SMRT Link v5.0 Update

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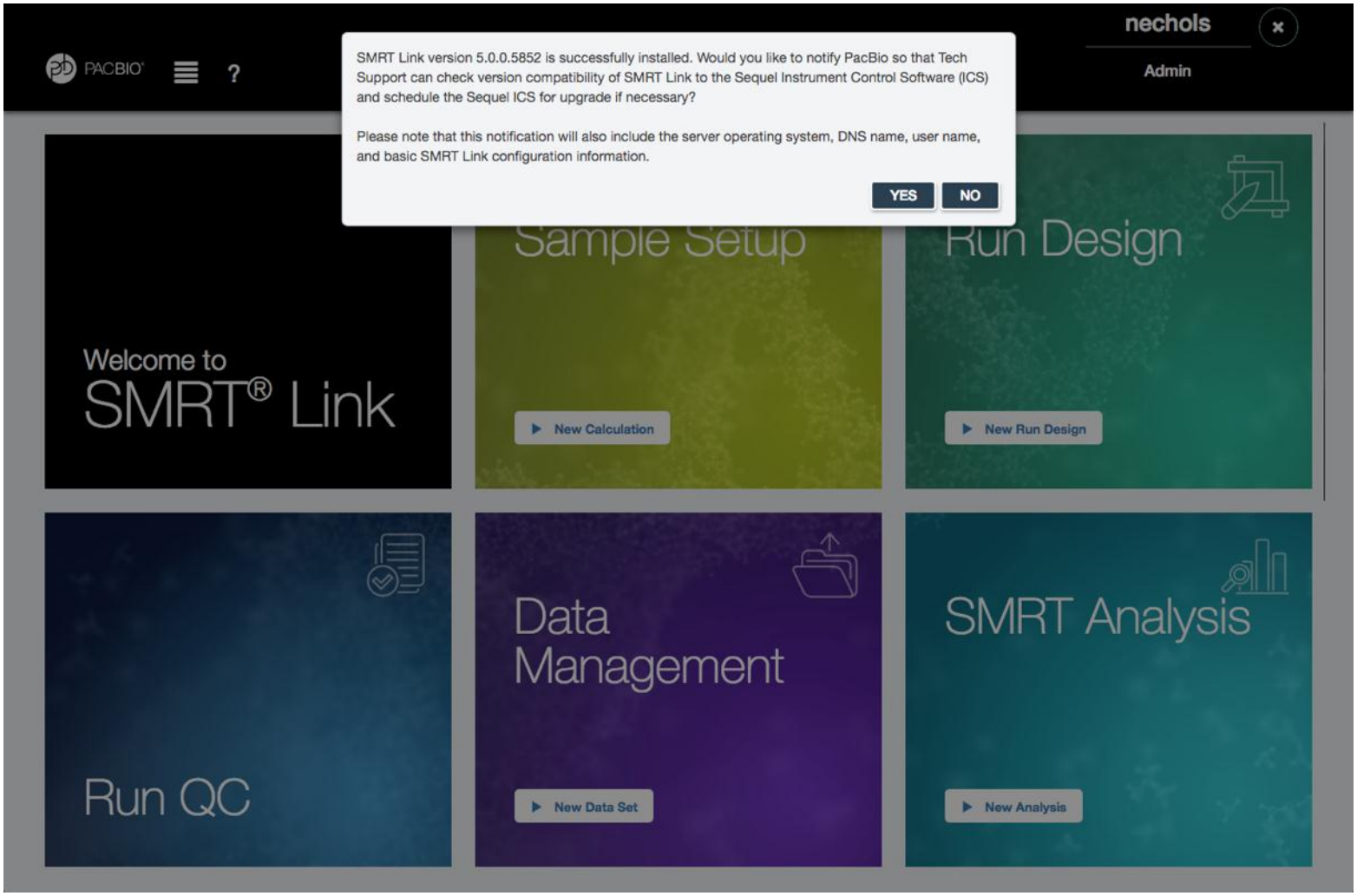
AGENDA

- SMRT Link platform new features
- SMRT Link module-based new features
  - Data Management
  - SMRT Analysis
- Known issues
- Fixed issues

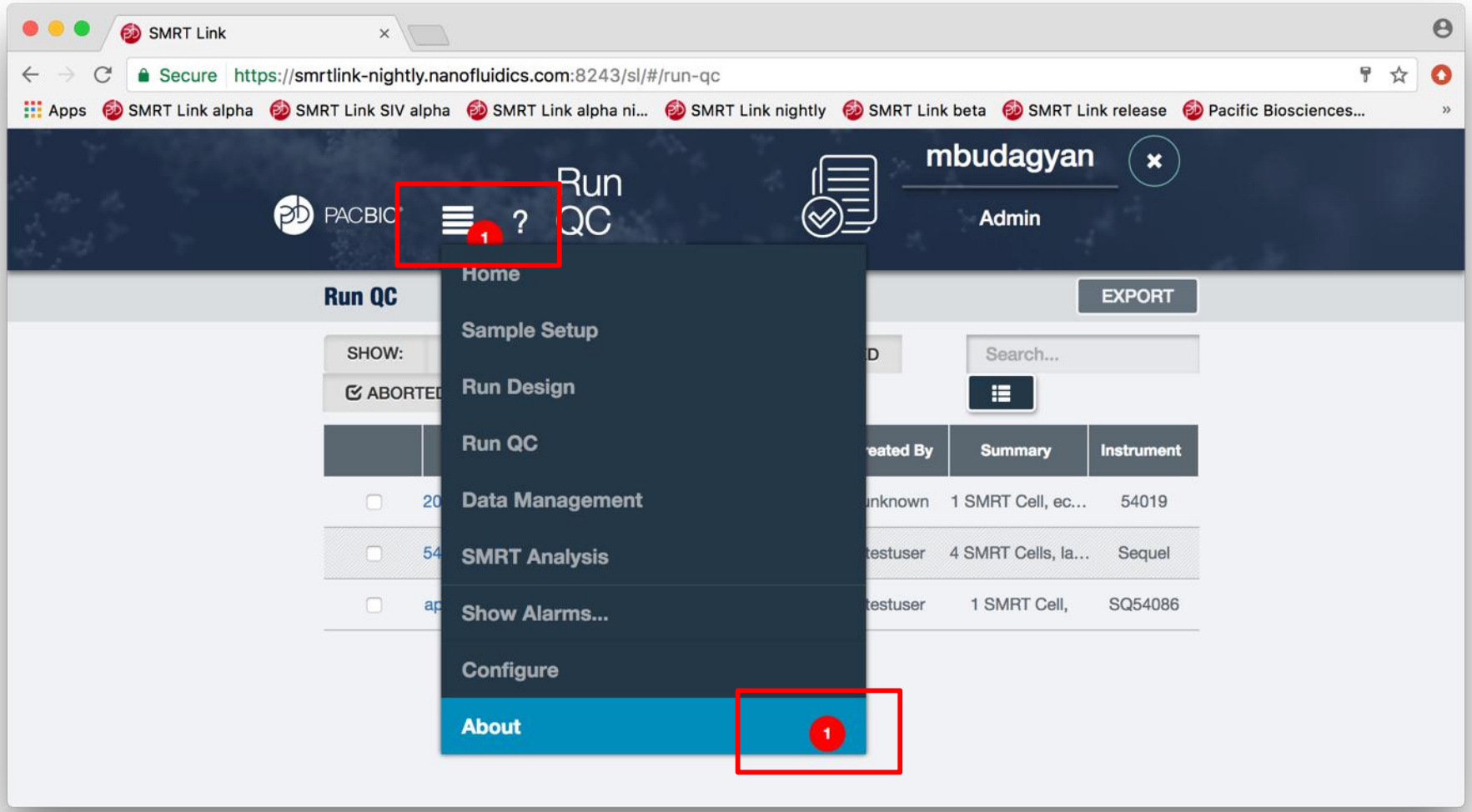
SMRT LINK V5.0 PLATFORM NEW FEATURES

- Notify Tech Support about readiness for ICS upgrade
- Easy update of SMRT Link compatibility with new chemistries which does not require reinstalling SMRT Link
- Persists configuration of LDAP and SSL Certificate if you have them integrated with SMRT Link v4.0
- Ability to open multiple different browser tabs with SMRT Link, share URLs, and use the Back browser button
- Support for the new 384 barcodes set for Sequel and RS II

NOTIFY TECH SUPPORT OF READINESS FOR ICS UPGRADE



UPDATE OF CHEMISTRY WITHOUT SMRT LINK UPGRADE



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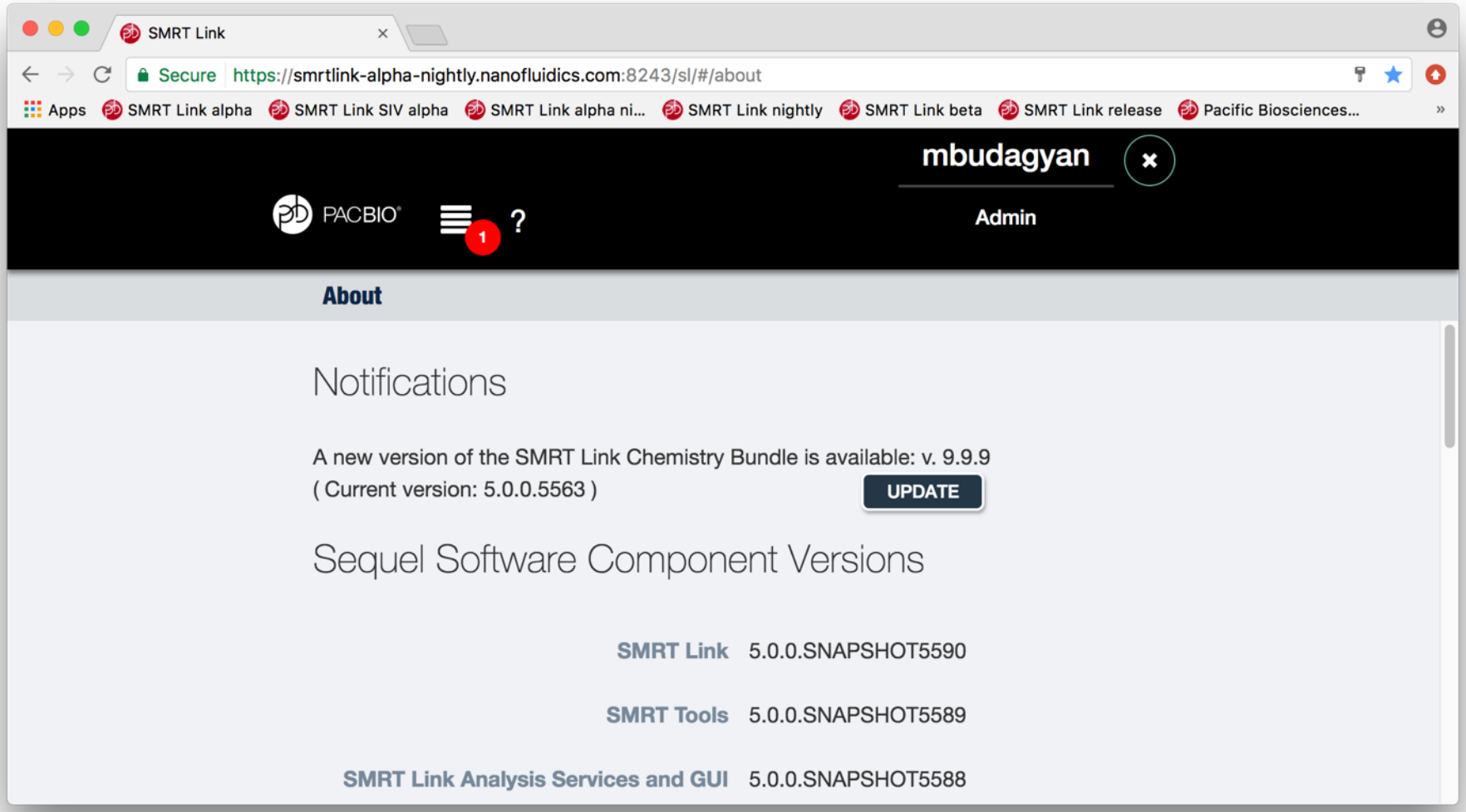
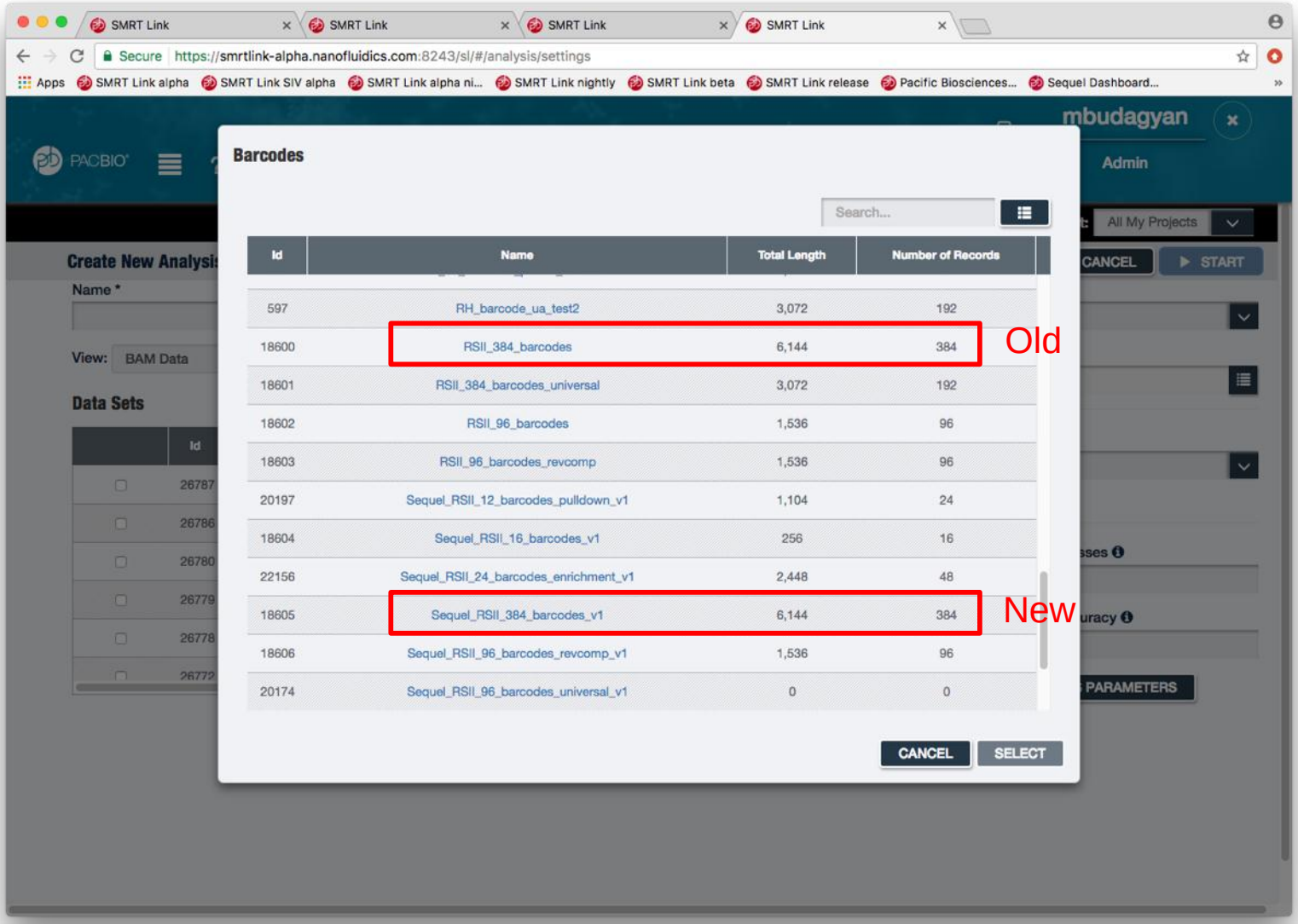


SUPPORT FOR THE NEW 384 BARCODES SETS



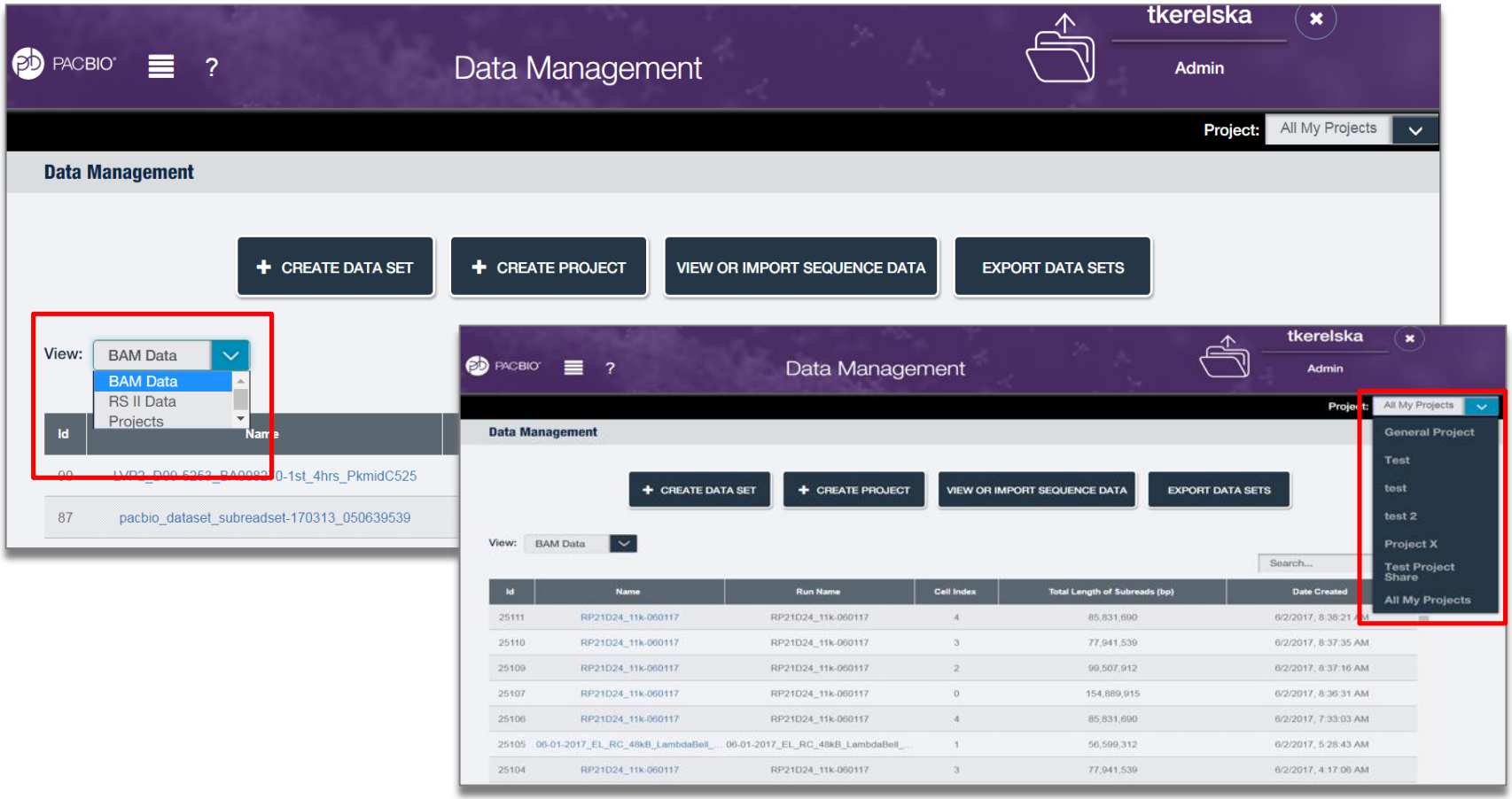
Data Management

NEW FEATURES IN DATA MANAGEMENT

- Projects – View and One Click access
- Project Ownership and Management
- Share Projects with SMRT Link Users
- Data Sets:
  - Delete
  - Copy
  - Export

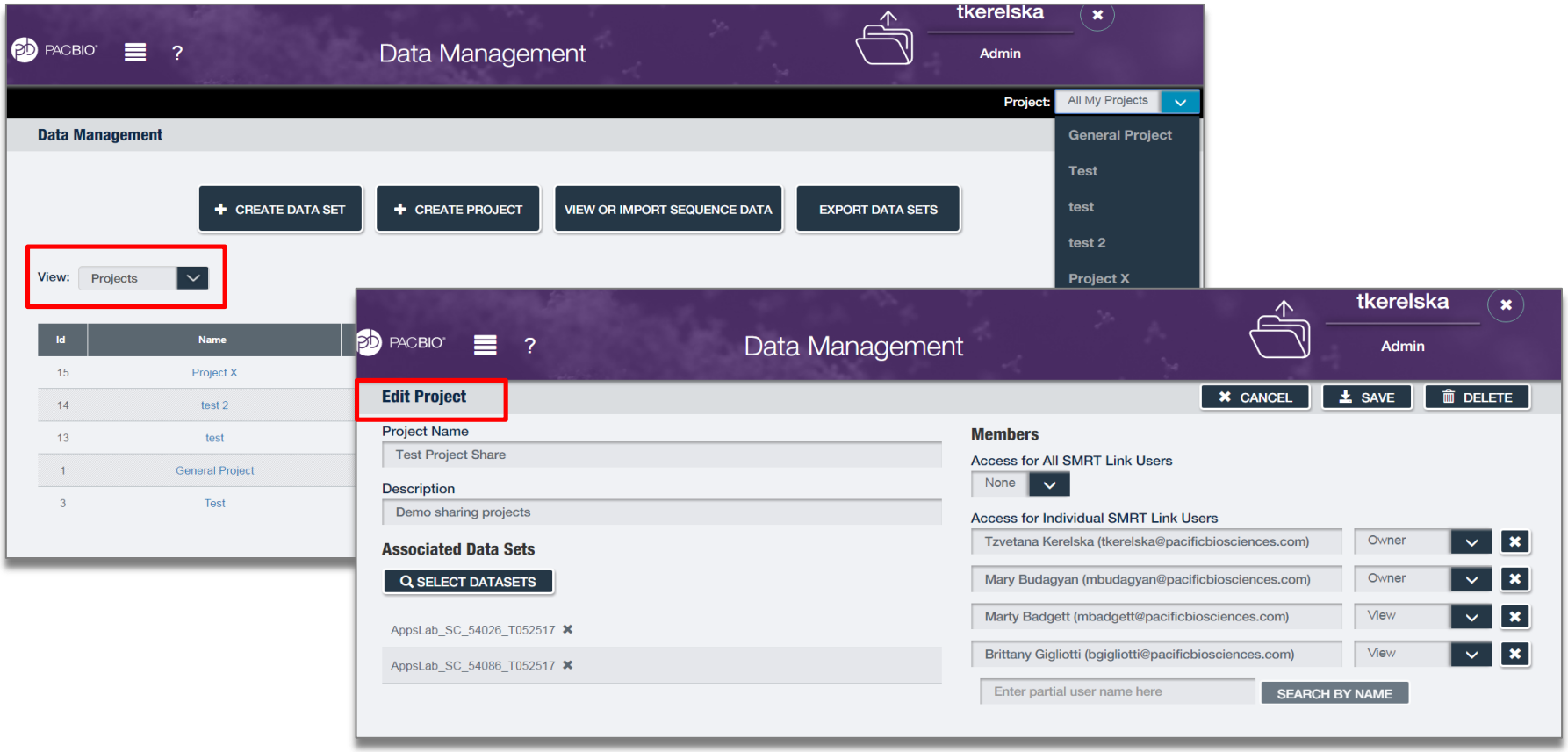
VIEW AND ACCESS PROJECTS

Two ways to access Projects – through “View” and One Click access



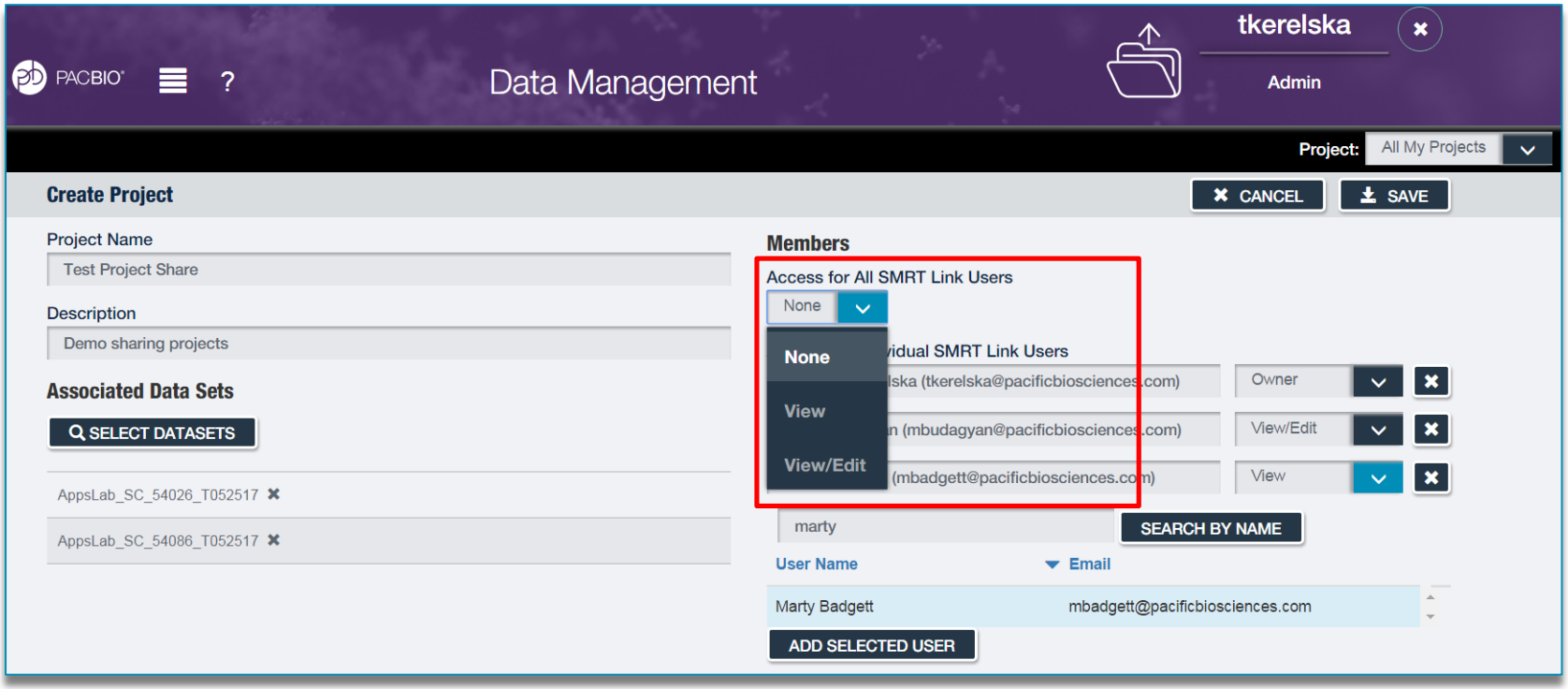
VIEW PROJECTS

Once a project is selected, its contents can be edited from users with proper access permissions



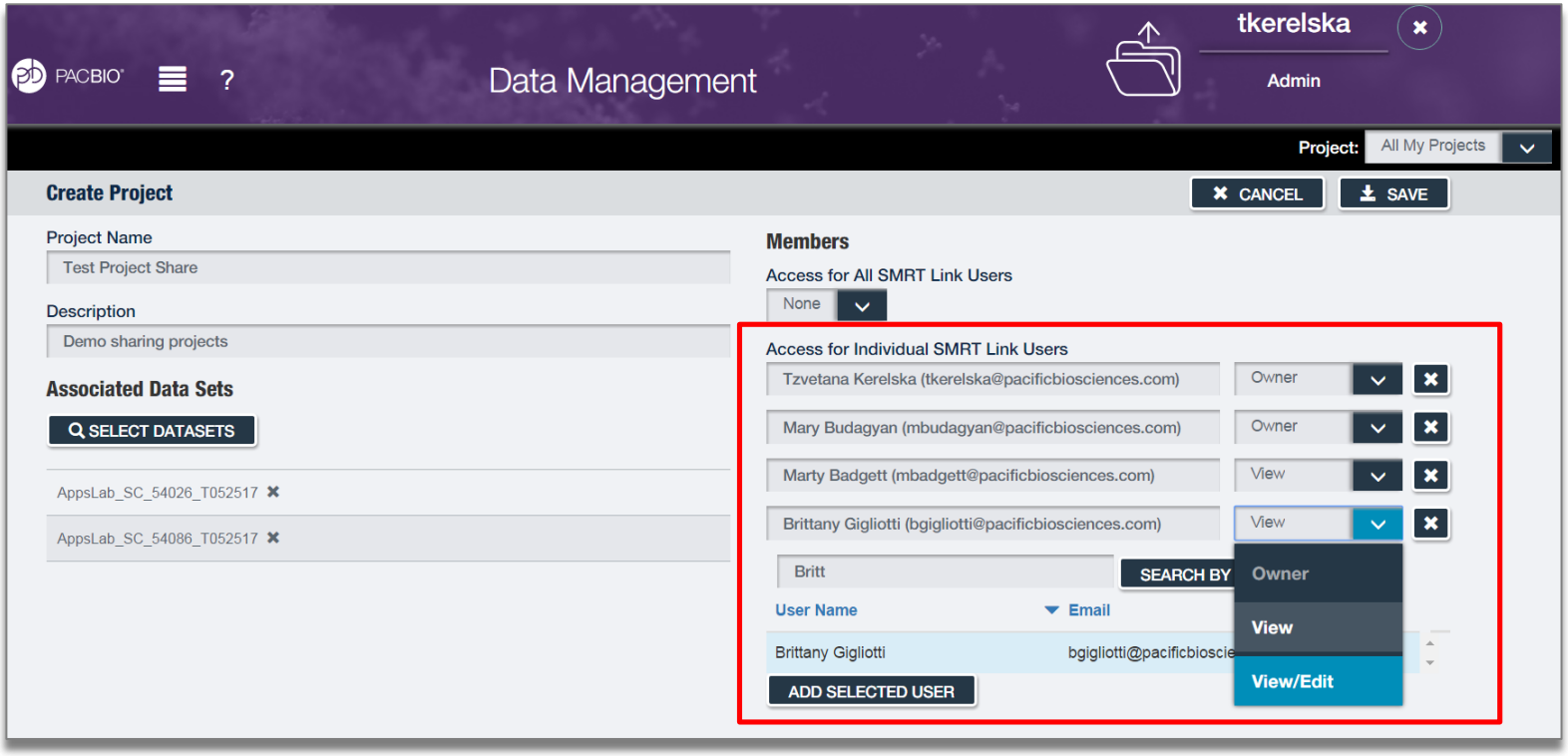
SHARE PROJECTS WITH SMRT LINK USERS

Share Projects with All SMRT Link Users – None, View or View/Edit



SHARE PROJECTS WITH SMRT LINK USERS

Share Projects with specific SMRT Link Users – Owner, View, View/Edit

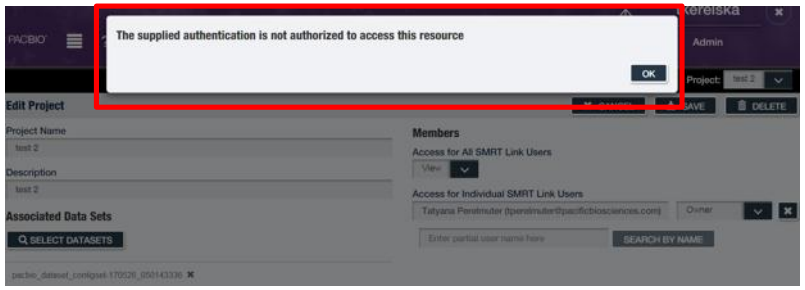


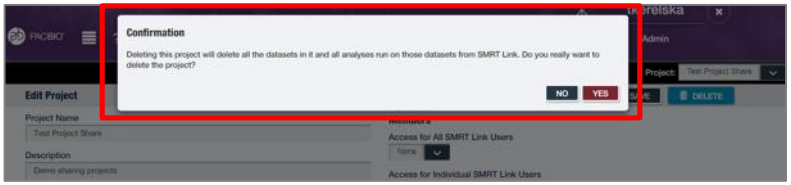
Note: SMRT Link will seemingly let user delete the only project owner, but when project is saved, the owner is not deleted.

PROJECT OWNERSHIP AND MANAGEMENT

Permissions and available actions

- User creating the project is project owner
- Unless shared with other SMRT Link users, project is only accessible to the user that creates it
- Project must have one or multiple owners
- Only owner/s can delete a project
- Deleting a project deletes all data sets and analyses in it



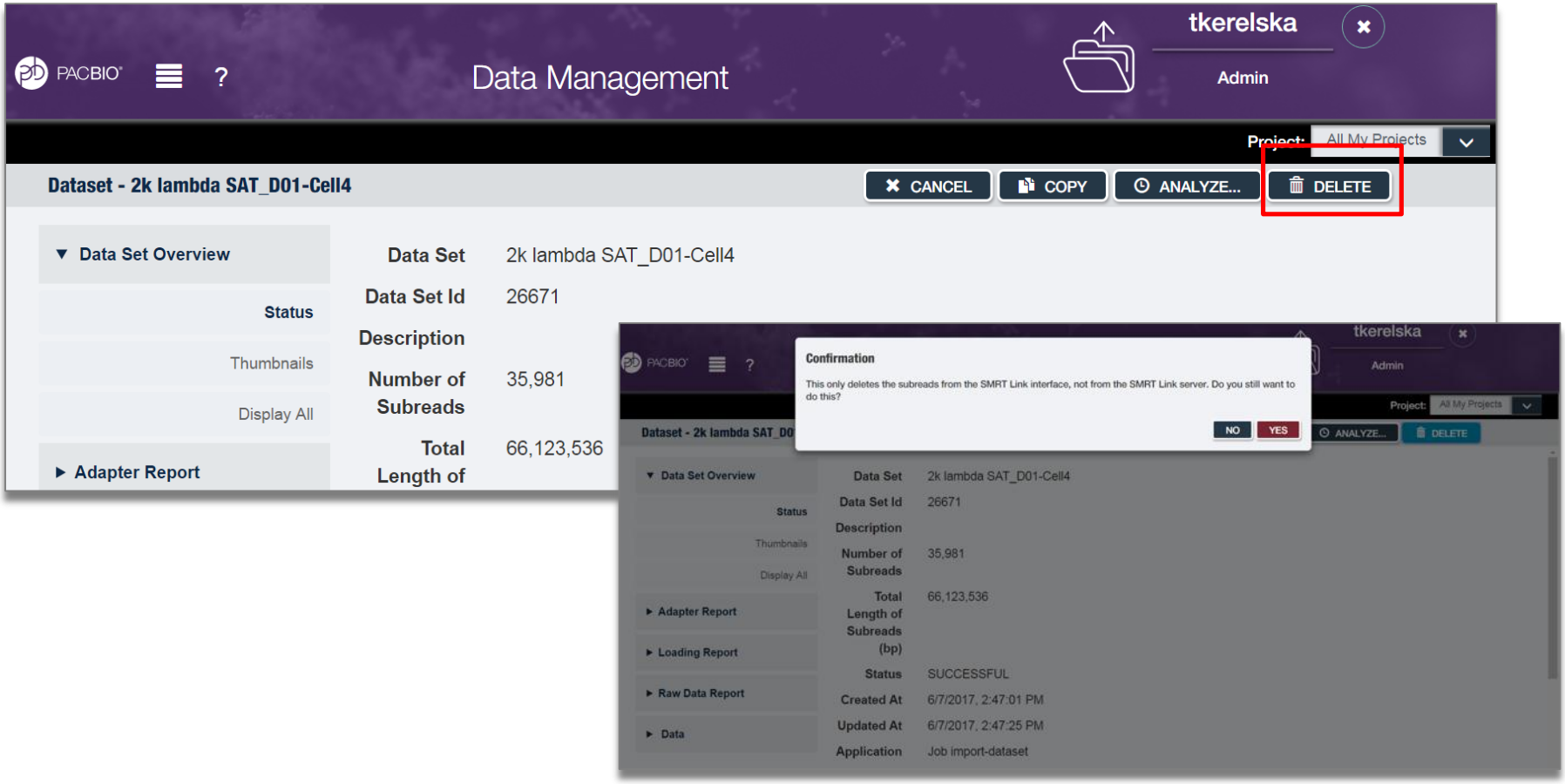


Note: If the Project Owner has set access permissions for all SMRT Link users through the “Access for All SMRT Link users” option, s/he can increase user's access level by adding him/her to the individual member list through “Access for Individual SMRT Link Users”. However, user access can not be decreased through described mechanism.

Example: If "Access for All" is "View" and Owner individually gives user A "View/Edit", then user A will be able to edit. But if "Access for All" is "View/Edit" and owner gives user A "View", user A will still be able to edit the Project.

DELETE A DATASET

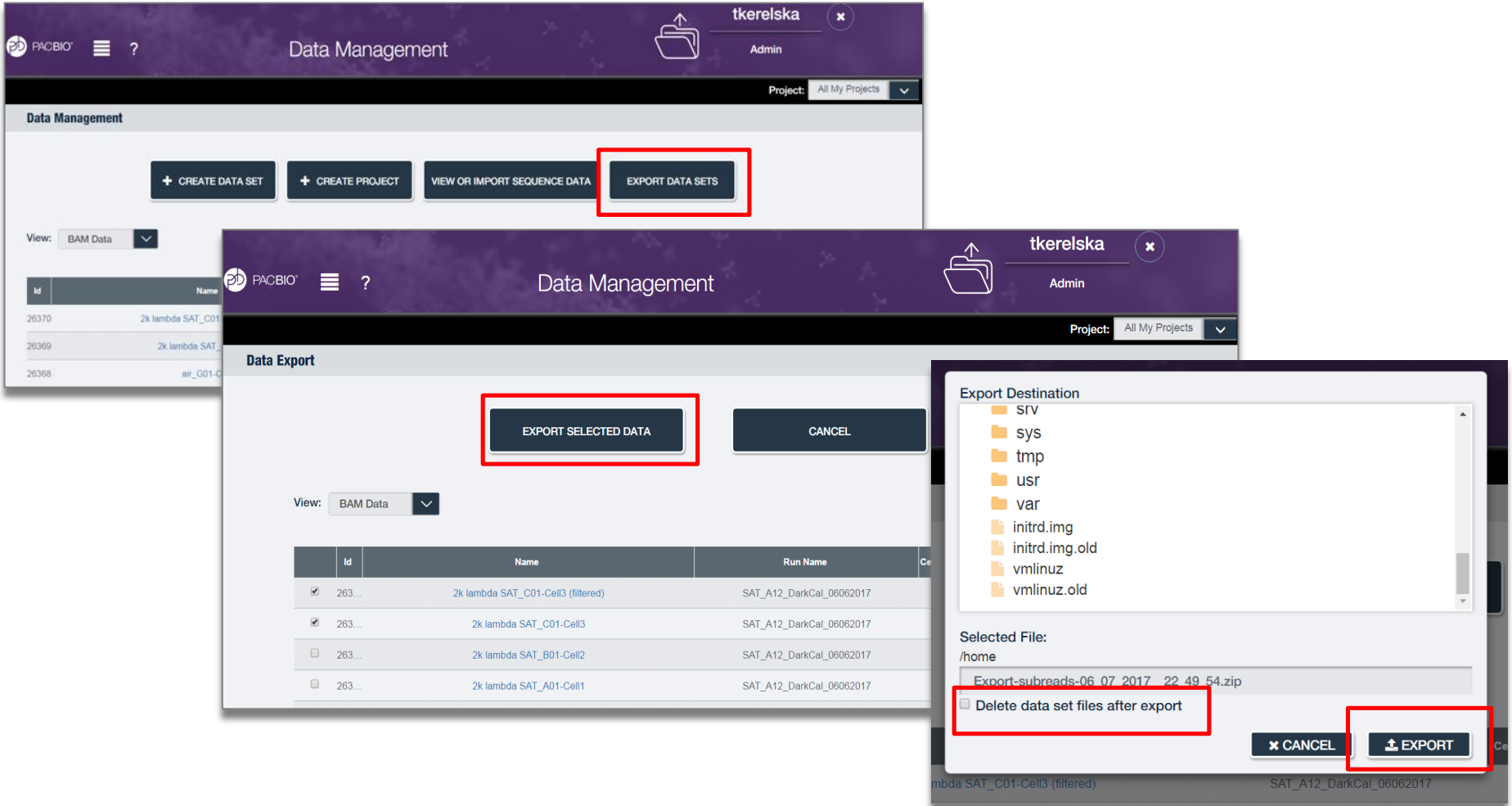
Dataset is only deleted from SMRT Link, not from the network server



EXPORT DATASETS

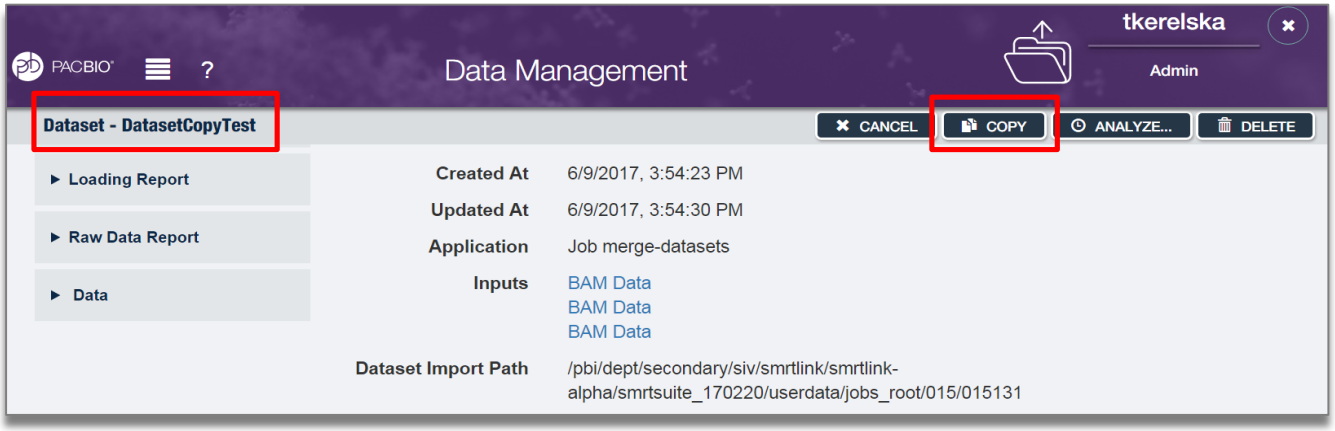
Datasets are compressed and exported in selected folder.

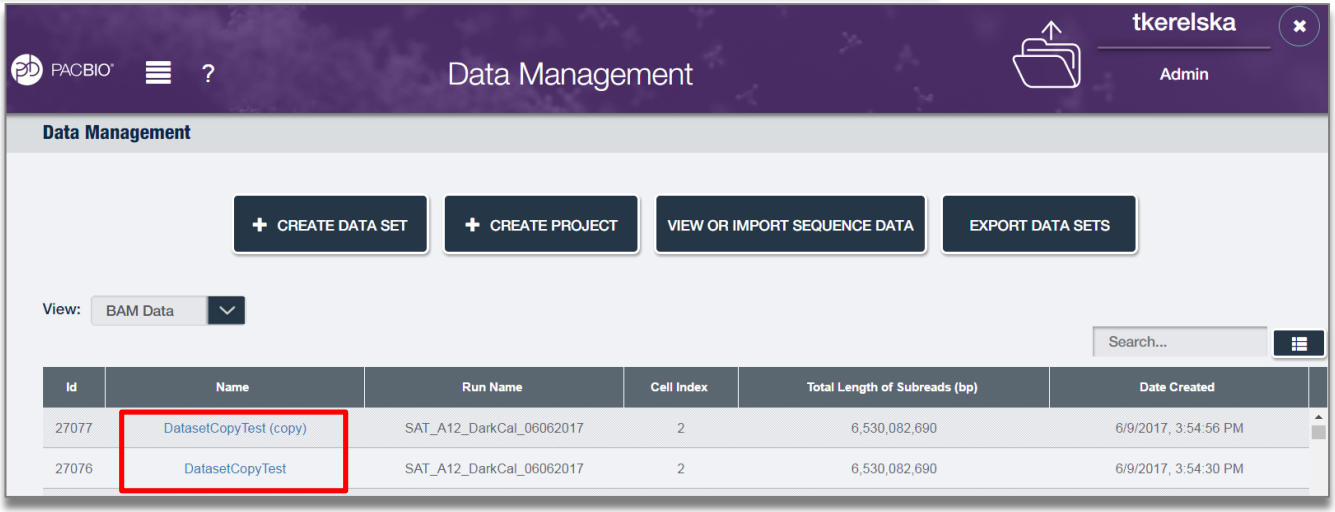
Optionally datasets can be deleted from SMRT Link at the time of export



COPY DATASET

Useful when a user needs to make changes to a dataset without impacting other users working with same dataset



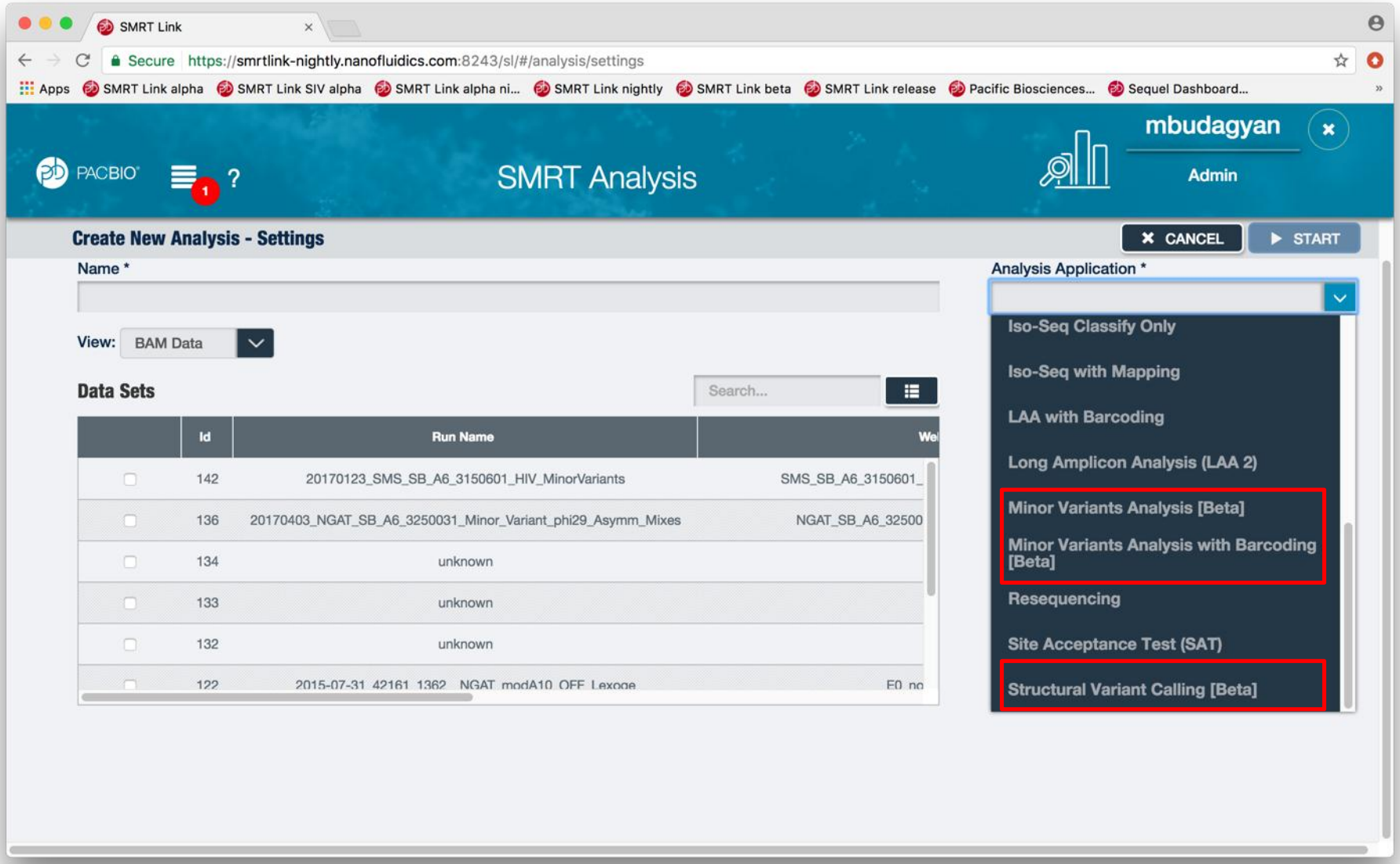


SMRT Analysis

SMRT ANALYSIS: NEW FEATURES

- Minor Variant Analysis Application (Beta) (also with Barcoding)
  - Identifies and phases minor single nucleotide variants in complex populations
  - Generic Minor Variant application for any target organism or gene
  - Includes example configuration for the HIV *pol* coding region
- Structural Variant Analysis Application (Beta)
  - Identifies large insertions and deletions (default ≥50 bp) in a sample relative to a reference from whole genome sequence data
- In case of failed analysis, send log files to PacBio Tech Support
  - Send analysis log files to PacBio tech support in case of failed analysis
  - Send system status files to PacBio tech support in case of system error

NEW APPLICATIONS IN SMRT LINK V5.0



MINOR VARIANT ANALYSIS

- **Minor Variant Analysis in SMRT Link (powered by Juliet)**
  - Reference-based codon amino acid calling (Indel variants disallowed)
  - ≤ 4kb amplicon (fully spanned by long reads)
  - Supported application: HIV *pol* coding region
  - Great results on viral HIV, oncology BCR-ABL and multigene cancer panel, synthetic biology Phi29 Enzymes

- **Reliable 1% minor variant detection**
  - With 6000 high-quality CCS reads per sample:
    - False negatives below detection (order 1/10,000)
    - ≤ 1% false-positive rate (PCR heteroduplexes)

- **Two analysis applications provided with and without barcodes**

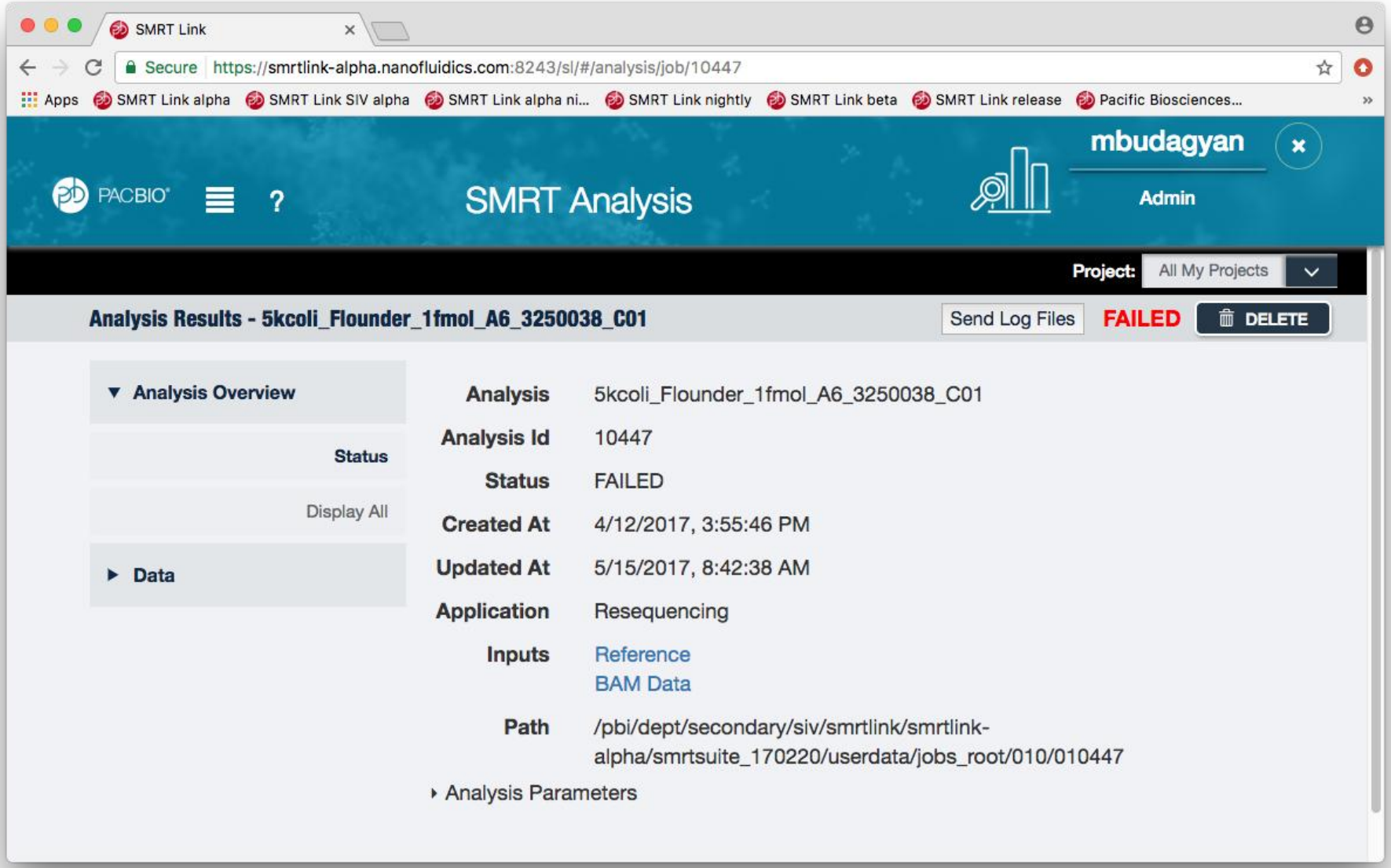
- **Drug resistance annotation for clinicians**
  - Pulled from publicly available databases

- **One-click application**

STRUCTURAL VARIANT ANALYSIS

- Structural Variant Caller in SMRT Link (powered by pvsv)
  - Reference-based structural variant calling (insertions and deletions ≥50 bp)
  - High sensitivity (88%) and low false discovery rate (5%) even at modest sequencing coverage (10-fold)
  - Assign genotypes and annotate variants for repeat content
  - Designed for human genome
- Outputs standard file formats
  - BAM for mapped reads
  - VCF and BED for variant calls
- Provides summary reports
  - Histogram of variant lengths
  - Table of counts by variant types and annotation
- One-click application

SEND FAILED ANALYSIS FILES TO TECH SUPPORT



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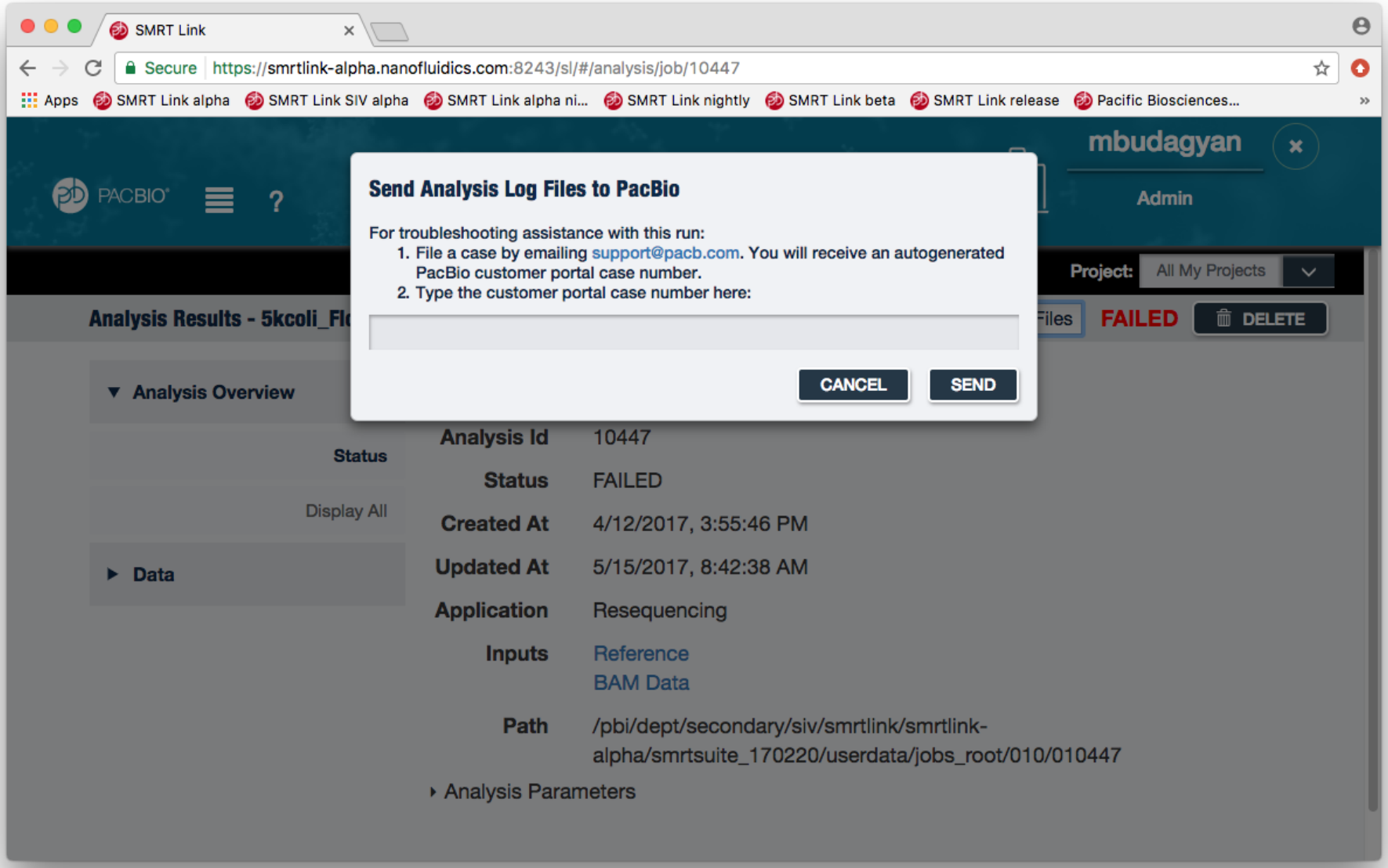
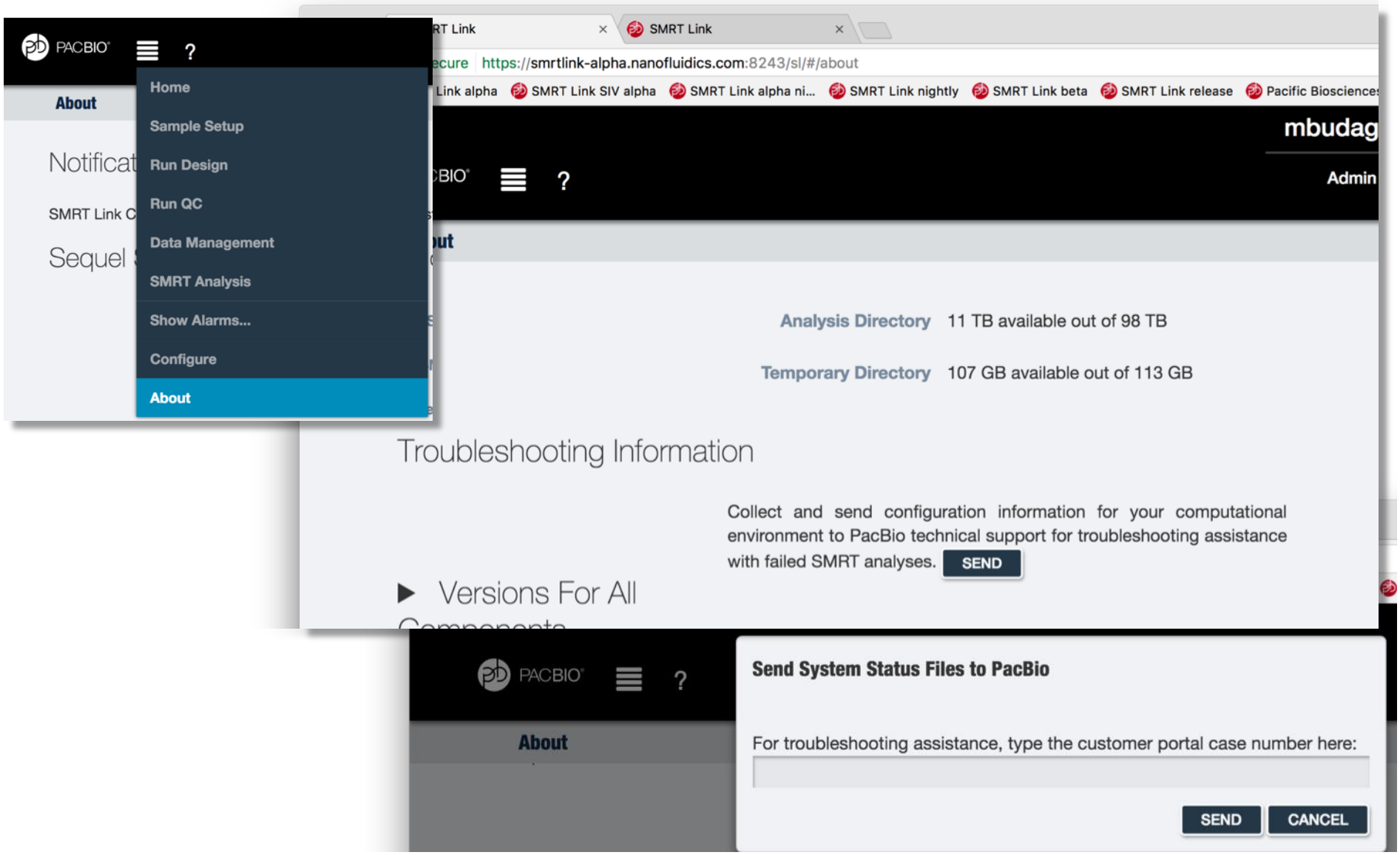


SEND SYSTEM LOG FILES TO TECH SUPPORT



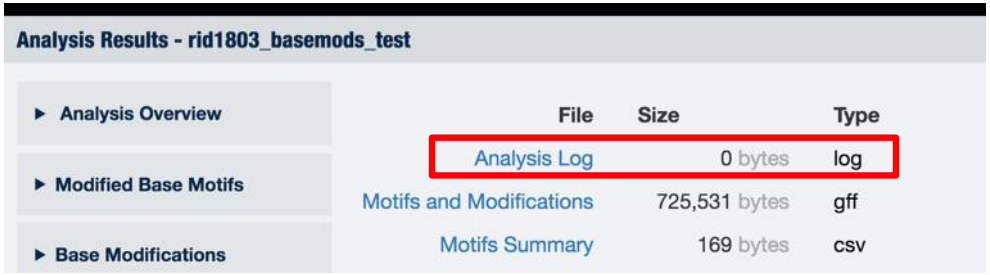
SEND LOG FILES TO TECH SUPPORT

- Files sent:
  - Failed analysis:
    - Any file within a job directory that matches these extensions: "sh", "stderr", "stdout", "log", "json", "html", "css", "png", "dot")
  - System status bundle:
    - All dirs under userdata "config", "log", "generated", "user_jmsenv"
    - Any log file only will take the last 2000 lines to keep the size of the total TGZ bundle small
- Destination of files: Internal event server
- Review process: Tech Support reviews emails posted to server

<u>Note</u>: ONLY emails with SalesForce Case Number get reviewed

KNOWN ISSUES

- Cannot delete references and barcodes through the GUI; they can be deleted only through the command line.
- In a SMRT Analysis results page, Data - File Downloads section, the Analysis Log file is correctly populated and downloadable, but file size is always shown as 0 bytes.



- At browser window sizes smaller than 1600x900, certain features may be inaccessible.
  - Also when run name is very long

FIXED ISSUES

- See Release Notes for complete list

- SL-527 Barcode 'names' in barcode report do not match CCS report names
- SL-617 Barcoded HGAP4 application - filtered subreadset is used for assembly, but total dataset is used for polishing.
- SL-1169 SMRT Link administrator cannot change password in WSO2. Fixed by providing a command-line tool to enable changing the password at post-install configuration.
- SL-1287 Several analysis applications used to output filtered data sets named identically to the input data sets. Now those output datasets are annotated with a “(filtered)” suffix.
- SL-1155 SFDC #116205 CCS2 with barcoding – min barcode score cannot be set
- SL-1156 When demultiplexing barcodes by running “dataset split –barcodes” at the command line, the output dataset chunks were formerly named according to descending order of read abundance. The behavior was fixed to name the chunks according to barcode index. This issue did not affect barcode analyses in the UI.
- SL-723 – In certain configurations of the compute and storage environment, the available server space displayed on the About page is incorrect.
- SL-944 SForce #57039 SMRT Link v4.0 change request: Remove nanofludics users from SMRT Link installation
- SL-1091 SMRT Analysis - Data Set creation too slow
- SL-1157 downloadable CCS2 with barcoding files need to be double-unzipped
- SL-1164 All Iso-Seq applications: Double negative in settings- “Ignore Poly A”
- SL-1182 Ability to delete stuck analysis jobs through the command line
- SL-41 Reduced frequency of analyses getting stuck in CREATED state
- Run Design and Run QC: By default, entries are not sorted by date. To sort entries, click the column header.
- Pbsmrtpipe does not handle properly string parameters that default to None.
- BLASR produces inconsistent gap placement in homopolymer stretches.
- For completed CCS mapping analyses, Mapping Report>CCS Mapping Statistics Summary incorrectly swaps the following values: Number of CCS Bases (mapped) and CCS Read Length N50 (mapped). Note: Mapping Report > Summary Metrics displays the same values correctly.

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