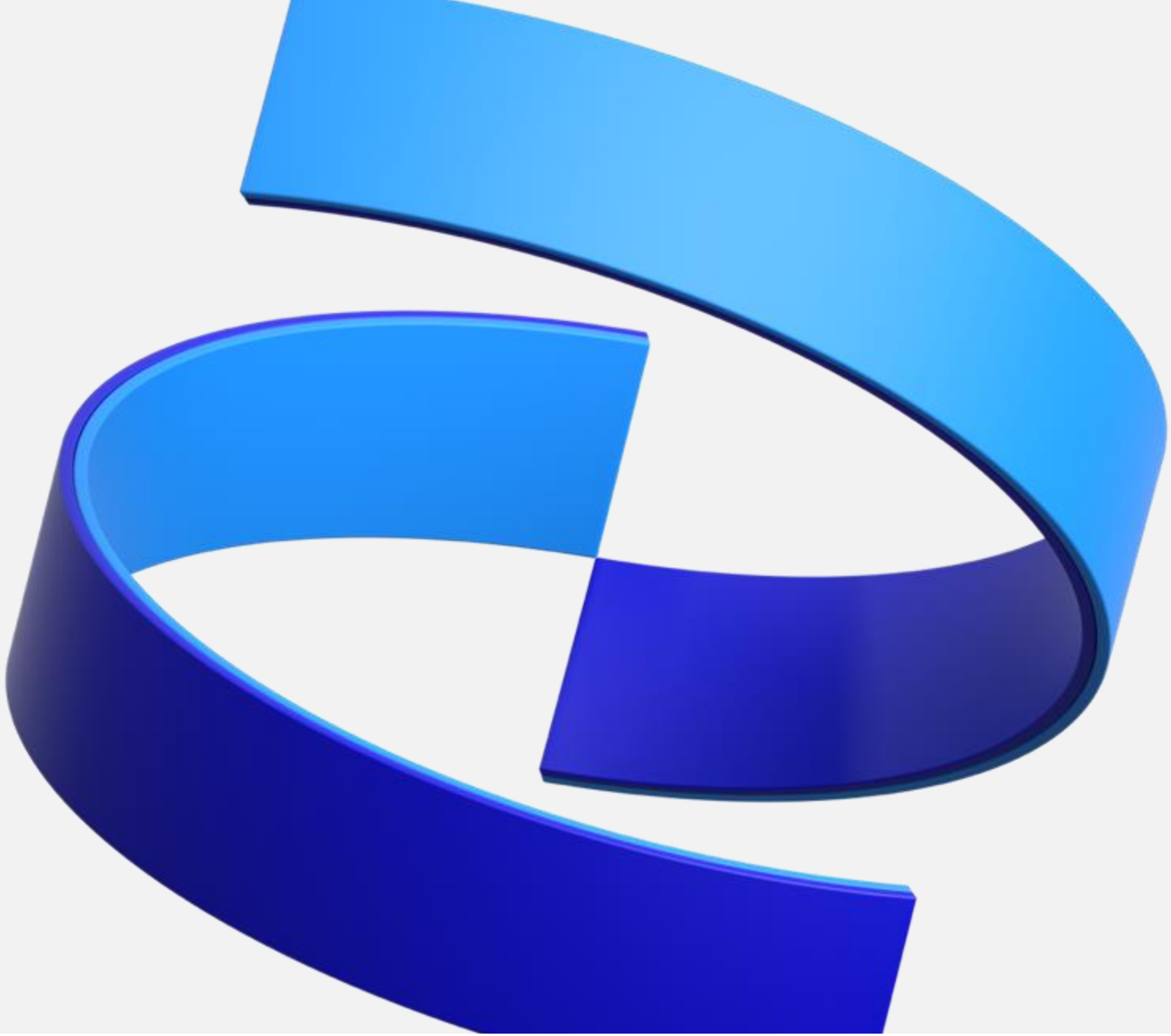
Creating, Submitting, and Viewing Genedata Biosensor Request: A Step-by-Step Guide



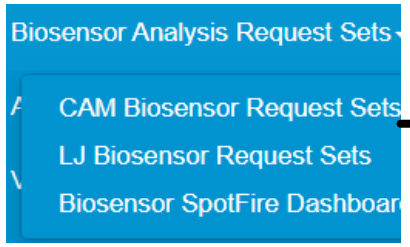
Paolo Casas and
Kerry Kelleher

02/09/2024

Overview

- Biosensor KSQ Genedata Integrated Workflow
- Creating, Editing, and Deleting Genedata Biosensor Requests
    - Creating Requests from PPB-IDs (Purified)
    - Creating Requests from Plate Sets (Unpurified: hybridoma, TAP sups, etc.)
    - Modifying Existing Biosensor Requests
- Viewing Genedata Biosensor Assay Results

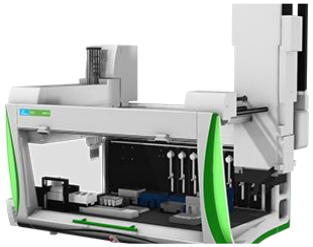
KSQ Biosensor Genedata Workflow



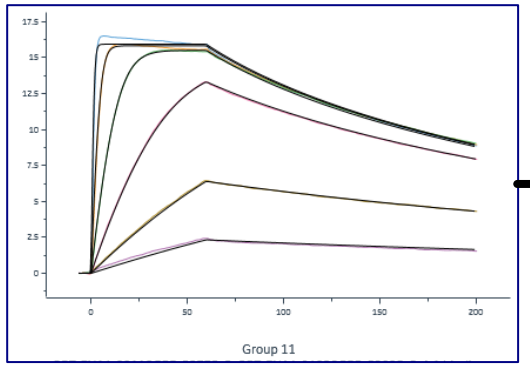
Biosensor Request Created

Ligand/Analyte Information

Biosensor Instrument Method



Janus Liquid Handler Instructions



Biosensor Experiment

Processed Data Uploaded into Genedata via Analysis Request System

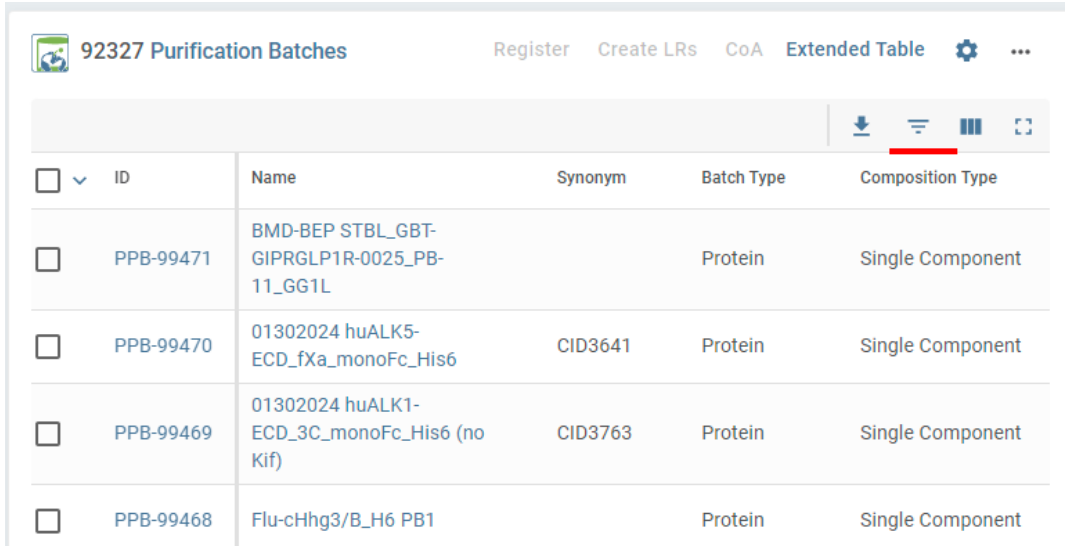
- Workflow starts and ends with Genedata
- Biosensor request facilitates liquid handling/biosensor instrument set up by providing the ligand/analyte information
- Request system provides an organized and centralized location for data to be stored and accessed

Creating Biosensor Requests from Purified Material (PPB-IDs)

1. Creating Biosensor Requests from Purification Batch Compendia (PPBs)

Genedata Biologics Home → Compendia → Production → Purification Batches

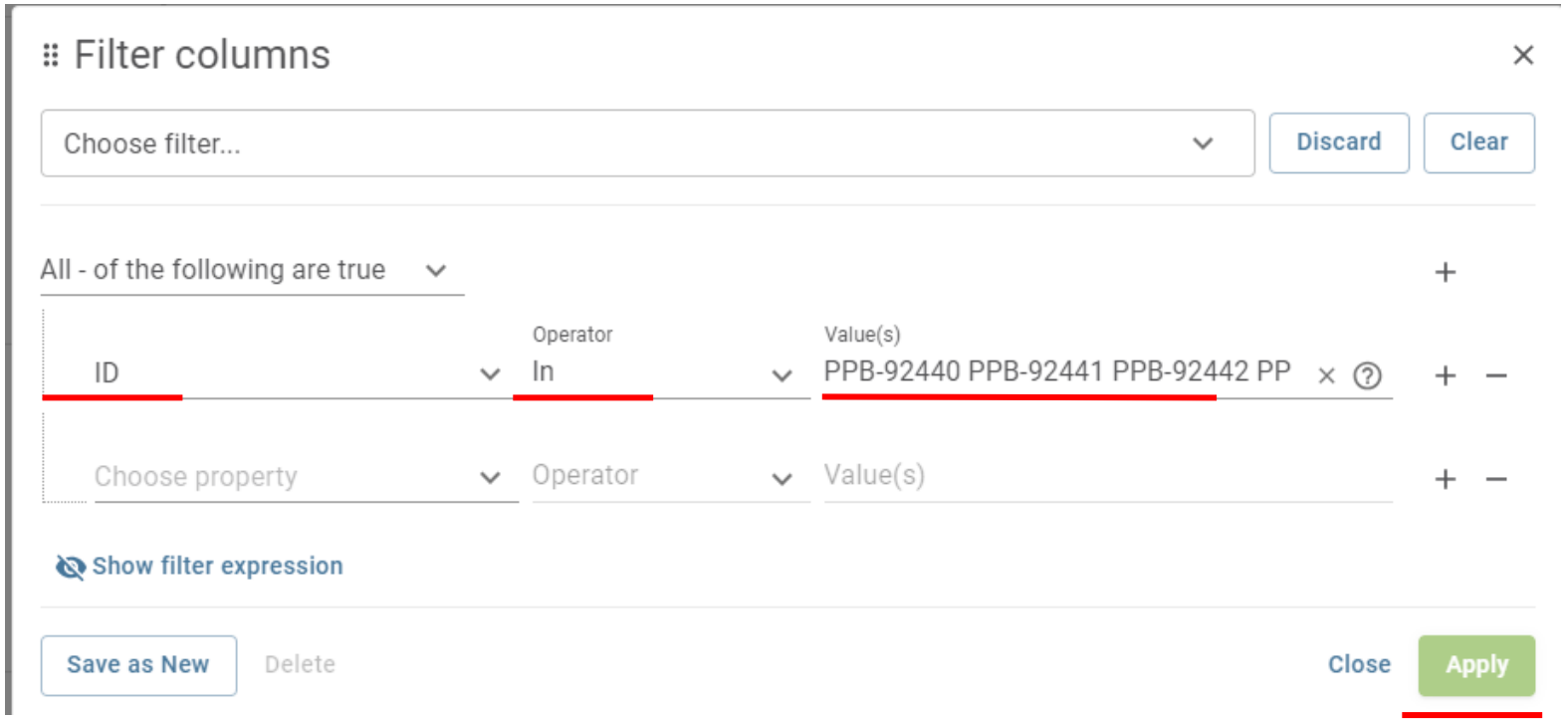
Select Filter Panel



1. Creating Biosensor Requests from Purification Batch Compendia (PPBs)

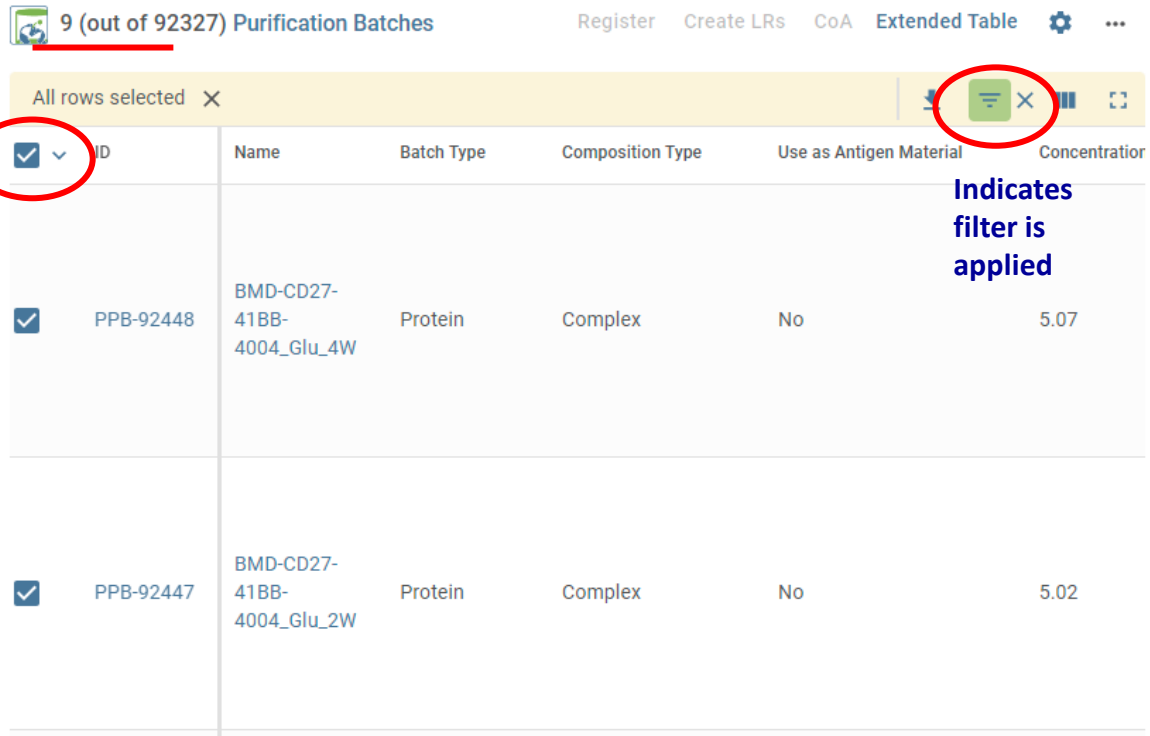
Set property to “ID”, operator to “In”, and paste a comma or space separated list as values

Note that if you received an excel file with the PPB-IDs listed in the column you can simply select the cells in the column and copy/paste directly into the value field.

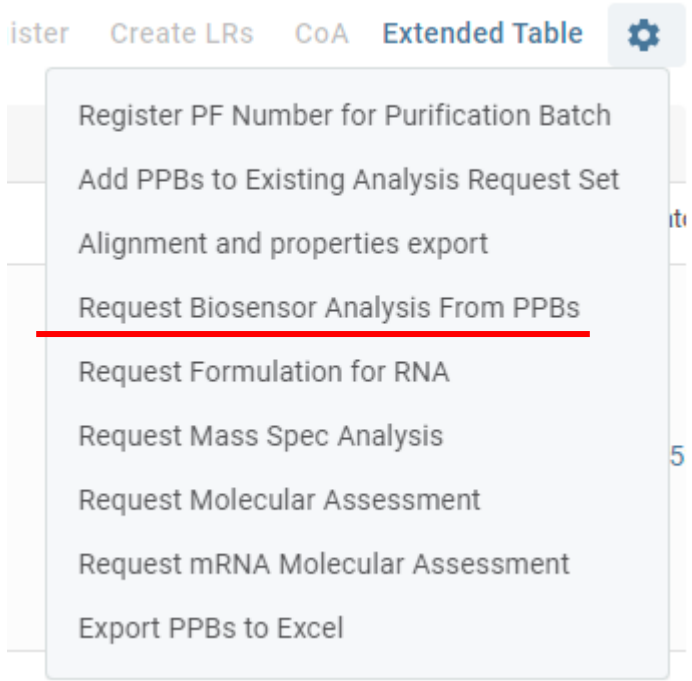


1. Creating Biosensor Requests from Purification Batch Compendia (PPBs)

Pressing “apply” filters the purification batches, check all PPBs

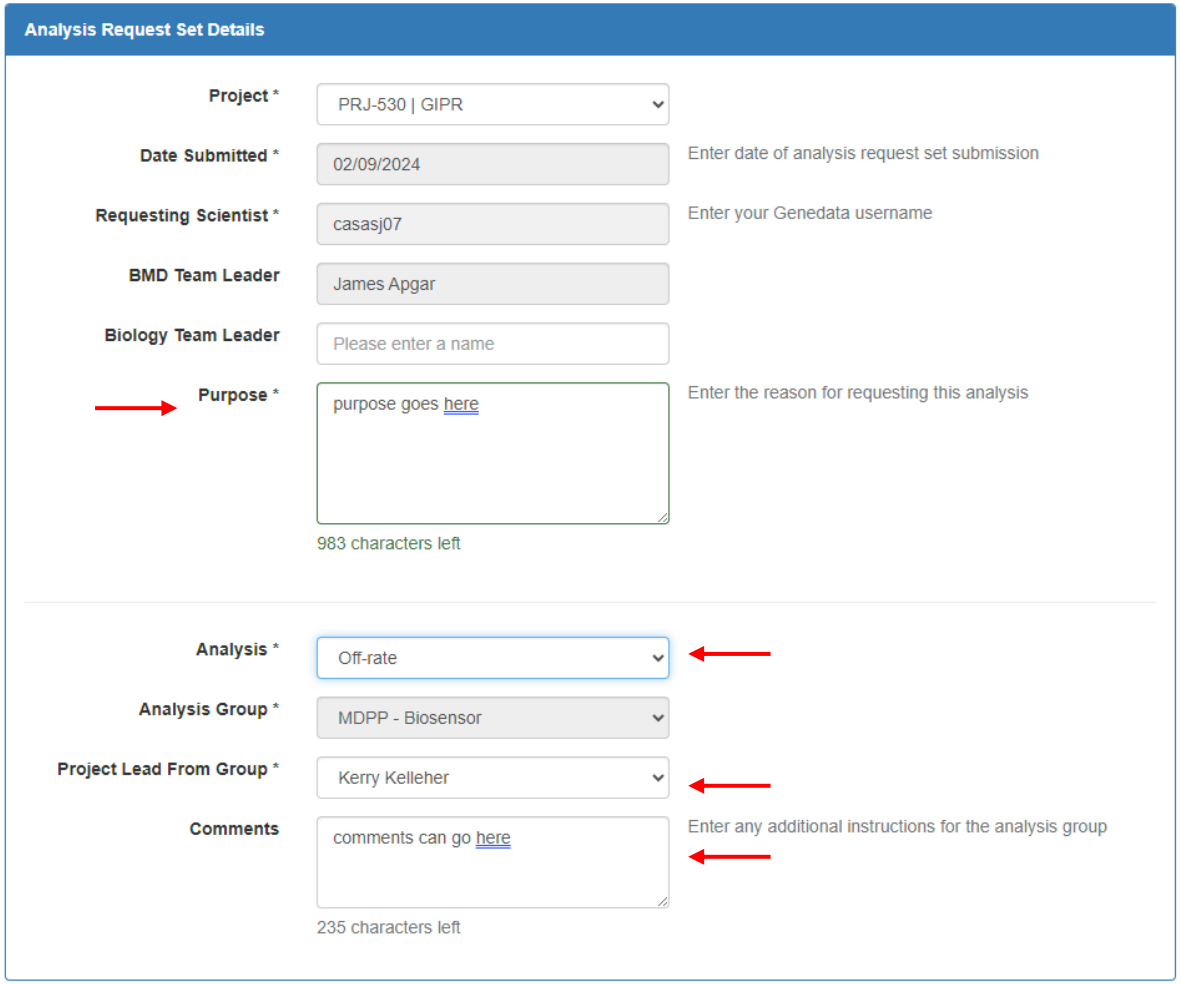


Gear Icon will allow creation of Biosensor Request from selected PPBs



1. Creating Biosensor Requests from Purification Batch Compendia (PPBs)

Enter Analysis Request Set Details within GDBxT



- * Fields are required with many being prepopulated

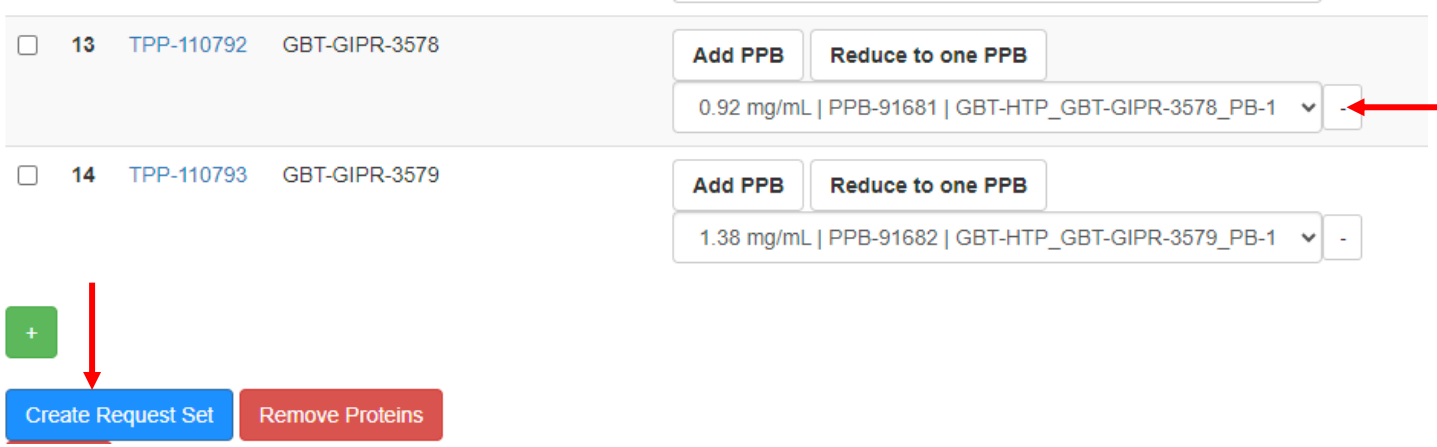
- Enter the **Purpose** of the request. Although not required, please provide the binding partner species, concentration, TP Name, PPB ID, ….
- Select the the **Analysis** type, (K_D Values, Off-rate,…)
- Select the **Project Lead from Group**.
- Include **Comments** that will be helpful for the Biosensor scientist to complete the request
- Information regarding which instrument was used is not required at this time, but will later be included as part of the laboratory results

Note: A request is a pairing of two proteins (example 1 Ab and 1 Ag), whereas a Request Set may include multiple pairings (example 5 Abs against 1 Ag).

1. Creating Biosensor Requests from Purification Batch Compendia (PPBs)

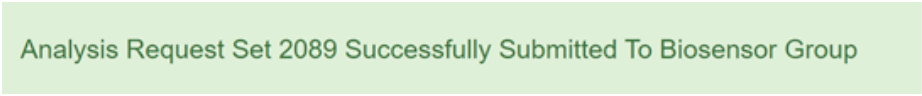
Complete the Request by Selecting the Protein Purification Batch (PPB)

Submit the Request by Selecting the 'Create Request Set' Button



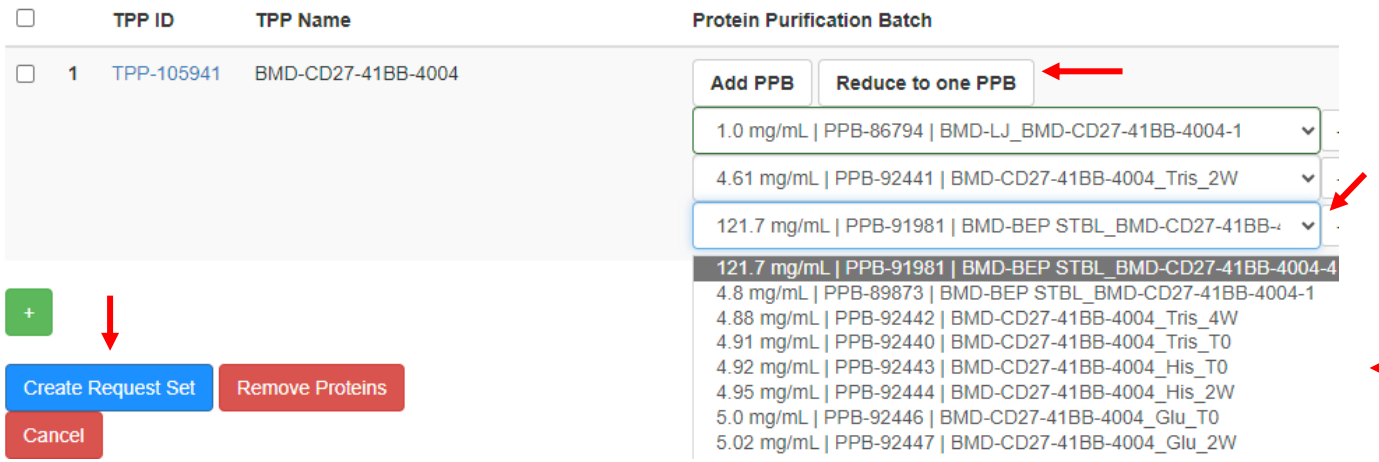
By requesting through PPBs in the purification batch compendia, the exact TPP-PPB hierarchy is automatically supplied for the user

Example of GDBxT Message Displayed after Selecting the 'Create Request Set' Button



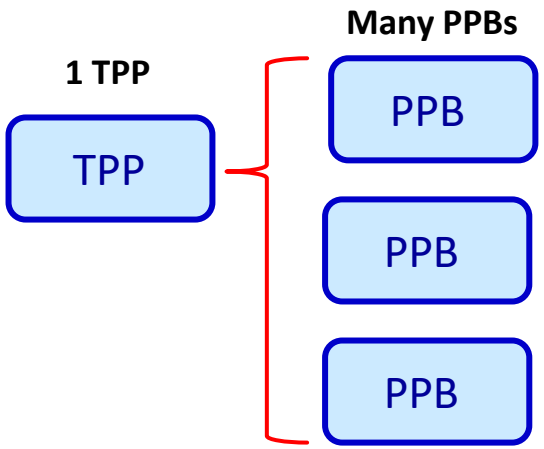
1. Creating Biosensor Requests from Purification Batch Compendia (PPBs)

Occasionally, the user will still need to select the specific PPB from the TPP using this method (ex. child PPBs with the same parental PPB ID/TPP for forced degradation analysis or bispecifics)



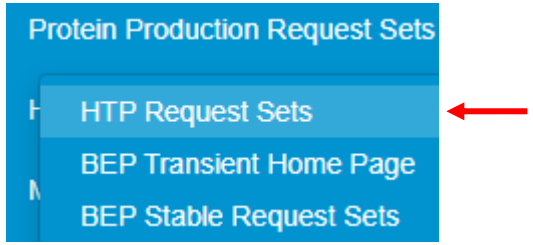
(Add or remove a PPB with the same TPP ID)

(Select the PPB for Biosensor analysis. The PPB ID and/or concentration (mg/mL) will help to identify the specific Protein Purification Batch for Biosensor analysis)



2. Creating Biosensor Requests from HTP Protein Production Request Sets

Select HTP Request Sets within GDBxT



Select the HTP Request Set Name

GBT-HTP Home Page

Request Sets | Active Requests | Expression Tasks | Purification Tasks | Available CM | Request Set Platesets

Export Basic

RS ID	Date Submitted	Request Set Type	Project	AT Code	Formats	Rationale
RS-23428	12/06/2021	-	TGFbeta	AR-700001320	One Armed IgG	RS of 47 + 1 Control TGFB OAA Microscale: data acquisition for Monica
RS-23427	12/06/2021	-	TGFbeta	AR-700001320	One Armed IgG	RS of 321 TGFB OAA Microscale: data acquisition for Monica
RS-23414	11/29/2021	-	CD3	HD-EX00033	One Armed IgG	screen for super low affinity aCD3 variants

2. Creating Biosensor Requests from HTP Protein Production Request Sets

Select All TPPs under Protein Purification Batches Section (usually found near the bottom of the RS page)

Protein Purification Batches

	TPP-ID	TPP Name	PEB-ID	PEB Name	PPB-ID	PPB-Name
☑	TPP-77980	GBT-TGFB-0740	PEB-49581	GBT-HTP_GBT-TGFB-0740_EB-1	PPB-58756	GBT-HTP_GBT-TGFB-0740_PB-1
☑	TPP-77979	GBT-TGFB-0739	PEB-49582	GBT-HTP_GBT-TGFB-0739_EB-1	PPB-58757	GBT-HTP_GBT-TGFB-0739_PB-1
☑	TPP-77978	GBT-TGFB-0738	PEB-49583	GBT-HTP_GBT-TGFB-0738_EB-1	PPB-58758	GBT-HTP_GBT-TGFB-0738_PB-1

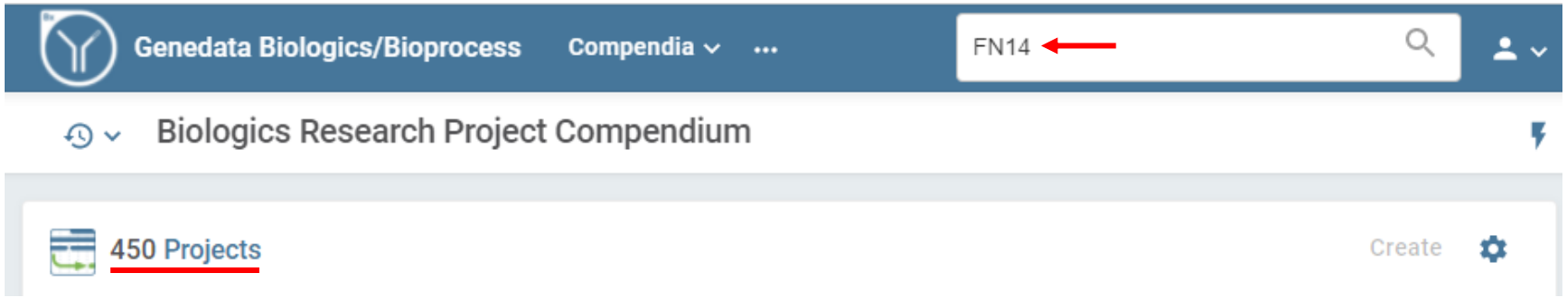
Select the 'Request Biosensor Analysis' Button

Add SEC Results | Add Lab Results | Download File for Tube Labeller | Request Molecular Assessment | Request Biosensor Analysis

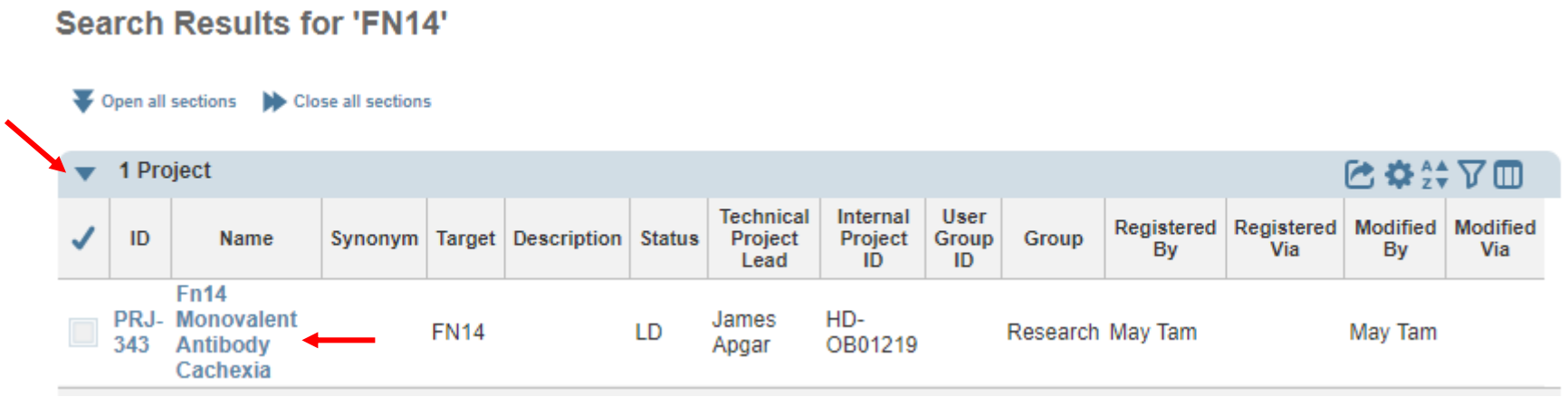
Most HTP request sets tend to have a 1:1 relationship between TPP and PPB-ID you will not need to manually select the PPB

3. Creating Biosensor Requests from Target Products (TP)

Genedata Biologics Home Page Search for the Project

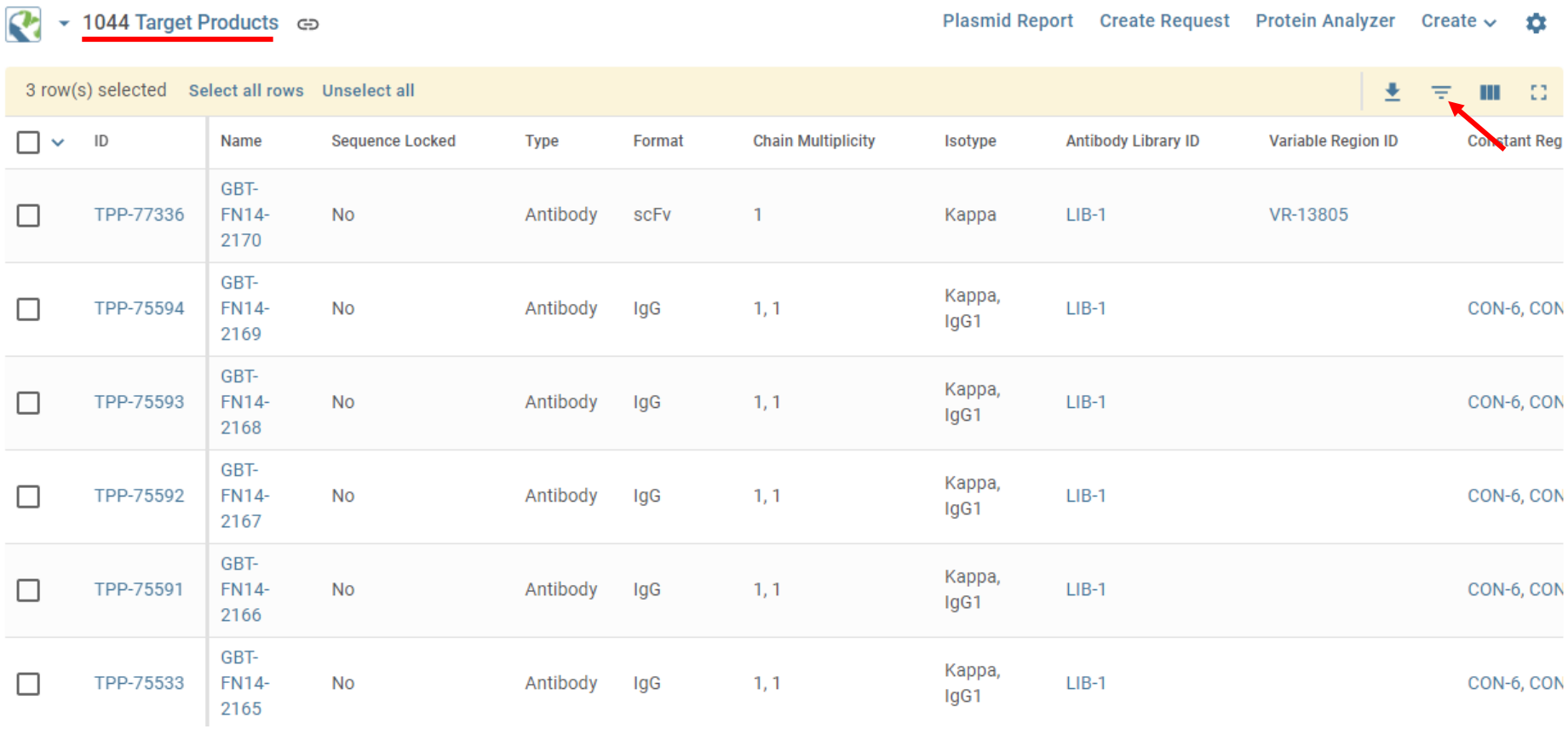


Select the Genedata Project Name



3. Creating Biosensor Requests from Target Products (TP)

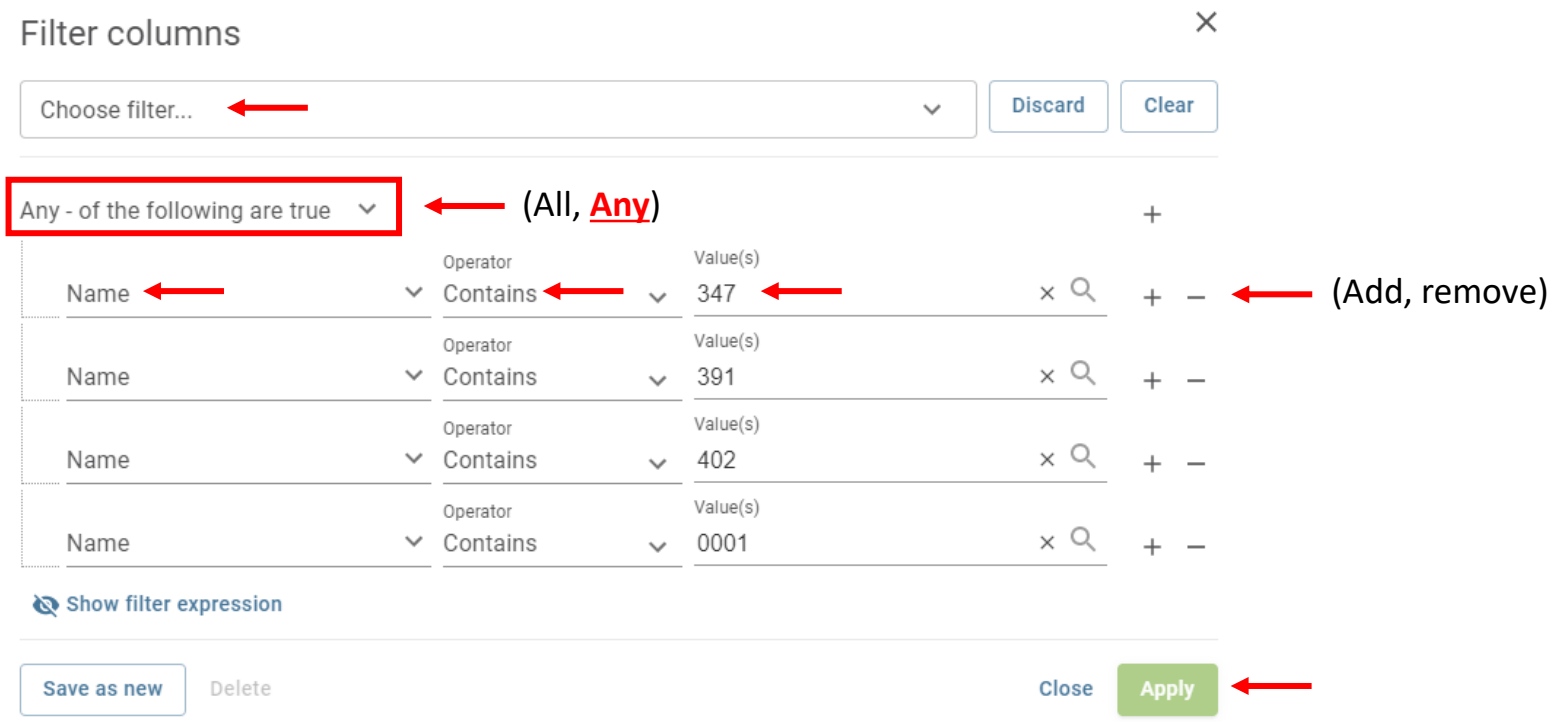
Select the Target Products Filter Icon



ID	Name	Sequence Locked	Type	Format	Chain Multiplicity	Isotype	Antibody Library ID	Variable Region ID	Constant Reg
TPP-77336	GBT-FN14-2170	No	Antibody	scFv	1	Kappa	LIB-1	VR-13805	
TPP-75594	GBT-FN14-2169	No	Antibody	IgG	1, 1	Kappa, IgG1	LIB-1		CON-6, CON
TPP-75593	GBT-FN14-2168	No	Antibody	IgG	1, 1	Kappa, IgG1	LIB-1		CON-6, CON
TPP-75592	GBT-FN14-2167	No	Antibody	IgG	1, 1	Kappa, IgG1	LIB-1		CON-6, CON
TPP-75591	GBT-FN14-2166	No	Antibody	IgG	1, 1	Kappa, IgG1	LIB-1		CON-6, CON
TPP-75533	GBT-FN14-2165	No	Antibody	IgG	1, 1	Kappa, IgG1	LIB-1		CON-6, CON

3. Creating Biosensor Requests from Target Products (TP)

Filter for the TP (biotherapeutic) Name

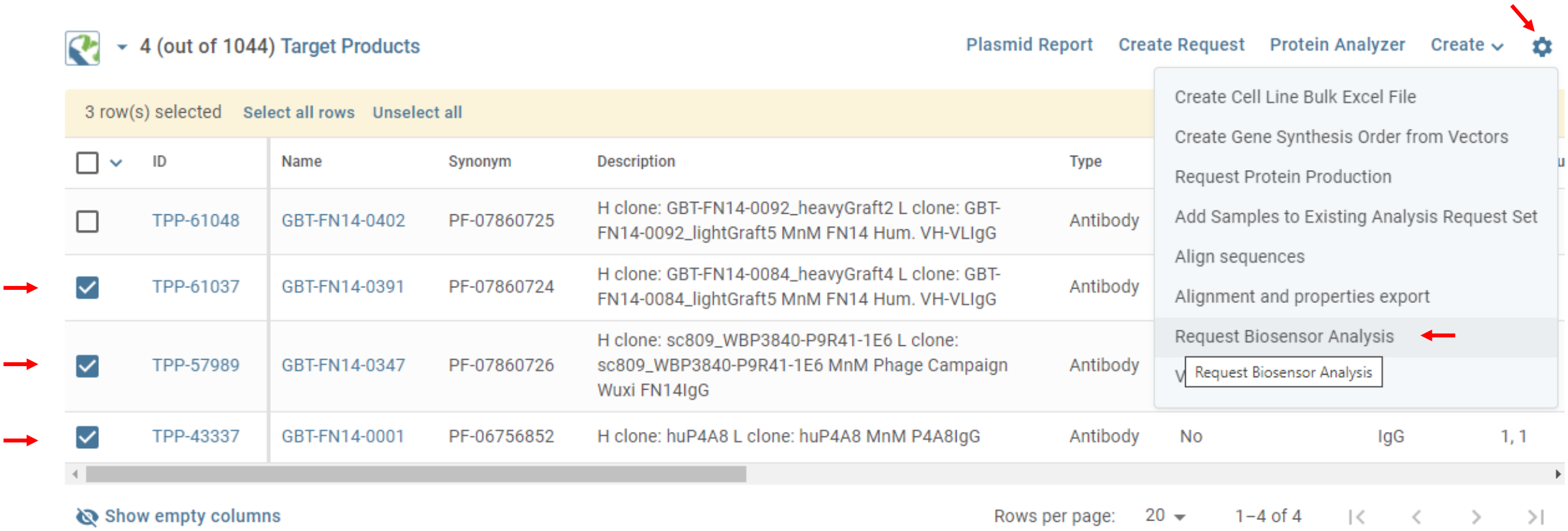


Please note: The aim of this search is to identify the biotherapeutics (example Ab), for Biosensor analysis. It is not necessary to select the other binding partner (example Ag) when creating a Genedata Biosensor request.

3. Creating Biosensor Requests from Target Products (TP)

Select the Target Product Proteins for Biosensor Analysis

Using the Gear Icon, Select 'Request Biosensor Analysis' from the Dropdown List

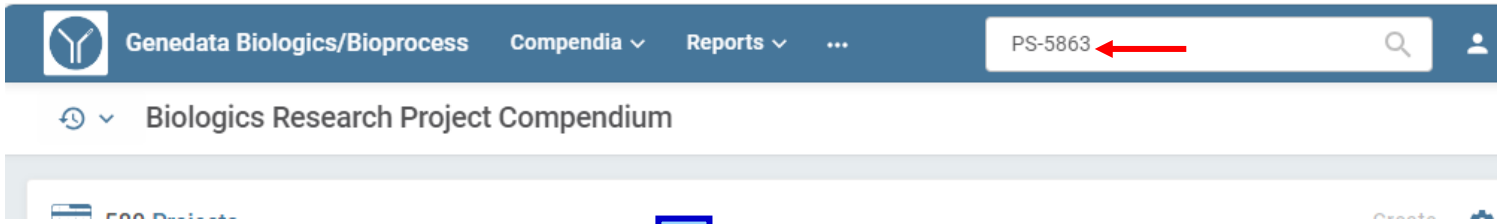


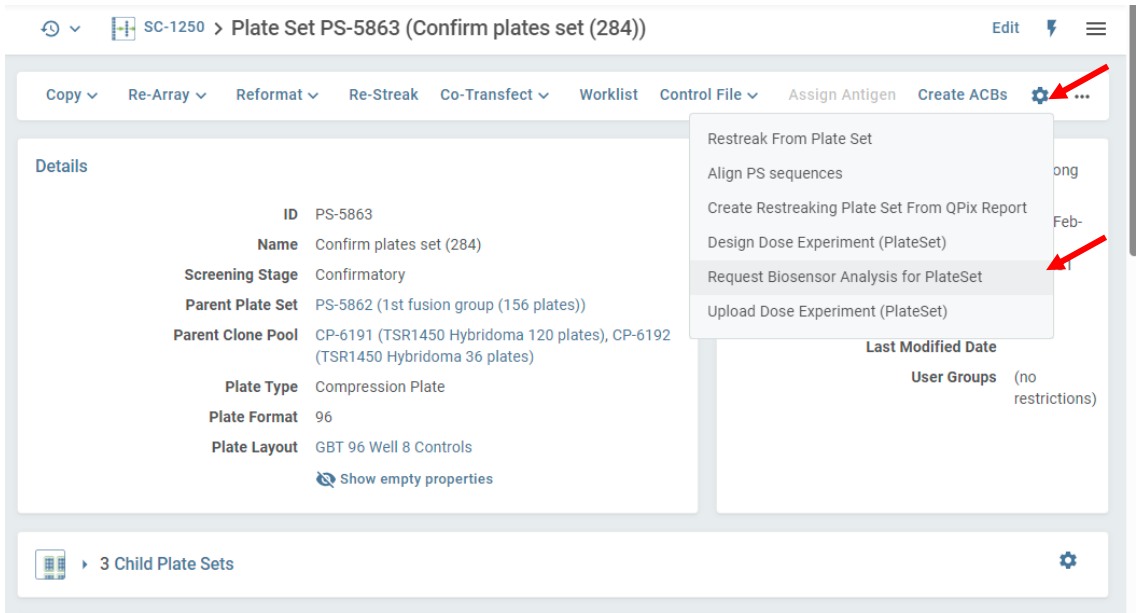
Since only the TPP was selected, the user will have to manually select the specific PPBs for analysis

Creating Biosensor Requests from Unpurified Material (Hybridoma, TAP sups, etc.)

4. Creating Biosensor Requests from Plate Sets (unpurified material)

Search for plate set ID in Genedata Biologics, you can also navigate to the plate set from the screening campaign page





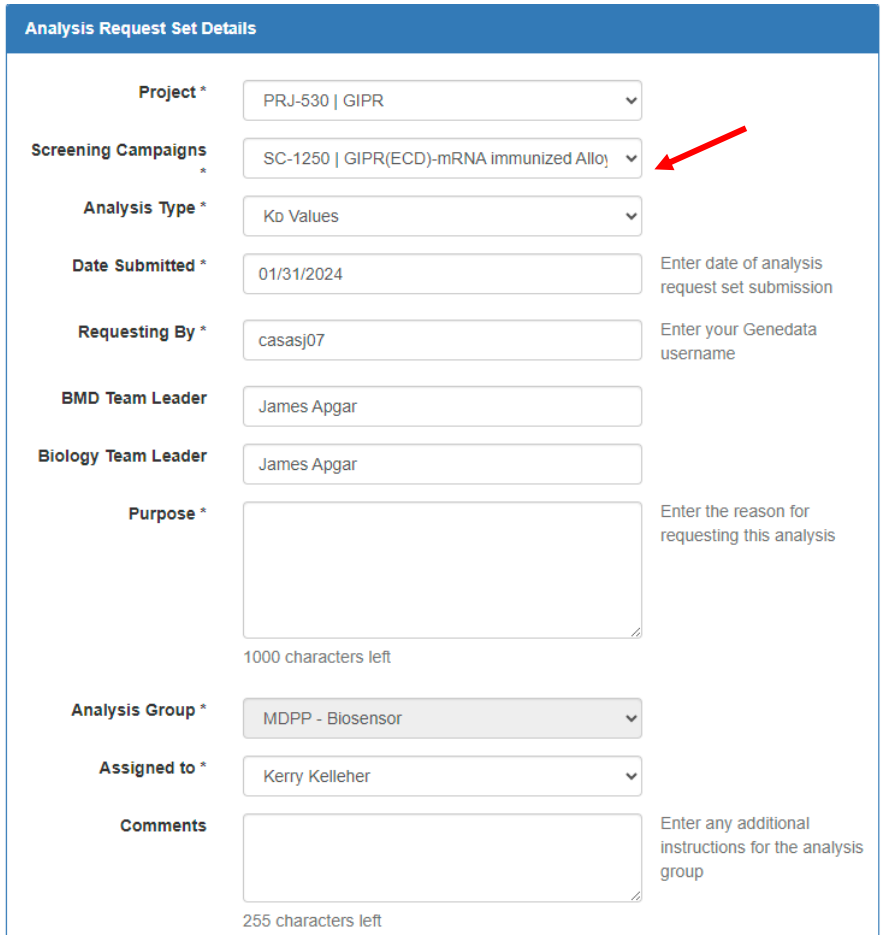
Once on the Plate Set page, select "Request Biosensor Analysis for PlateSet" under the top gear icon

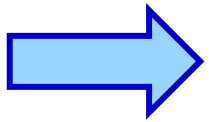
Notes:

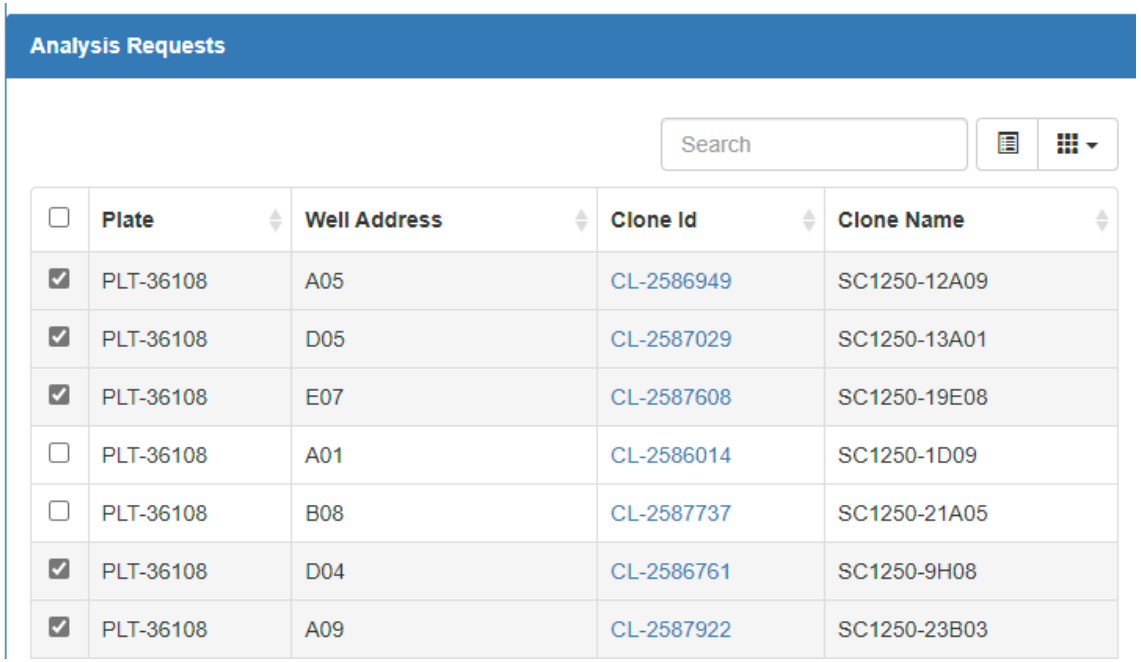
1) **This is the only gear icon on the page which has this option**
2) **Selecting the specific clones under the well contents section will not affect which clones are brought over to the request set (you can specifically select clones in the next step in GDBxT)**

4. Creating Biosensor Requests from Plate Sets (unpurified material)

Enter ARS Details, note that a new screening campaign field is added

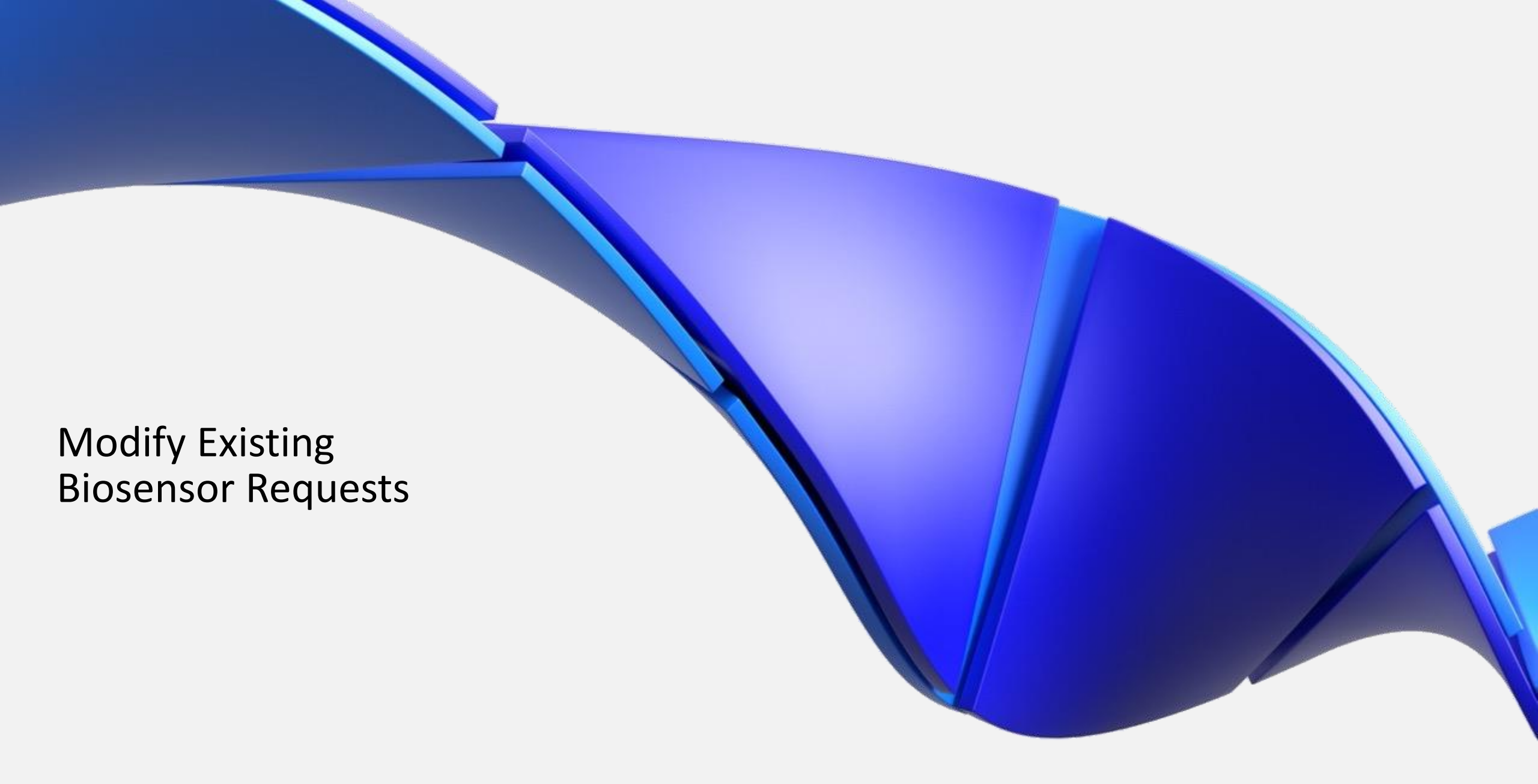






Scrolling below the ARS details, you can select the clones you want added to the ARS and press create ARS at the bottom of the page. Note that for plate sets, the unique identifiers in the database are the plate ID and well address.

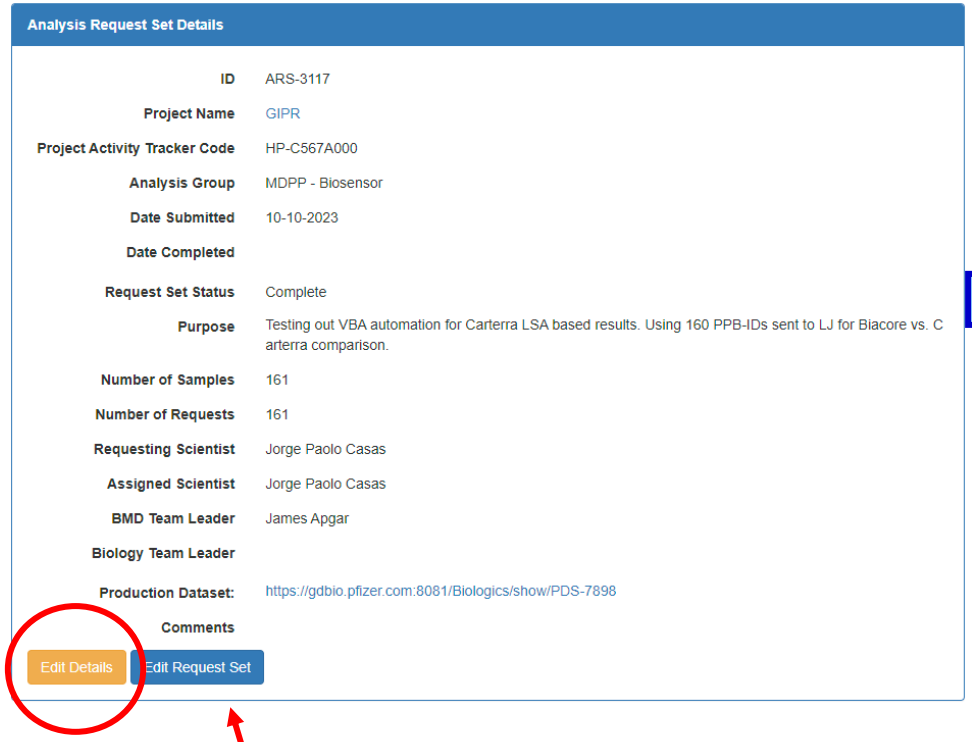
Modify Existing Biosensor Requests



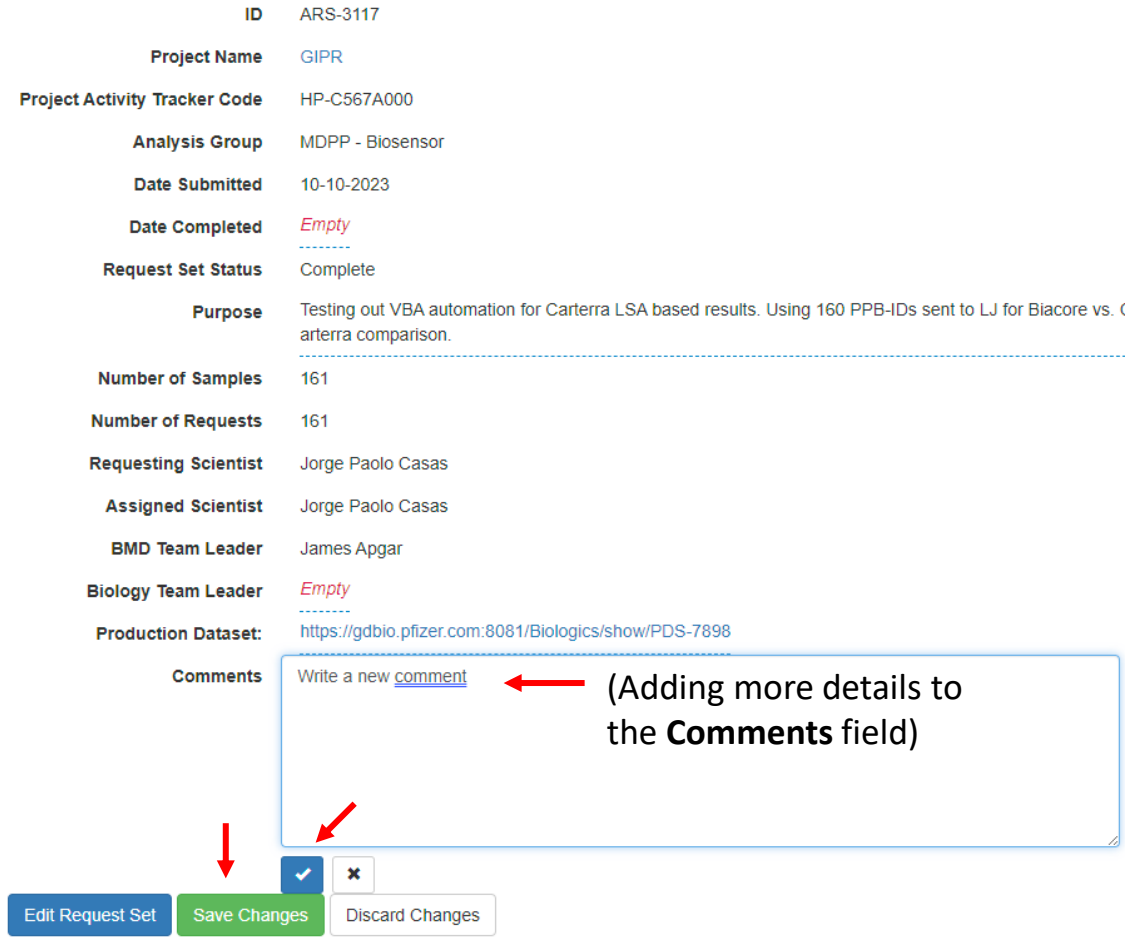
Editing Biosensor Request Set Details

Select the ‘Edit Details’ Button on the Analysis Request Set Details Page

After Editing, Select the Check Mark Button, then the ‘Save Changes’ Button



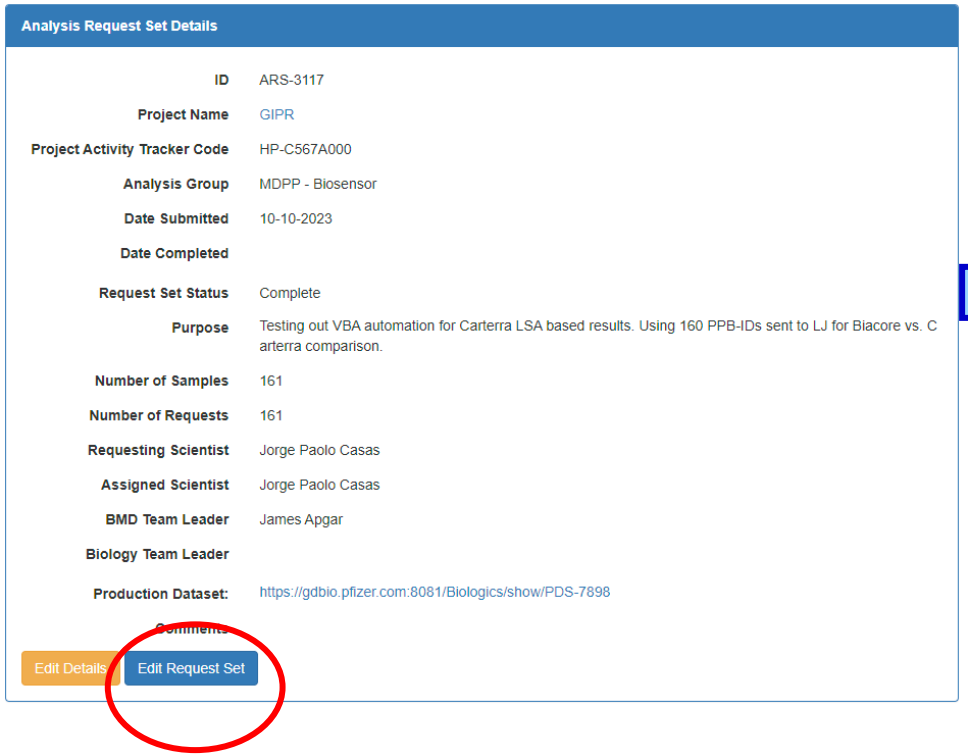
This button will allows for Biosensor group addition of binding partner (s) and control (s), covered in next slide

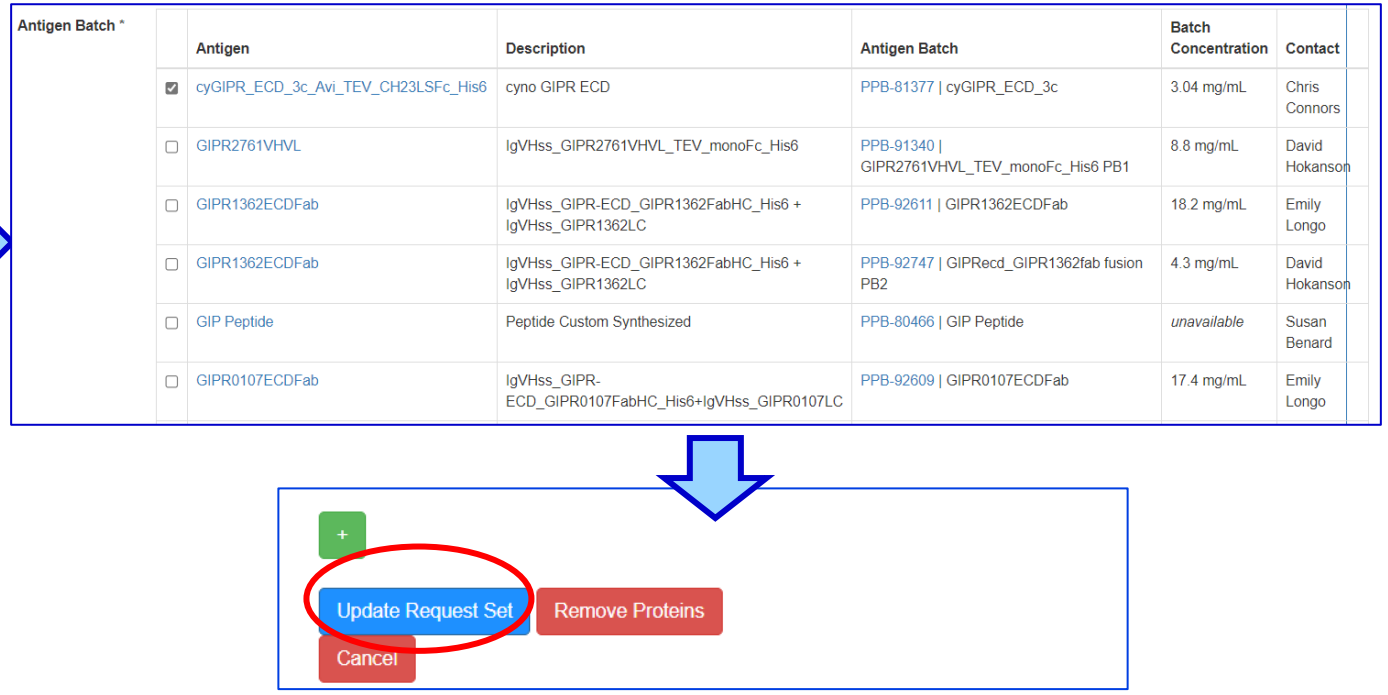


Adding Binding Partner/Antigen

Select the ‘Edit Request Set’ Button on the Analysis Request Set Details Page

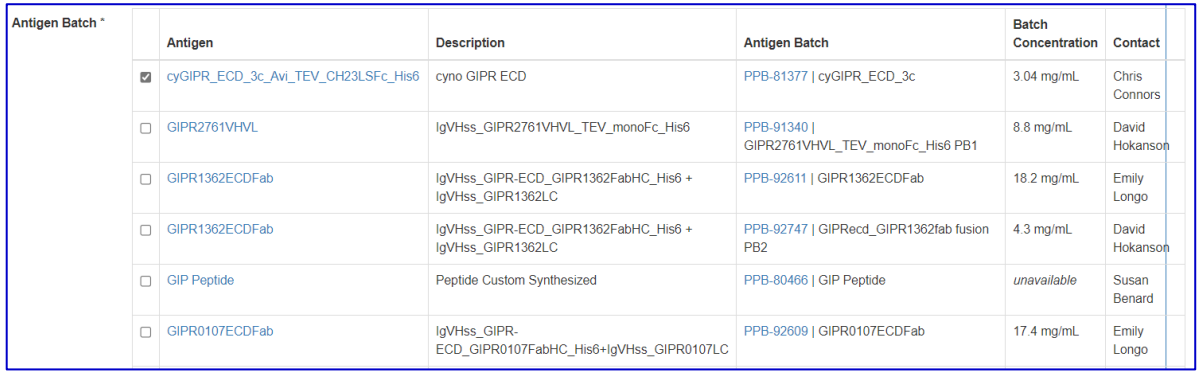
Select checkbox corresponding to correct antigen, PPB-ID and concentration have been provided to facilitate selection





Scroll to bottom of page and press “update request set”, now the requests on the main ARS page should display both the ligand and the analyte to complete the pairing

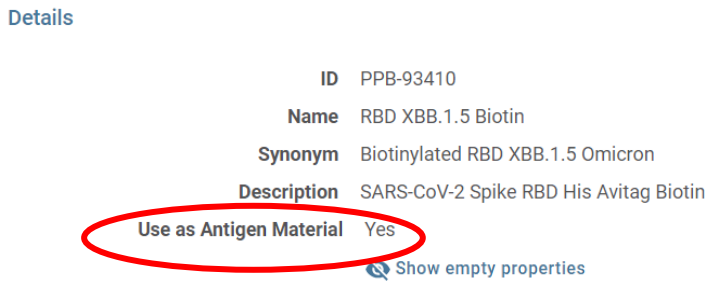
Troubleshooting Adding Binding Partners or Controls



Antigen Batch *

	Antigen	Description	Antigen Batch	Batch Concentration	Contact
☑	cyGIPR_ECD_3c_Avi_TEV_CH23LSFc_His6	cyno GIPR ECD	PPB-81377 | cyGIPR_ECD_3c	3.04 mg/mL	Chris Connors
☐	GIPR2761VHVL	IgVHss_GIPR2761VHVL_TEV_monoFc_His6	PPB-91340 | GIPR2761VHVL_TEV_monoFc_His6 PB1	8.8 mg/mL	David Hokanson
☐	GIPR1362ECDFab	IgVHss_GIPR-ECD_GIPR1362FabHC_His6 + IgVHss_GIPR1362LC	PPB-92611 | GIPR1362ECDFab	18.2 mg/mL	Emily Longo
☐	GIPR1362ECDFab	IgVHss_GIPR-ECD_GIPR1362FabHC_His6 + IgVHss_GIPR1362LC	PPB-92747 | GIPRecd_GIPR1362fab fusion PB2	4.3 mg/mL	David Hokanson
☐	GIP Peptide	Peptide Custom Synthesized	PPB-80466 | GIP Peptide	*unavailable*	Susan Benard
☐	GIPR0107ECDFab	IgVHss_GIPR-ECD_GIPR0107FabHC_His6+IgVHss_GIPR0107LC	PPB-92609 | GIPR0107ECDFab	17.4 mg/mL	Emily Longo

If you do not see the desired antigen in the table, ensure that the "Use as Antigen Material" field is marked as "Yes" in the PPB page on Genedata for the antigen to populate in table

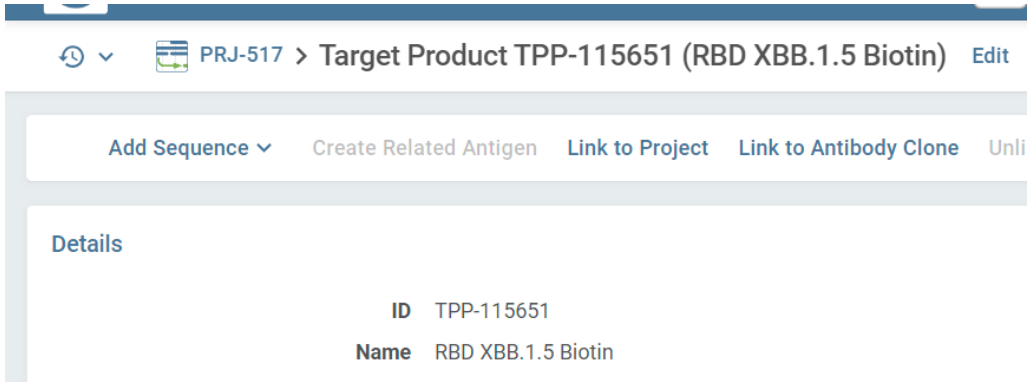


Details

ID	PPB-93410
Name	RBD XBB.1.5 Biotin
Synonym	Biotinylated RBD XBB.1.5 Omicron
Description	SARS-CoV-2 Spike RBD His Avitag Biotin
Use as Antigen Material	Yes

Show empty properties

If you need to add a control sample from a different project to the ARS, you will need to link it's TPP to your current project



PRJ-517 > Target Product TPP-115651 (RBD XBB.1.5 Biotin) Edit

Add Sequence | Create Related Antigen | Link to Project | Link to Antibody Clone | Unli

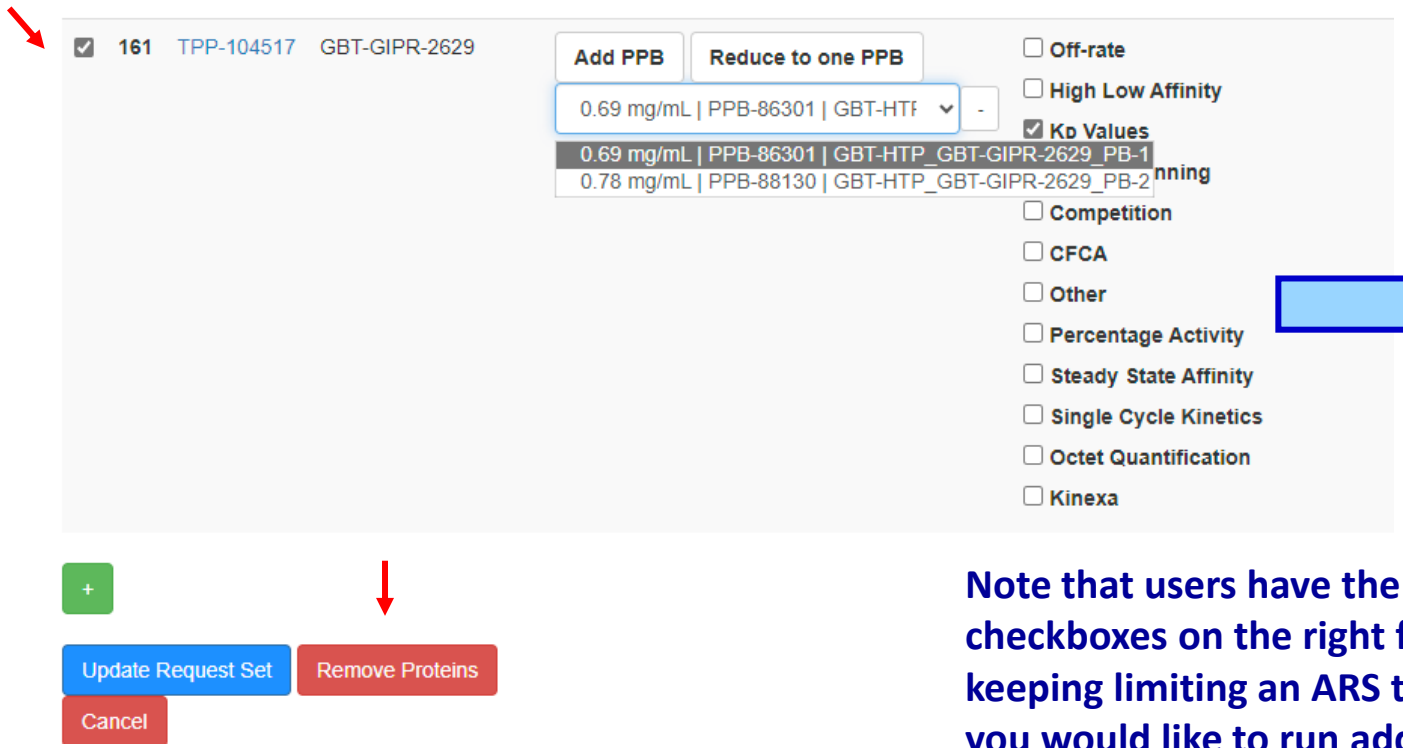
Details

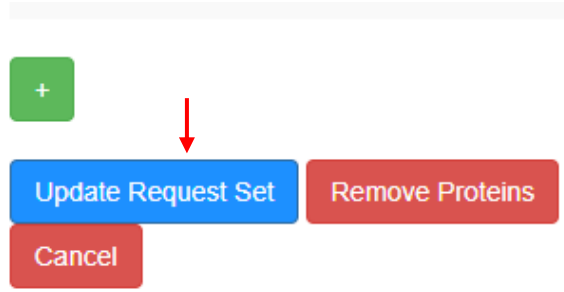
ID	TPP-115651
Name	RBD XBB.1.5 Biotin

Deleting Requests within a Request Set Details

Select the Request (s) to Delete

Select the ‘Remove Proteins’ Button then the ‘Create Request Set’ Button

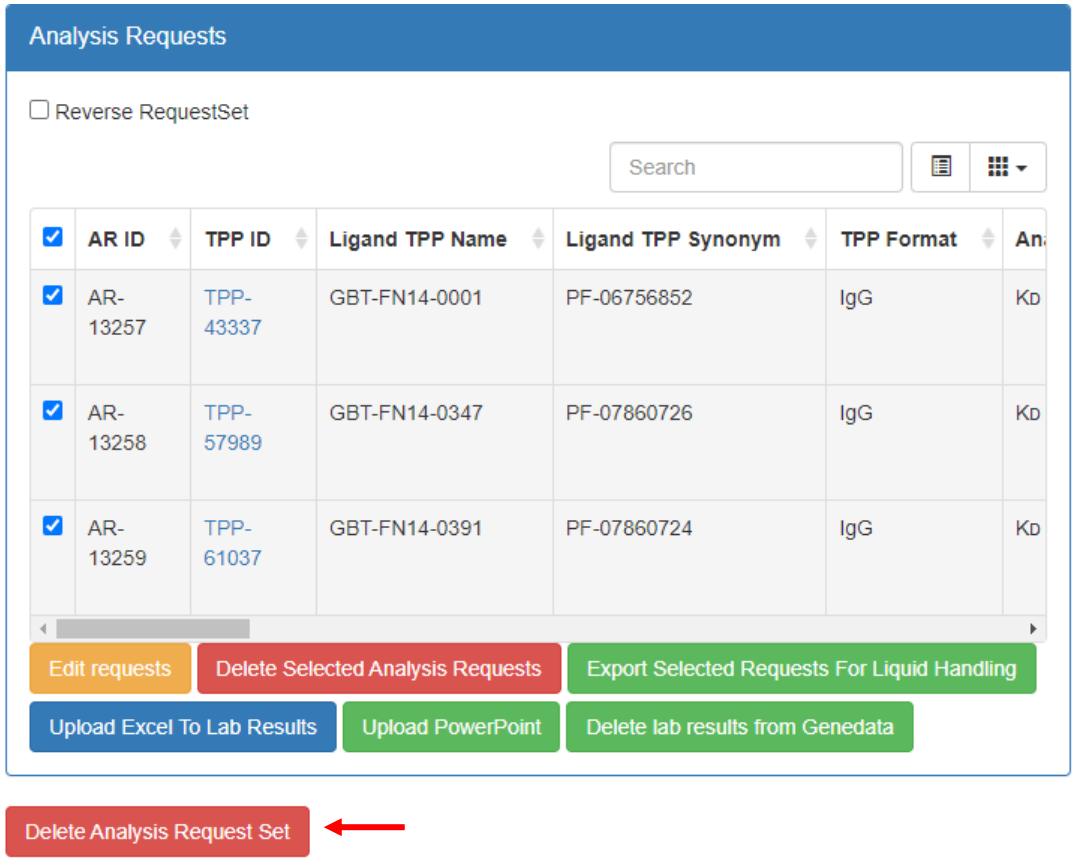




Note that users have the option to select multiple analysis types using the checkboxes on the right for a particular TPP. However, we have found that keeping limiting an ARS to a single assay type to a single type works best. If you would like to run additional assays on the same samples, then you can create new ARS.

Deleting a Request Set within Request Set Details

To Delete a Submitted Request, Select the ‘Delete Analysis Request Set’ Button

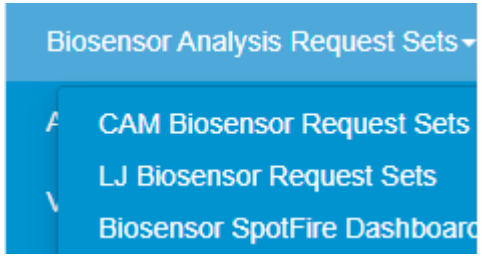


The “Reverse RequestSet” button is provided in the event you plan on reversing the assay (i.e. on the Biacore you would capture the analyte and flow the ligand over the surface).
Pressing this button will cause the biotherapeutic samples to be listed under the analyte column and the antigen/binding partner under the ligand column. However, we have experienced complications uploading our data when this button is pressed so we tend to leave this button unchecked and reverse the samples in our custom macro.

Viewing Genedata Biosensor Assay Results

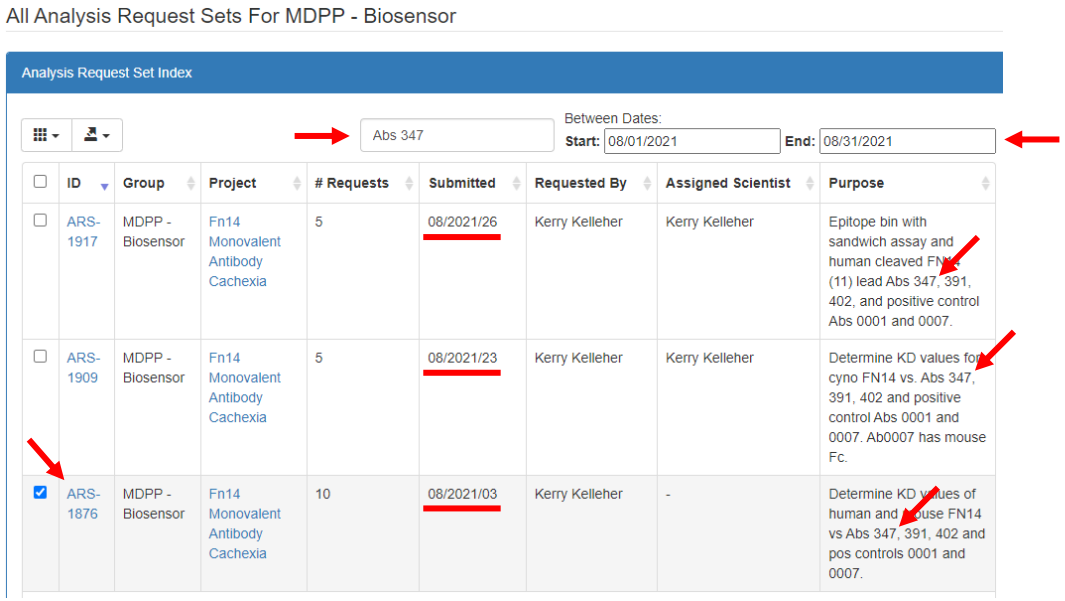
Viewing Biacore Kinetic Assay Results on the Request Set Details Page

Select the appropriate biosensor requests page from the biosensor analysis request sets drop down menu in GDBxT



Search for the ARS with Text (exact match) and Date Field Parameters

Select the ARS ID

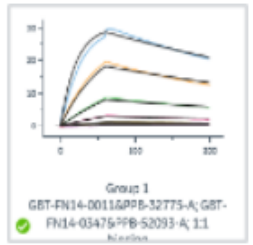
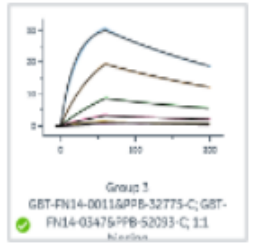
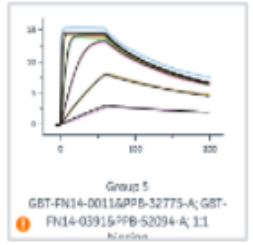


Viewing Biacore Kinetic Assay Results on the Request Set Details Page

Analysis Request Set 1876

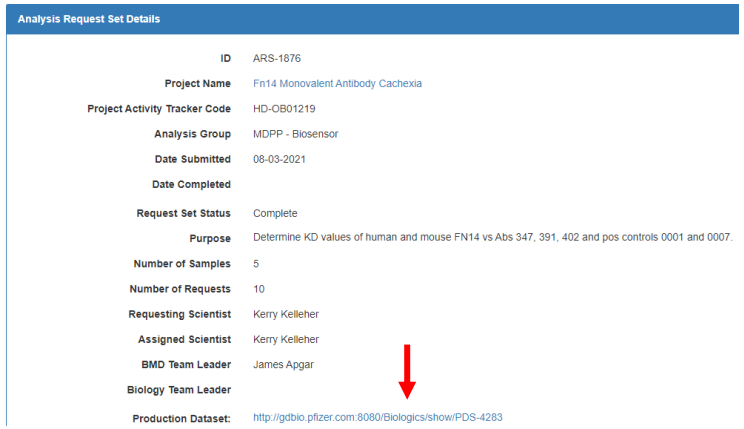
Analysis Request Set Details

Results Biacore KD

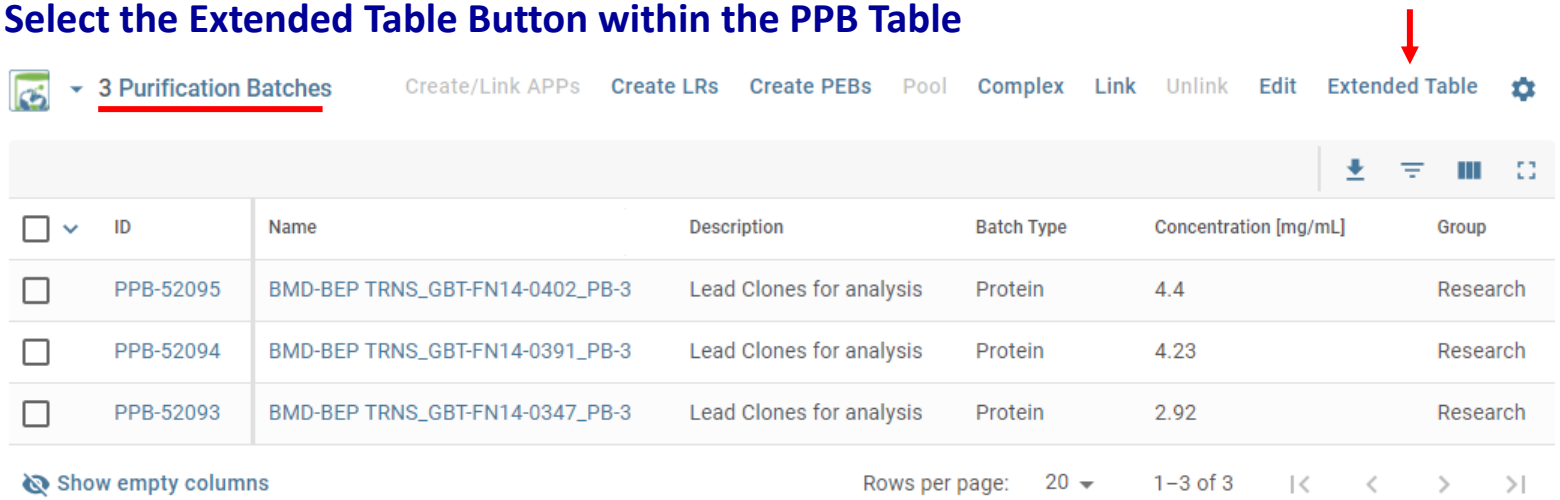
Id	Name	Analyzed Entity ID	Measurement Type	Grouping Criterion	--Timestamp--	Orientation	ka (1/Ms)	kd (1/s)	KD (pM)	t1/2 (s)	Rmax (RU)	Chi² (RU²)	Chi²/Rmax (%)	Trace	Binding Partner
LR-172617	BMD-BEP TRNS_GBT-FN14-0347_PB-3 BMD - TPS_GBT-FN14-0011_PB-1_KD-A-1	PPB-52093	Biacore KD	BMD - TPS_GBT-FN14-0011_PB-1	2021-08-13 00:00:00.0	TPP as ligand	5.18E5	2.26E-3	4360.00	3.07E2	31.90	4.61E-1	1.45		PPB-32775
LR-172618	BMD-BEP TRNS_GBT-FN14-0347_PB-3 BMD - TPS_GBT-FN14-0011_PB-1_KD-C-1	PPB-52093	Biacore KD	BMD - TPS_GBT-FN14-0011_PB-1	2021-08-13 00:00:00.0	TPP as ligand	5.54E5	3.36E-3	6060.00	2.06E2	33.50	3.99E-2	.12		PPB-32775
LR-172619	BMD-BEP TRNS_GBT-FN14-0391_PB-3 BMD - TPS_GBT-FN14-0011_PB-1_KD-A-1	PPB-52094	Biacore KD	BMD - TPS_GBT-FN14-0011_PB-1	2021-08-13 00:00:00.0	TPP as ligand	3.58E7	9.79E-3	274.00	7.08E1	14.60	1.47E-1	1.00		PPB-32775

Viewing Biacore Kinetic Assay Results from the Production Dataset (PDS) Page

Select the Production Dataset link on the Biosensor Request Set Details Page



Select the Extended Table Button within the PPB Table



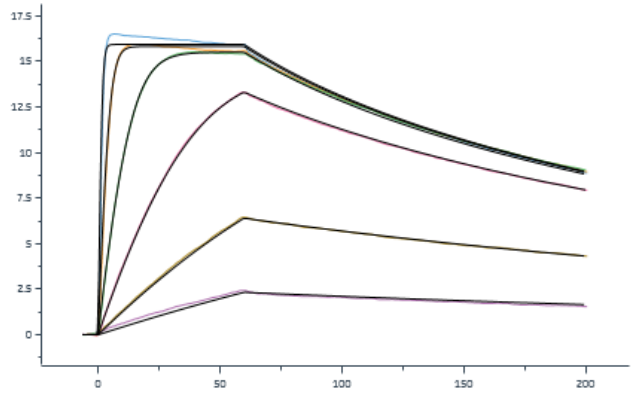
Viewing Biacore Kinetic Assay Results from the Production Dataset (PDS) Page

Select the Sensorgram for Zoom View

Laboratory Results for 3 Purification Batches

(Aggregate Lab Results for PPB in addition to Biacore Assay)

	Purification Batch		Analytical HIC : 1	Biacore KD : BMD - TPS_GBT-FN14-0011_PB-1				
ID	Name	Target Product I...	Percent Main Peak [%]	Orientation (list)	ka (1/Ms) [1/(...	kd (1/s) [...	KD (nM) [n...	Trace (list)
PPB-52095	BMD-BEP TRNS_GBT-FN14-0402_PB-3	TPP-61048	100.0	TPP as ligand, TPP as ligand	1.54E7	5.2E-3	3.42E-1	
PPB-52094	BMD-BEP TRNS_GBT-FN14-0391_PB-3	TPP-61037	100.0	TPP as ligand, TPP as ligand	4.48E7	1.12E-2	2.56E-1	

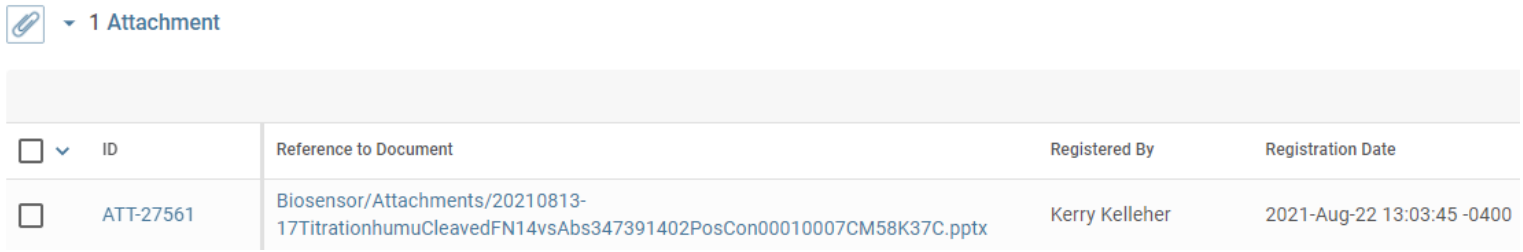


Group 11
GBT-FN14-0011&PPB-32775-C; GBT-FN14-0402&PPB-52095-C; 1:1 binding

Viewing Biacore PowerPoint Report Results from the Production Dataset (PDS) Page

Select the ‘Attachment’ Button

Select the Reference to Document File Name to View the Biosensor PowerPoint Report



Biosensor PowerPoint Report