

# 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:-

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You searched for "Q9BQI3" in inhibitor name using like match.

**Sorry no results found please try again!**

## 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



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

This search function allows you to search the PhosphoQuest database using 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 ▾

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Results for Q9BQI3 and related Phosphosites

You searched for "Q9BQI3" in kinase acc\_no using like match.

## Kinase Search Result - Record Detail

<b>Accession no</b>	Q9BQI3
<b>Short name</b>	HRI
<b>Full name</b>	Eukaryotic translation initiation factor 2-alpha kinase 1
<b>Gene</b>	EIF2AK1
<b>Species</b>	human
<b>Cellular location</b>	Cytoplasm {ECO:0000250}.
<b>Family</b>	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	MILLSELRRRIISL	S1	activity, induced; molecular association, regulation; activity, inhibited	<a href="#">Detail</a>
450210	S49	IEGMILLSELRRRI	S1	molecular association, regulation	<a href="#">Detail</a>

### 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.

## Phosphosite Search Result - Record Detail

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

### Kinases related to Phosphosite-447635

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

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

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

This search function allows you to search the PhosphoQuest database using 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

HRI

Choose search type: similar matches

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Results for HRI and kinase records.

You searched for "HRI" in kinase name using like match.

## Kinase Records

Accession no	Full name	Gene	Detail
P29323	Ephrin type-B receptor 2	EPHE2	<a href="#">Detail</a>
P29317	Ephrin type-A receptor 2	EPHA2	<a href="#">Detail</a>
P54753	Ephrin type-B receptor 3 (EPHE3)	EPHE3	<a href="#">Detail</a>
P54764	Ephrin type-A receptor 4	EPHA4	<a href="#">Detail</a>

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

## Kinase Search Result - Record Detail

<b>Accession no</b>	P29323
<b>Short name</b>	EphB2
<b>Full name</b>	Ephrin type-B receptor 2
<b>Gene</b>	EPHB2
<b>Species</b>	human
<b>Cellular location</b>	Cell membrane; Single-pass type I membrane protein. Cell projection, axon {ECO:0000250}. Cell projection, dendrite {ECO:0000250}.
<b>Family</b>	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	DPTIEDS <sup>y</sup> TKICSVD	Ras	molecular association, regulation	<a href="#">Detail</a>

### 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:-

## 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	<a href="#">P10301</a>

### Kinases related to Phosphosite-448122

Accession no	Full name	Gene	Detail
P29323	Ephrin type-B receptor 2	EPHB2	<a href="#">Detail</a>
P12931	DNA-PK/ Src	SRC	<a href="#">Detail</a>

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

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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

P01236

Choose search type: similar matches ▼

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Results for P01236 and phosphosites related to this particular substrate.

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	LHCLRRD\$HKIDNYL	Hormone_1	protein conformation	<a href="#">Detail</a>
455331	S194	ADEESRL\$AYYNLLH	Hormone_1		<a href="#">Detail</a>
455332	S163	EGMELIV\$QVHPETK	Hormone_1		<a href="#">Detail</a>
17790903	S179	NEIYPVW\$GLPSLQM	Hormone_1		<a href="#">Detail</a>

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

## Phosphosite Search Result - Record Detail

Group ID	451732
Modified residue	S207
Phosphosite	LHCLRRDsHKIDNYL
Phosphorylation domain	Hormone_1
Phosphorylation Function	protein conformation
Processes	
Protein Interactions	
Other interactions	
References	19555049
Notes	phosphorylated form of prolactin has a higher affinity for heparin
Related substrate	<a href="#">P01236</a>

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### Kinases related to Phosphosite-451732

No Items

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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



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

This search function allows you to search the PhosphoQuest database using 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

PRL

Choose search type: similar matches ▼

Search

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Results for PRL substrate records.

You searched for "PRL" in substrate name using like match.

## Substrate Records

Accession no	Full name	Molecular weight (kd)	Gene	Chromosome location	Detail
Q8WTW4	GATOR complex protein NPRL2	43.66	NPRL2	3p21.31	<a href="#">Detail</a>
Q12980	GATOR complex protein NPRL3	63.6	NPRL3	16p13.3	<a href="#">Detail</a>

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

## 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	ELESSFVSMEEKQK	NPR2		<a href="#">Detail</a>
23070073	T293	CSLSPGTIVRDLGR	NPR2		<a href="#">Detail</a>

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:-

## Phosphosite Search Result - Record Detail

Group ID	23070070
Modified residue	S120
Phosphosite	ELESSFVsMEESKQK
Phosphorylation domain	NPR2
Related substrate	<a href="#">Q8WTW4</a>

---

### Kinases related to Phosphosite-23070070

No Items

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

## 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	ELESSFVSMEEKQK	NPR2		<a href="#">Detail</a>
23070073	T293	CSLSPGTVVRDLGR	NPR2		<a href="#">Detail</a>

### '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

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

This search function allows you to search the PhosphoQuest database using 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

4877

Choose search type: similar matches ▼

Search




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Results for 4877 and a list of potential PubChem numbers.

You searched for "4877" in inhibitor acc\_no using like match.

## Inhibitor Records

PubChem no	Compound	Detail
4877	1 NA-PP1 (PP1 Analog)	<a href="#">Detail</a>
1474877	4-(Benzylamino)quinazoline deriv. 40::CHEMBL545541::N-benzyl-6,7-dimethoxyquinazolin-4-amine	<a href="#">Detail</a>
23644877	((pyridin-4-yl)ethyl)pyridine 25::N-[4-(chlorodifluoromethoxy)phenyl]-5-{2-[2-(pyridin-4-yl)ethyl]pyridin-3-yl}-1,3,4-oxadiazol-2-amine	<a href="#">Detail</a>

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


## Inhibitor Search Result - Record Detail

<b>PubChem CID</b>	4877
<b>Name</b>	1 NA-PP1 (PP1 Analog)
<b>Full name</b>	1-tert-butyl-3-naphthalen-1-ylpyrazolo[3,4-d]pyrimidin-4-amine
<b>Brutto</b>	C <sub>19</sub> H <sub>19</sub> N <sub>5</sub>
<b>molec. weight (g/mol)</b>	317.4
<b>SMILE</b>	<chem>CC(C)(C)N1C2=C(C(=N1)C3=CC=CC4=CC=CC=C43)C(=NC=N2)N</chem>
<b>InChI</b>	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)
<b>InChI key</b>	XSHQBIXMLULFEV-UHFFFAOYSA-N
<b>vendor</b>	Merck (Calbiochem)
<b>Cat. No.</b>	221243-82-9

Scroll down below widget for related Targeted Kinases

PUBCHEM > 1-(1,1-DIMETHYLETHYL... (COMPOUND) > 3D CONFORMER

CID 4877  
**1-(1,1-Dimethylethyl)-3-(1-naphthalenyl)-1H-pyrazolo[3,4-d]pyrimidin-4-amine**  
3D Conformer ?


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Interactive Chemical

### 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 results for 4877.

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

### 'Similar Matches' option



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

This search function allows you to search the PhosphoQuest database using 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 ▼

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Results for (5Z)-7-Oxozeaenol.

You searched for "(5Z)-7-Oxozeaenol" in inhibitor name using like match.

## Inhibitor Search Result - Record Detail

<b>PubChem CID</b>	53442201
<b>Name</b>	(5Z)-7-Oxozeaenol
<b>Full name</b>	9,10,18-trihydroxy-16-methoxy-4-methyl-3-oxabicyclo[12.4.0]octadeca-1(14),6,12,15,17-pentaene-2,8-dione
<b>Brutto</b>	C <sub>19</sub> H <sub>22</sub> O <sub>7</sub>
<b>molec. weight (g/mol)</b>	362.37
<b>SMILE</b>	CC1CC=CC(=O)C(C(CC=CC2=CC(=CC(=C2C(=O)O1)O)OC)O)O
<b>InChI</b>	InChI=1S/C19H22O7/c1-11-5-3-7-14(20)18(23)15(21)8-4-6-12-9-13(25-2)10-16(22)17(12)19(24)26-11/h3-4,6-7,9-11,15,18,21-23H,5,8H2,1-2H3
<b>InChI key</b>	NEQZWEXWOFPKOT-UHFFFAOYSA-N
<b>vendor</b>	Tocris
<b>Cat. No.</b>	66018-38-0

Scroll down below widget for related Kinases

PUBCHEM > NEQZWEXWOFPKOT-UHFFF... (COMPOUND) > 3D CONFORMER

CID 53442201  

# NEQZWEXWOFPKOT-UHFFFAOYSA-N

## 3D Conformer

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### Kinases related to Inhibitor-53442201

No Items

### '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.