views grouped by visibility (Public, Employee, Group, Other)
- The auto-complete field changed from a single value selection into a dropdown box with multiple value selection
- View's output options can contain a group by checkbox
- View's input options can contain attribute search fields

Group Specific Improvements

(Changes applicable only to specific groups)

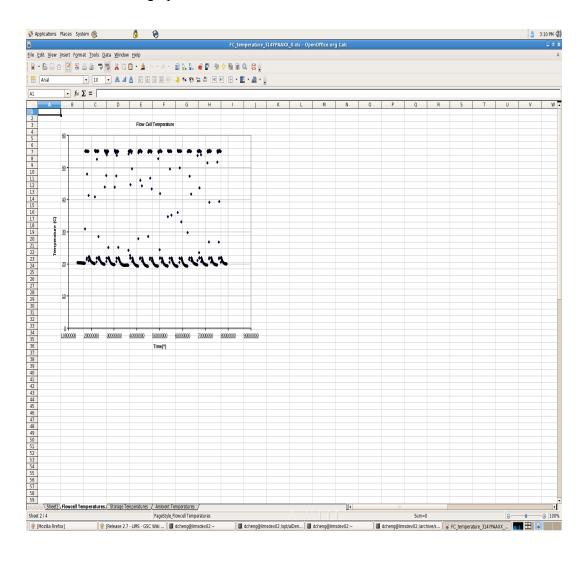
- Added plugin for SOLID run analysis along with views to monitor SOLID data
- Added automate checking and linking of data directory to individual solid runs
- Added support for BioScope analysis pipeline for solid runs. The pipeline
 is completely automated using Run_Analysis. Support single end
 fragment solid runs, pair end fragment solid runs and miRNA barcode
 solid runs.
- Steps for single end fragment pipeline: SOLID-4, BioScope-1.2.1 Mapping, BioScope-1.2.1 Mapping Small Indel Frag, BioScope-1.2.1 MaToBam, BioScope-1.2.1 Position Error, SOLID Rsync Analysis Result
- Steps for pair end pipeline: SOLID-4, BioScope-1.2.1 Pair End Mapping, BioScope-1.2.1 Pair End Pairing, BioScope-1.2.1 Pair End Position Error, SOLID Rsync Analysis Result
- Steps for miRNA barcode pipeline: SOLID-4, SOLID Replace First Base, SOLID Adapter Trim, BioScope-1.2.1 Mirna Barcode Mapping, BioScope-1.2.1 Mirna Barcode MaToBam, SOLID Rsync Analysis Result

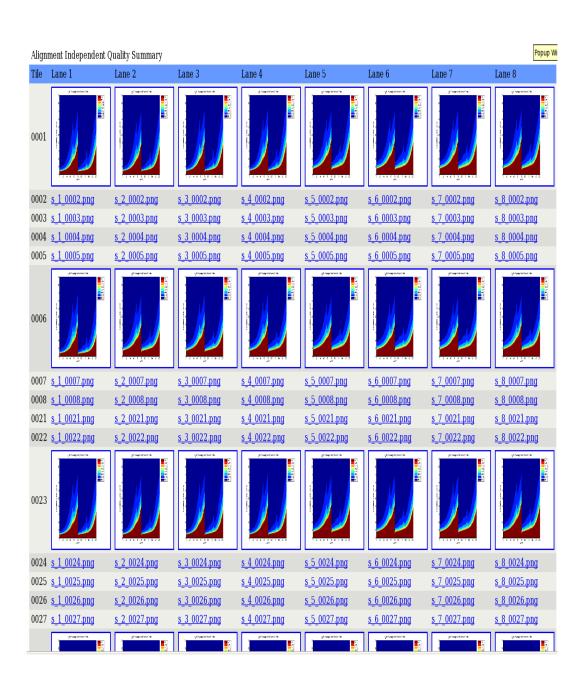
• The alignment stats are stored in database and immediately available in "SOLID - Run Statistics" view after an analysis finishes



- Automated data compression for SOLID data after alignment is done
- Added email notifications for imaging stalls, not enough panel analyzed, and bioscope errors

- Added SOLID Ready for emulsion PCR view and SOLID Libraries Ready for Sequencing view for SOLID runs scheduling [hotfixed]
- Added get_SOLID_run_data API support for Bioinformatics [hotfixed]
- Added plugin for LS_454 data (to enable tracking of externally generated data of this format)
- Automated the process to generate flowcell temperature plot and quality graph.





• Automated the process to generate basecall summary

819P2	2ABXX	Base Calling S	Summary											
Lane Base Calling Results														
Lane	Read	Lane Yield (F	(B) Raw Clus	ters (per tile)	PF Clusters (p	er tile)	PF Ch	ısters Percen	t 1st Cycle I	nt (PF)	% inter	nsity after 20 cycles (PF)	Phasing	Prephasing
1	1	3257856	1078178		1008000		93.48		1023 +/- 8	8	86.18 +	-/- 1.65	0.5357	0.3461
1	2	3257856	1078178		1008000		93.48		761 +/- 67		86.51 +	-/- 1.53	0.2691	0.3396
2	1	4036800	1372213		1249010		91.36		1074 +/- 1	01	86.17 +	·/- 0.99	0.5382	0.3228
2	2	4036800	1372213		1249010		91.36		803 +/- 79		85.73 +	-/- 1.42	0.2652	0.3270
3	1	3848949	1299377		1190887		91.93		1071 +/- 9	ō	86.17 +	-/- 1.1 7	0.5454	0.3240
3	2	3848949	1299377		1190887		91.93		803 +/- 68		84.98 +	-/- 5.21	0.2703	0.3230
4	1	3969561	1349524		1228205		91.32		1061 +/- 9	7	85.72	-/- 1.47	0.5431	0.3384
4	2	3969561	1349524		1228205		91.32		799 +/- 72		85.40 +	-/- 1.68	0.2669	0.3478
5	1	6200777	2185063		1918557		87.90		1109 +/- 9	7	85.45 +	-/- 1.04	0.5131	0.3096
5	2	6200777	2185063		1918557		87.90		817 +/- 72		85.48 +	-/- 1.28	0.2556	0.3204
6	1	6242210	2183827		1931377		88.53		1075 +/- 1	03	85.79 +		0.5133	0.3043
6	2	6242210	2183827		1931377		88.53		804 +/- 77		85.08 +	-/- 1.54	0.2525	0.3021
7	1	6169310	2163025		1908821		88.34		1096 +/- 1	04	85.66 +	-/- 1.12	0.5127	0.2975
7	2	6169310	2163025		1908821		88.34		822 +/- 84		85.29	·/- 1.83	0.2526	0.2859
8	1	6307425	2213786		1951555		88.24		1068 +/- 1	12	85.71 +	·/- 1.09	0.5090	0.3250
8	2	6307425	2213786		1951555		88.24		798 +/- 82		85.38 +	-/- 1.71	0.2523	0.3207
<u>IVC</u>														
<u>All</u>														
Raw	Results	5												
Lane	Read	Lane Mean	Lane Std Dev	Lane Mediar	Q20 Bases	Q20 Pe	ercent	Q30 Bases	Q30 Percent	Total	Bases			
1	1	31.80	1.55	37.00	2989564667	85.79		2797785747	80.29	34846	574225			
1	2	32.73	1.13	39.00	3126144984	89.71		2975041111	85.38	34846	574225			
2	1	30.96	1.37	37.00	3703703010	83.51		3452924713	77.86	44349	94537			
2	2	31.80	1.00	38.00	3864138253	87.13		3647790503	82.25	44349	94537			
3	1	31.08	1.48	37.00	3521368487	83.85		3283767590	78.19	41995	87272			
3	2	31.90	1.11	38.00	3668421351	87.35		3465458683	82.52	41995	87272			
4	1	30.81	1.54	37.00	3628489235	83.19		3376150926	77.41	43616	63285			
4	2	31.67	1.14	38.00	3790973196	86.92		3575256437	81.97	43616	663285			
5	1	29.77	1.21	37.00	5679327646	80.42		5251147375	74.36	70621	25434			

- Automated the process to produce concat qseq
- Automated data compression for Illumina data after alignment is done
- Automated the process to run BCL converter to generate qseq files from bcl files

- Added BCL overdue check which sends out notification email when BCL convert files due to a bug in Illumina software
- Added BWA alignment pipeline
- Added index support for BWA alignment pipeline
- Added transcriptome support for BWA alignment pipeline

LIMS Background Improvements

(Changes that may be invisible to users such as database schema changes, performmance upgrades, refactoring etc)

- Refactored Prep module to utilize CGI_Application model (added Prep App, Prep Views modules)
- Added ability to submit Illumina/SOLID/454 data to Short Read Archive (SRA) and Epigenomics Data Analysis and Coordination Center (EDACC)
- Added ability to submit Whole Genome Assembly (WGA) sequencing data to Trace Archive
- Added ability to specify indexed libraries for submission and automatically split SRF run data by index
- Added Cluster module to help and keep track of cluster job submissions.
- Improved tracking of web service and API usage [hotfixed]
- 1-Well plates now tracked as Tube instead of Library_Plate [hotfixed]
- Added automate archive from /archive/sbsdata to /gsc/archive for both Illumina and SOLiD platform
- Moved primary data storage from /archive/sbsdata to /projects/sbs_primary for both Illumina and SOLiD platform
- Writing all analysis data to /projects/sbs_primary for both Illumina and SOLiD platform
- View editor contains new entry fields for better organization, including: left join, separate WHERE condition for joins, and mandatory fields
- View editor can accept attributes in the query as if they were normal fields (i.e. Plate.RIN)

New Departments

- Set up BioSpecimen Core Department with responsibility to receive & enter imported sample information.
- Set up TCGA Department to enable easy access to project specific views for administrators

Set up Prostate_Lab department and additional tracking for CLIPR data (as a new Run Type).

Deferred Requests

(Improvement requests that we are aware of, but which are being deferred due to relatively lower priority)

Future Development

(larger scale improvements which would require implementation only at release time, but which may not be available in the near future)

Hotfix Patches since previous release

(list of patches that have been implemented as upgrades from the prior release. These may or may not have been applied prior to the new release)

Hotfixed:

- Installation.pat Upgrades to the installation process.
- Queue_Core.pat
 Set up a queueing system for prioritizing runs
- upgrade Core 2 6.pat
- add Equipment Attribute.pat
- add Study Attribute.pat

- add_Analysis_Software_Attribute.pat
- add fields to SolexaAnalysis.pat
- require Reference Code (SOW) for all submissions
- added optional link between SOW (Funding) and Jira Tickets
- added links to more easily add collaborators to Projects via Project, Work Request, Funding pages
- added tooltip to show when links are redirecting to home pages
- included Attribute values in search (for Plate, Sample, Original_Source, Library, Source)
- Add_Adapter_Index_Sequence.pat
- Run_Analysis.pat
- Run_Analysis_upgrade.pat
- Run_Analysis_Current_Analysis.pat
- Run Analysis Attribute.pat
- Multiplex Run Analysis.pat
- Multiplex Run Analysis Update.pat
- Multiplex_Run_Analysis_Attribute.pat
- SOLID_Run_Analysis.pat
- Add_Genome_to_SOLID_Run_Analysis.pat
- · Add Sample ID to SOLID Run Analysis.pat
- Multiplex_SOLID_Run_Analysis.pat
- Multiplex_SolexaRun_Analysis.pat
- install_CLIPR_Run_Analysis_2_6.pat
- install_Multiplex_CLIPR_Run_Analysis_2_6.pat

Not Hotfixed:

move_plate_class_plus.pat
 Move Plate_Class attribute to the Plate table and other changes