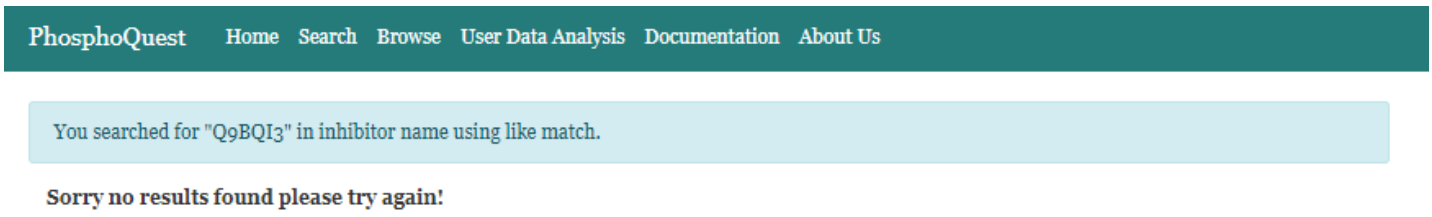
Web App Testing

This document displays a number of example searches that constitute our web app testing. Web app testing was performed using a number of test inputs under the 'similar matches' and 'exact matches' options. The results of both are listed for each search. As a rule of thumb, if any search is performed under the wrong selection options, or with an input that was not present in the database, the following message would be displayed e.g. searching for a something as an inhibitor when it is not:-



Searching via 'similar matches' and 'exact matches' options

i) Searching for kinase accession number e.g. Q9BQI3

ii) est case scenario 2 = Searching for kinase accession name - HRI

iii) Test case scenario 3 = Searching for substrate via accession name e.g. P01236

iv) Test case scenario 4 = Searching for kinase accession name - e.g. PRL

v) Test case scenario 5 = Searching for Inhibitors via accession number e.g. 4877

vi) Test case scenario 6 = Searching for Inhibitors via name e.g. (5Z)-7-Oxozeaenol

Test case scenario 1 = Searching for kinase accession number e.g. Q9BQI3

'Similar Matches' option

PhosphoQuest Home Search Browse User Data Analysis Documentation About Us

Search by name or accession number for Kinases, Substrates or Inhibitors.

This search function allows you to search the PhosphoQuest database useing the parameters below. from the results pages of the search you will be able to continue your Quest by following links to further related information.

Select which information to search.

◉ **Kinases** ○ **Substrates** ○ **Inhibitors**

Select search by accession number (ID) or name

◉ **Accession or ID** ○ **Name**

Enter Search text

Q9BQI3

Choose search type: similar matches ▼

Search

Browse Database

- Kinases
- Substrates
- Inhibitors
- Documentation

Results for Q9BQI3 and related Phosphosites

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You searched for "Q9BQI3" in kinase acc_no using like match.

Kinase Search Result - Record Detail

Accession no	Q9BQI3
Short name	HRI
Full name	Eukaryotic translation initiation factor 2-alpha kinase 1
Gene	EIF2AK1
Species	human
Cellular location	Cytoplasm {ECO:0000250}.
Family	Protein kinase superfamily, Ser/Thr protein kinase family, GCN2 subfamily

Phosphosites related to Kinase-Q9BQI3

Scroll down past table for related Inhibitors

Group ID	Modified Residue	Phosphorylation Site	Domain	Function	Detail
447635	S52	MILLsELsRRRIRsI	S1	activity, induced; molecular association, regulation; activity, inhibited	Detail
450210	S49	IEGMILLsELsRRRI	S1	molecular association, regulation	Detail

Inhibitors related to Kinase-Q9BQI3

No Items

Selecting one of the Group IDs (e.g. 447635) leads to a detailed display of this particular group of phosphosites.

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Phosphosite Search Result - Record Detail

Group ID	447635
Modified residue	S52
Phosphosite	MILLsELsRRRIRsI
Phosphorylation domain	S1
CST Catalog number	3597; 9721; 3398; 5199
Phosphorylation Function	activity, induced; molecular association, regulation; activity, inhibited
Processes	apoptosis, induced; translation, altered; autophagy, induced; RNA splicing, induced; apoptosis, inhibited; translation, induced; cell growth, altered; translation, inhibited
Protein Interactions	eIF2-beta(INDUCES); PERK(INDUCES); CELF1(INDUCES)
Other interactions	
References	11432733; 12370288; 16288713; 16717090; 16952278; 17553788; 17998206; 19934253; 20660158; 25660019; 25759478; 26100016; 27409837; 28683312; 7641700
Notes	
Related substrate	P05198

Kinases related to Phosphosite-447635

Accession no	Full name	Gene	Detail
Q9BQI3	Eukaryotic translation initiation factor 2-alpha kinase 1	EIF2AK1	Detail
P19525	Interferon-induced, double-stranded RNA-activated protein kinase	EIF2AK2	Detail
Q16539	Mitogen-activated protein kinase 14	MAPK14	Detail
P28482	MAP kinase ERK2	MAPK1	Detail
Q9NZJ5	Eukaryotic translation initiation factor 2-alpha kinase 3	EIF2AK3	Detail
P51812	Ribosomal protein S6 kinase alpha 3	RPS6KA3	Detail

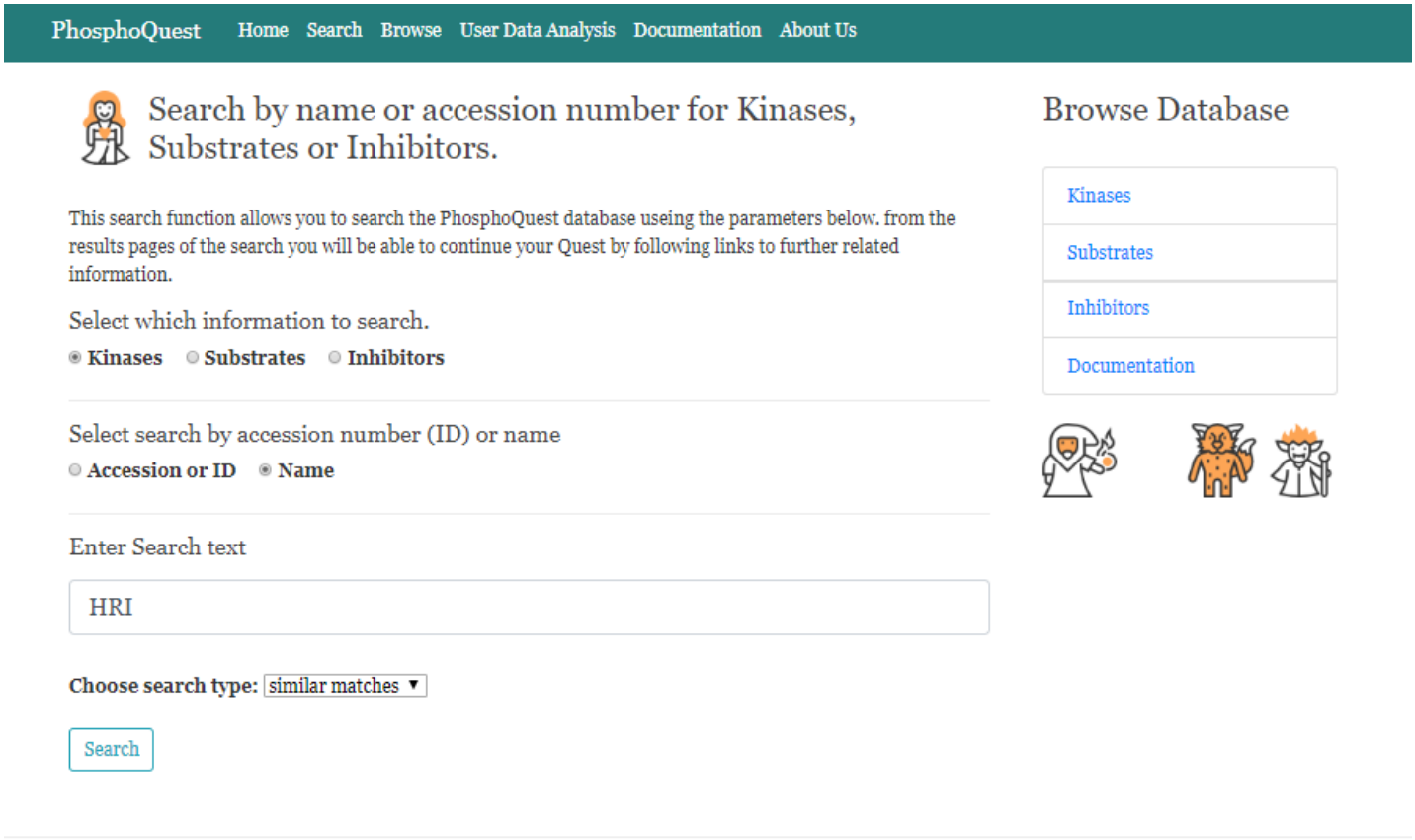
Here we also see a list of kinases which are related to this specific phosphosite (447635). In this list we can observe the original kinase (Q9BQI3) which we had searched for, allowing us to link back to the original search.

'Exact Matches' option

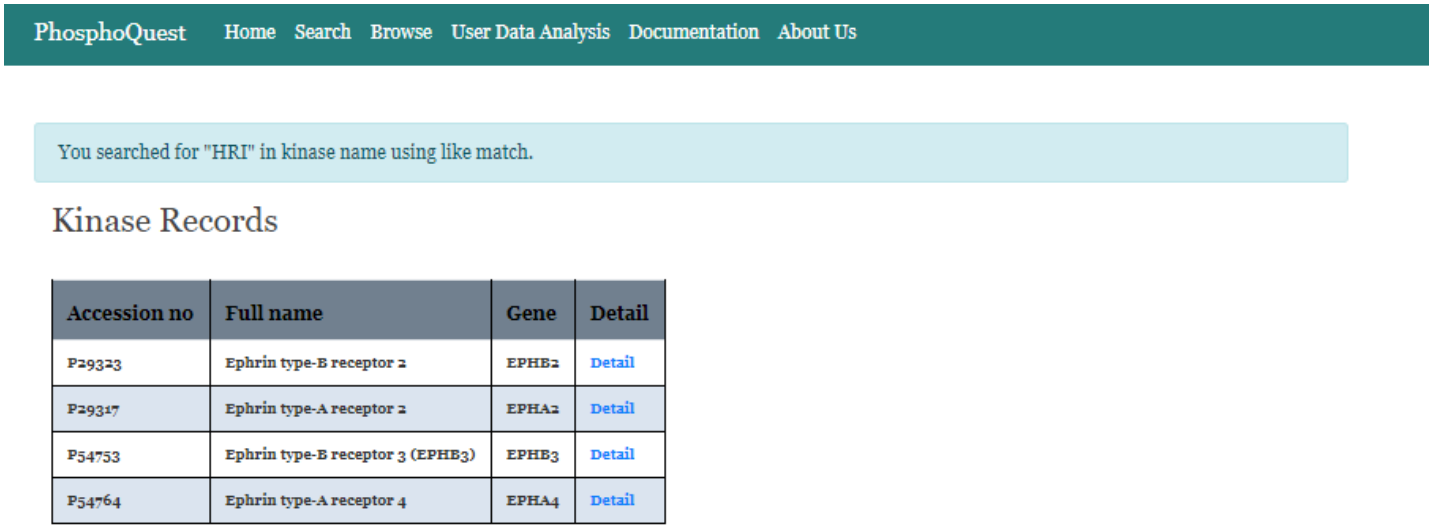
For the exact matches option, the identical results were observed.

Test case scenario 2 = Searching for kinase accession name - HRI

'Similar Matches' option



Results for HRI and kinase records.



Selecting one of the specific kinase accession numbers e.g. P29323 gives further detailed information regarding that particular kinase.

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Kinase Search Result - Record Detail

Accession no	P29323
Short name	EphB2
Full name	Ephrin type-B receptor 2
Gene	EPHB2
Species	human
Cellular location	Cell membrane; Single-pass type I membrane protein. Cell projection, axon {ECO:0000250}. Cell projection, dendrite {ECO:0000250}.
Family	Protein kinase superfamily, Tyr protein kinase family, Ephrin receptor subfamily

Phosphosites related to Kinase-P29323

Scroll down past table for related Inhibitors

Group ID	Modified Residue	Phosphorylation Site	Domain	Function	Detail
448122	Y66	DPTIEDSyTKICSVD	Ras	molecular association, regulation	Detail

Inhibitors related to Kinase-P29323

No Items

From here, one can link to the specific phosphosites related to this particular kinsase. Selecting the detail tab, it is possible to go into the full details of this particular phosphosite:-

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Phosphosite Search Result - Record Detail

Group ID	448122
Modified residue	Y66
Phosphosite	DPTIEDSyTKICSVD
Phosphorylation domain	Ras
Phosphorylation Function	molecular association, regulation
Processes	cell motility, altered; cytoskeletal reorganization; cell adhesion, altered
Protein Interactions	
Other interactions	
References	10570155; 11682467; 16522685
Notes	Y66E blocks activated (38V) R-Ras-induced cell retraction (cells with spikes). Y66F blocks activated R-Ras inhibition of cell migration during ephrin-B1 stimulation (effect present but not as intense in Y66F non-activated R-ras allele). Y66F inhibits ephrin-A1-induced growth cone collapse.
Related substrate	P10301

Kinases related to Phosphosite-448122

Accession no	Full name	Gene	Detail
P29323	Ephrin type-B receptor 2	EPHB2	Detail
P12931	DNA-PK/ Src	SRC	Detail

And from here, one can observe the kinases associated with this phosphosite, and link back to the original EPHB2 search result (Accession number P29323)

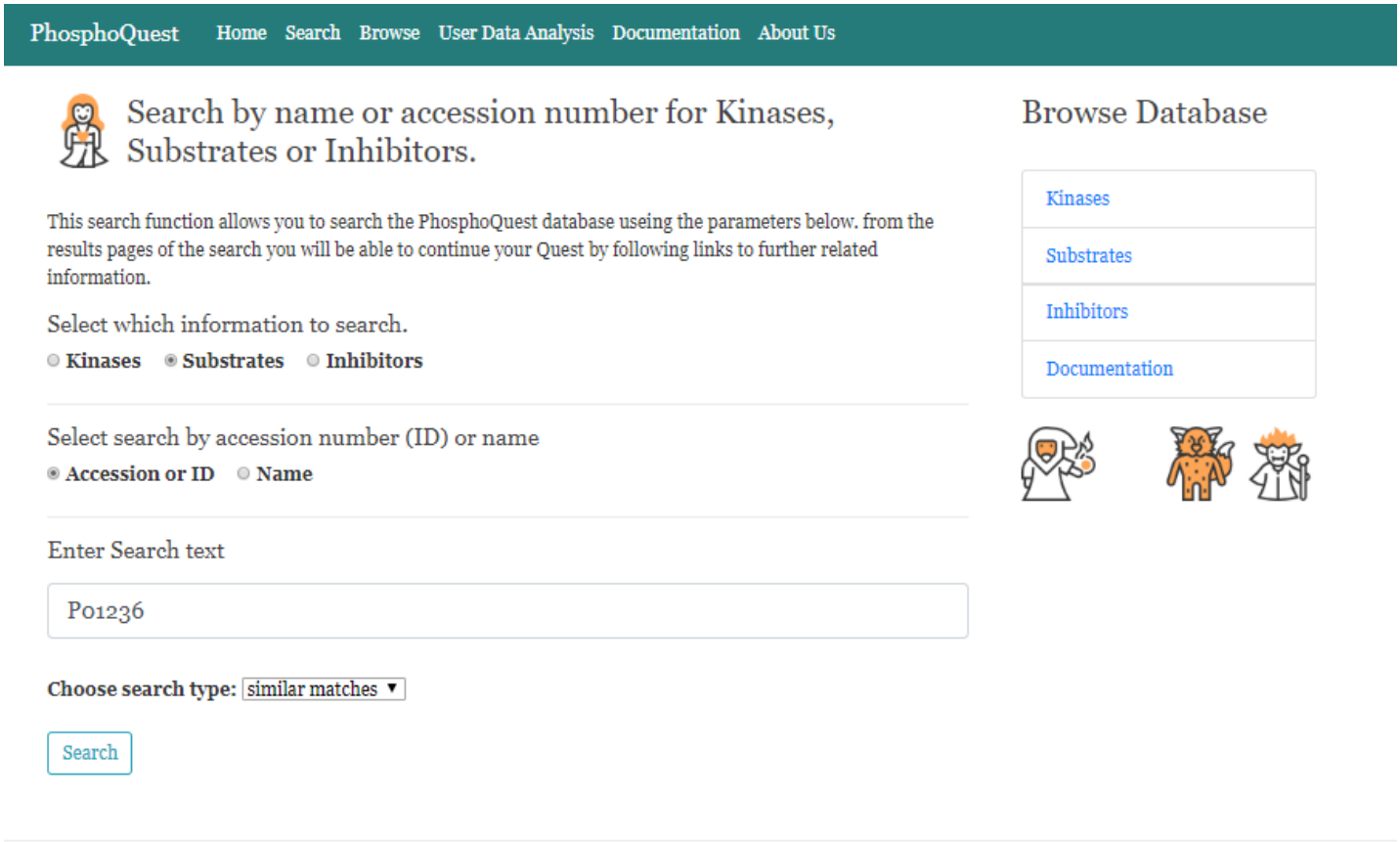
'Exact Matches' option

For the exact matches option, HRI was not detected because the "name searches" utilises kinases = `kin_full_name` , which translates to full name. Thus, searching for HRI will not work in an exact match as this corresponds to gene name. Currently we could only search for one specific field. In the future, we will look to implement multi-field searches to capture different information.

Test case scenario 3 = Searching for substrate via accession name e.g.

P01236

'Similar Matches' option



Results for P01236 and phosphosites related to this particular substrate.

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You searched for "P01236" in substrate acc_no using like match.

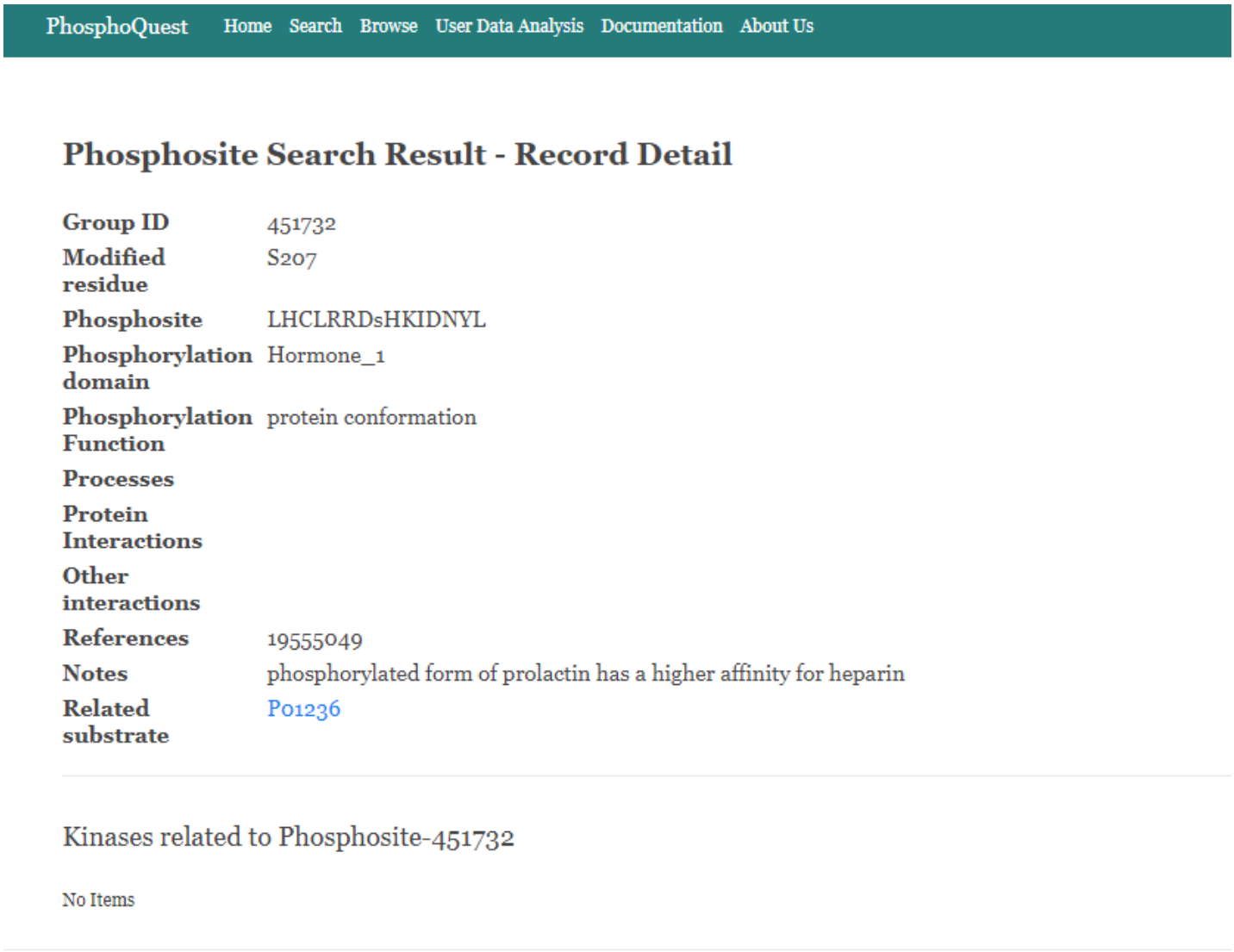
Substrate Search Result - Record Detail

Accession no	P01236
Short name	prolactin
Full name	Prolactin
Protein type	Cytokine; Motility/polarity/chemotaxis; Secreted; Secreted, signal peptide
Molecular weight (kd)	25.88
Gene	PRL
Chromosome location	6p22.3
Species	human

Phosphosites related to Substrate-P01236

Group ID	Modified Residue	Phosphorylation Site	Domain	Function	Detail
451732	S207	LHCLRRDsHKIDNYL	Hormone_1	protein conformation	Detail
455331	S194	ADEESRLsAYYNLLH	Hormone_1		Detail
455332	S163	EGMELIVsQVHPETK	Hormone_1		Detail
17790903	S179	NEIYPVWsGLPSLQM	Hormone_1		Detail

Selecting one of the Group IDs (e.g. 451732) leads to a detailed display of characterisitcs relating to this particular group of phosphosites.



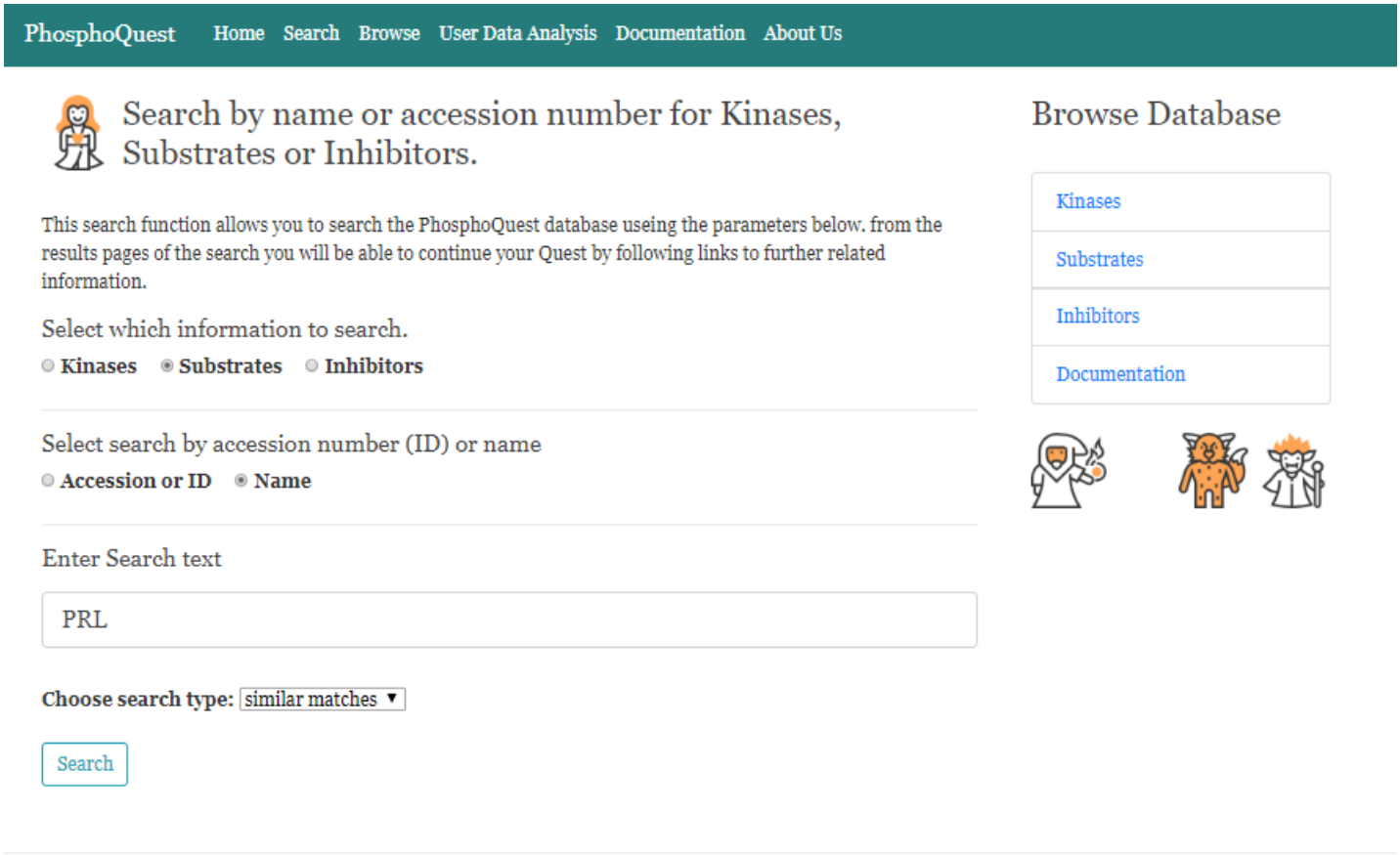
Here, we can view detailed information regarding the selected phosphosite group. We also have the "related substrate" qualifer, and this takes us back to the previous page.

'Exact Matches' option

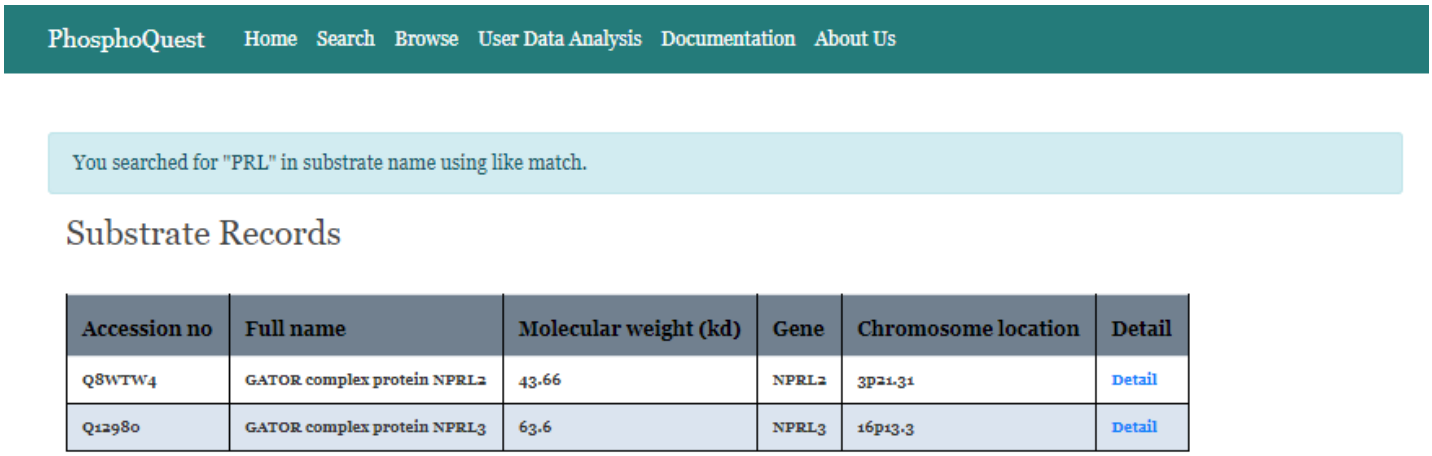
For the exact matches option, the identical results were observed.

Test case scenario 4 = Searching for kinase accession name - e.g. PRL

'Similar Matches' option



Results for PRL substrate records.



Accession no	Full name	Molecular weight (kd)	Gene	Chromosome location	Detail
Q8WTW4	GATOR complex protein NPRL2	43.66	NPRL2	3p21.31	Detail
Q12980	GATOR complex protein NPRL3	63.6	NPRL3	16p13.3	Detail

Selecting one of the specific substrate accession numbers e.g. Q8WTW4 gives further detailed information regarding that particular substrate.

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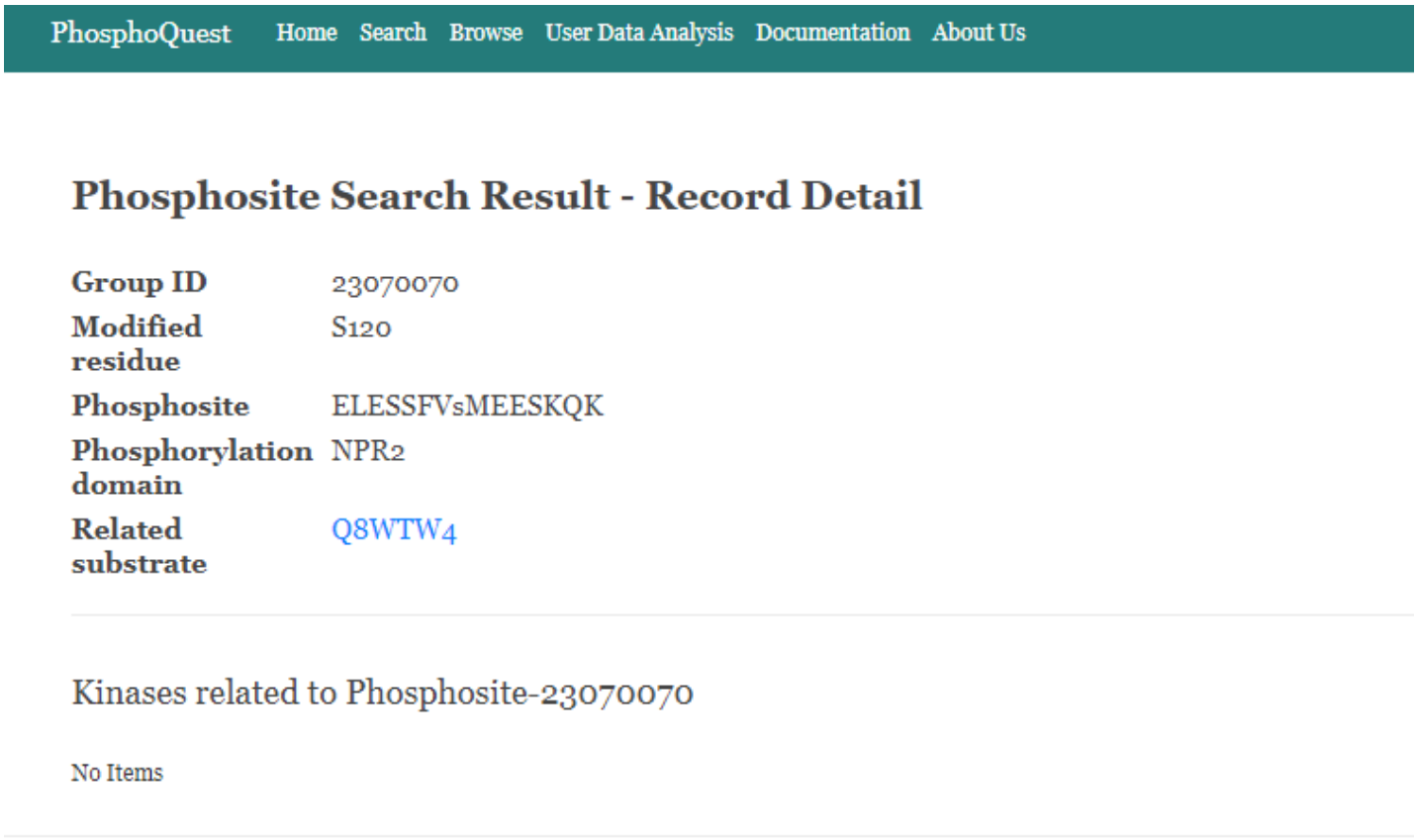
Substrate Search Result - Record Detail

Accession no	Q8WTW4
Short name	NPRL2
Full name	GATOR complex protein NPRL2
Protein type	NPR2 family
Molecular weight (kd)	43.66
Gene	NPRL2
Chromosome location	3p21.31
Species	human

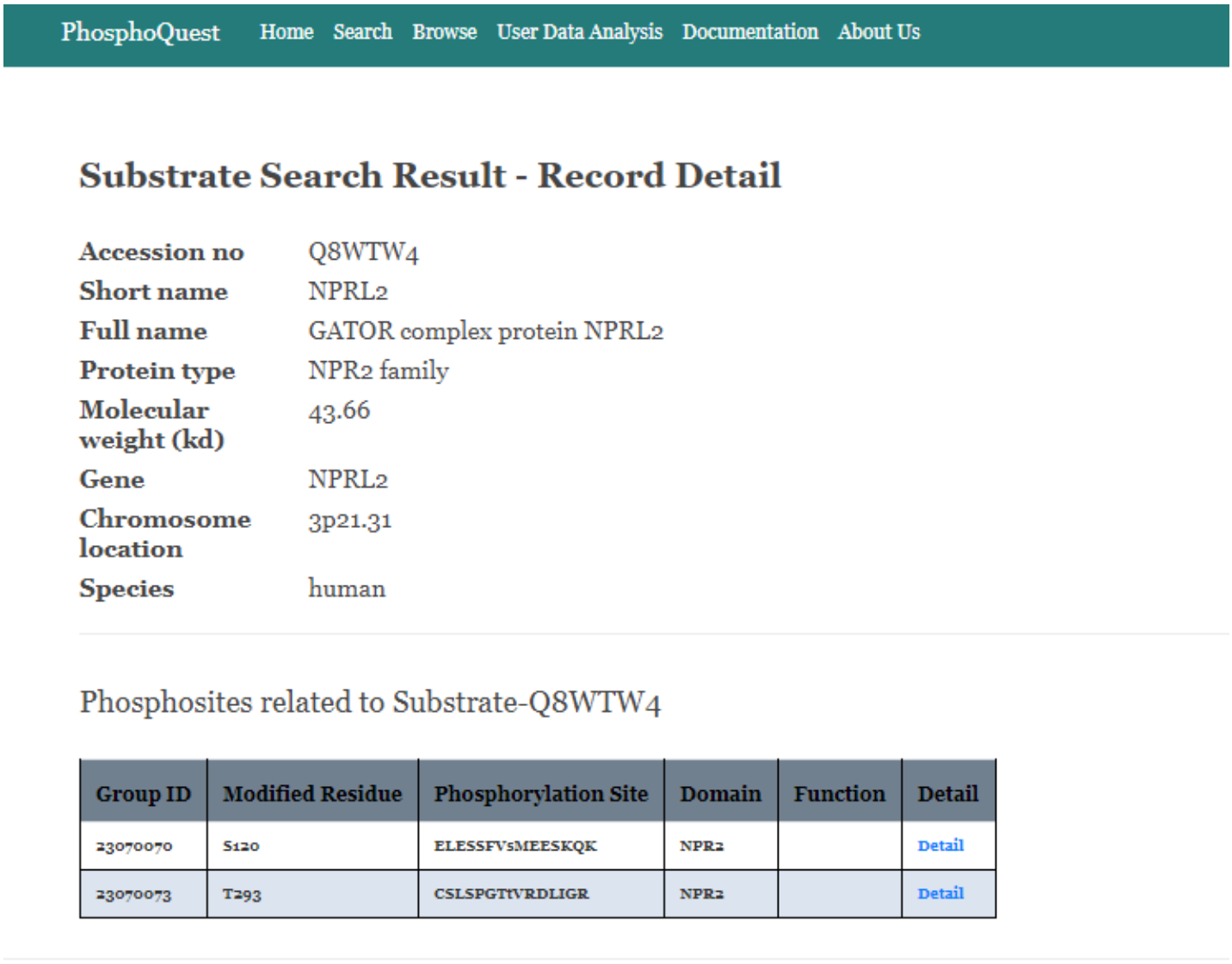
Phosphosites related to Substrate-Q8WTW4

Group ID	Modified Residue	Phosphorylation Site	Domain	Function	Detail
23070070	S120	ELESSFVsMEESKQK	NPR2		Detail
23070073	T293	CSLSPGTtVRDLIGR	NPR2		Detail

From here, one can link to phosphosites related to this particular substrate. Selecting the detail tab, it is possible to view the full details of this particular phosphosite:-



From here, one can select the related substrates and go back to the substrates table.



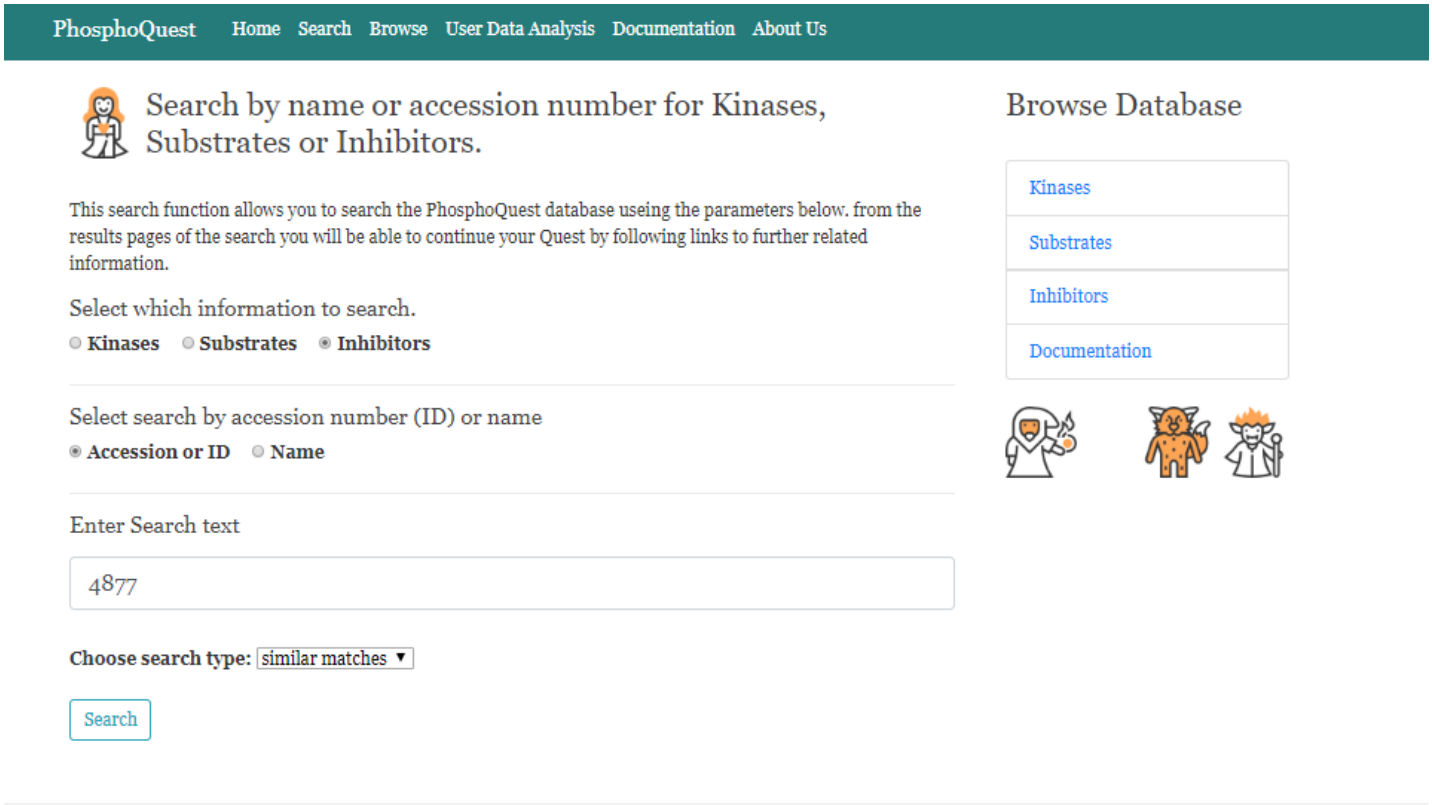
'Exact Matches' option

For the exact matches option, PRL was not detected. The "name searches" utilises substrates = `subs_full_name`, which translates to full name. Thus, searching for PRL will not work in an exact match as this corresponds to gene name. Currently we could only search for one specific field. In the future, we will look to implement multi-field searches to capture different information.

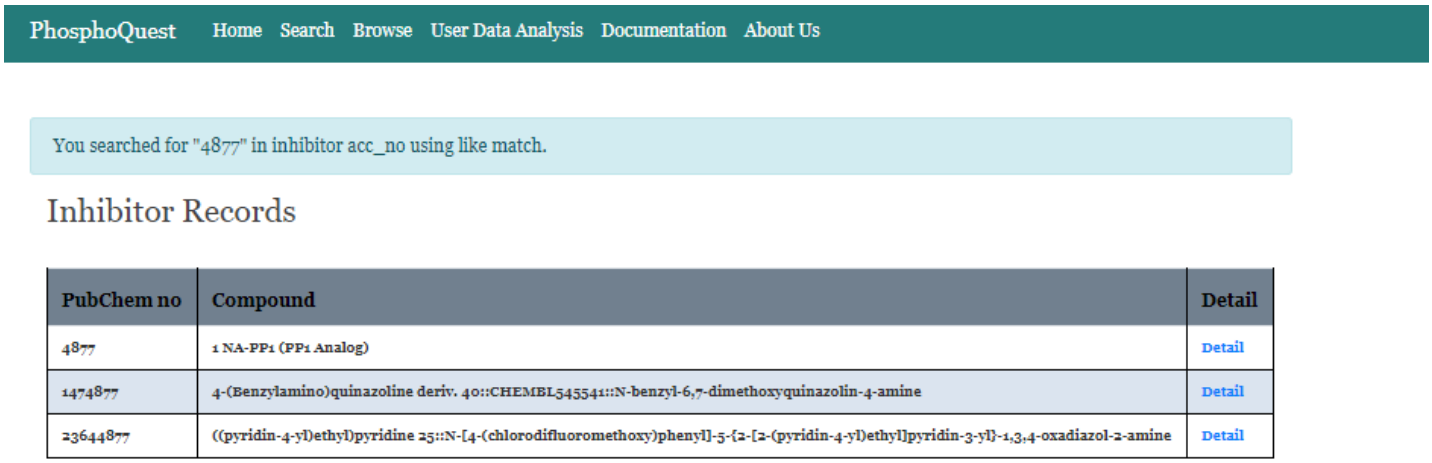
Test case scenario 5 = Searching for Inhibitors via accession number e.g.

4877

'Similar Matches' option



Results for 4877 and a list of potential PubChem numbers.



Selecting one of the Group IDs (e.g. 4877) leads to a detailed display of characterisitcs relating to this particular inhibitor.

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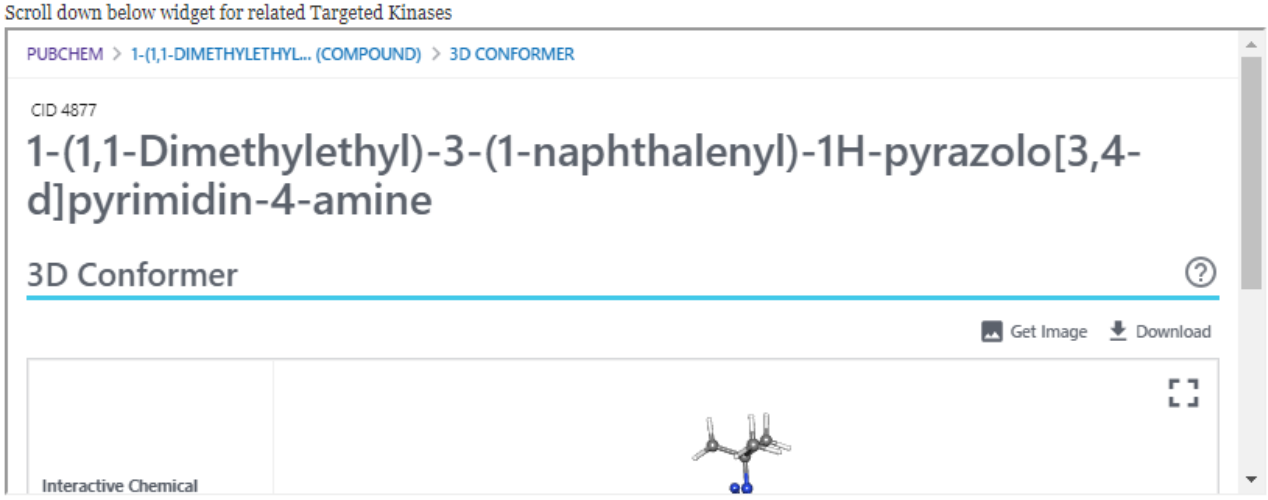
Inhibitor Search Result - Record Detail

PubChem CID	4877
Name	1 NA-PP1 (PP1 Analog)
Full name	1-tert-butyl-3-naphthalen-1-ylpyrazolo[3,4-d]pyrimidin-4-amine
Brutto	C19H19N5
molec. weight (g/mol)	317.4
SMILE	CC(C)(C)N1C2=C(C(=N1)C3=CC=CC4=CC=CC=C43)C(=NC=N2)N
InChI	InChI=1S/C19H19N5/c1-19(2,3)24-18-15(17(20)21-11-22-18)16(23-24)14-10-6-8-12-7-4-5-9-13(12)14/h4-11H,1-3H3,(H2,20,21,22)
InChI key	XSHQBIXMLULFEV-UHFFFAOYSA-N
vendor	Merck (Calbiochem)
Cat. No.	221243-82-9

Scroll down below widget for related Targeted Kinases



Targeted Kinases related to Inhibitor-4877

No Items

'Exact Matches' option

For the exact matches option, the search result did not produce the table of the three options but actually directly displayed the resutls for 4877.

Test case scenario 6 = Searching for Inhibitors via name e.g. (5Z)-7-Oxozeaenol

'Similar Matches' option

PhosphoQuest Home Search Browse User Data Analysis Documentation About Us

Search by name or accession number for Kinases, Substrates or Inhibitors.

This search function allows you to search the PhosphoQuest database useing the parameters below. from the results pages of the search you will be able to continue your Quest by following links to further related information.

Select which information to search.

○ **Kinases** ○ **Substrates** ◉ **Inhibitors**

Select search by accession number (ID) or name

○ **Accession or ID** ◉ **Name**

Enter Search text

(5Z)-7-Oxozeaenol

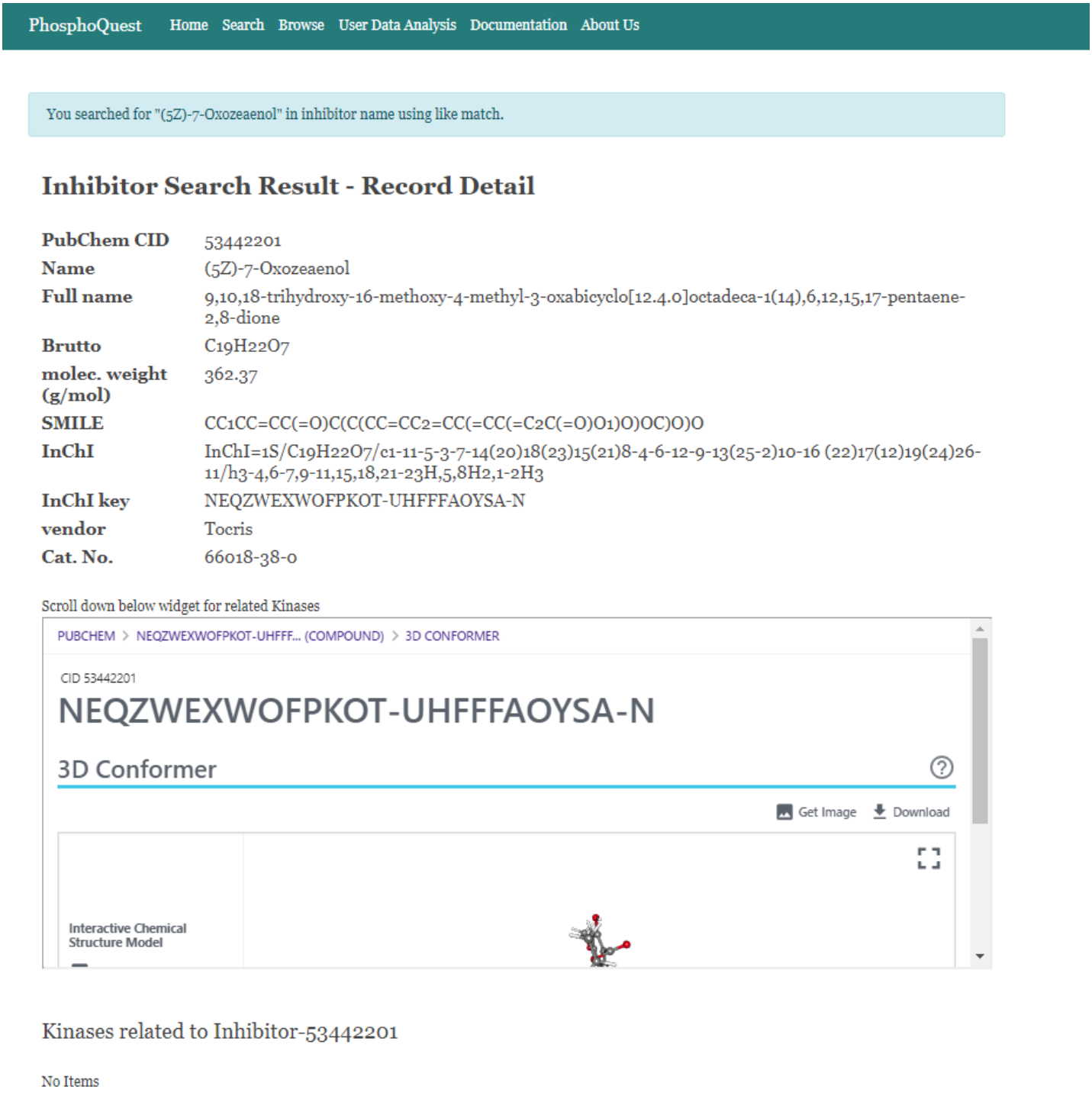
Choose search type: similar matches ▾

Search

Browse Database

- Kinases
- Substrates
- Inhibitors
- Documentation

Results for (5Z)-7-Oxozeaenol.



'Exact Matches' option

For the exact matches option, the identical results were observed. The exact match functioned as expected here since "name searches" utilizes inhibitor - `inhib_name` which translates to 'other name' for inhibitors and this worked successfully for the input used here.

Summary

In this short web app testing, we have tested the pipeline of searches for the six main methods of searches using similar and exact search options:- - Kinase with accession or ID - Kinase with name - Substrate with

accession or ID - Substrate with name - Inhibitor with accession of ID - Inhibitor with name

Currently we there are slight issues for the Kinase and Substrate searches, when names are used, with the 'exact matches' option based upon the field used to search for. In the future, we will look to implement multi-field searches to capture different information. We also tried a number of random character inputs and for all occasions, and this was captured with the default display "sorry no results found".

We have tried to graphically illustrate the results of such searches and demonstrate that all links and searches work as expected. In the future we hope to implement an even more comprehensive web app testing document.