



Accessing the Data: Query, Reporting, and Examples

www.iedb.org

Presented by: Randi Vita, MD, Lead Ontology and Quality Manager
& Sidne Fitzpatrick, PhD, Curator

Home Page Query

The IEDB has just launched its updated 3D viewers! Learn more via our help article [here](#).

Welcome

The Immune Epitope Database (IEDB) is a freely available resource funded by NIAID. It catalogs experimental data on antibody and T cell epitopes studied in humans, non-human primates, and other animal species in the context of infectious disease, allergy, autoimmunity and transplantation. The IEDB also hosts tools to assist in the prediction and analysis of epitopes.

[Learn More](#)

Upcoming Events & News

AAI Exhibitor Booth May 6-10
FOCIS Exhibitor Booth June 21-24
[Virtual User Workshop](#) Oct 26-28
* register [here](#)

[IEDB SARS-CoV-2 Epitope Analysis Videos](#)

Summary Metrics

Peptidic Epitopes	1,539,160
Non-Peptidic Epitopes	3,146
T Cell Assays	443,436
B Cell Assays	1,332,346
MHC Ligand Assays	4,631,825
Epitope Source Organisms	4,233
Restricting MHC Alleles	969
References	23,292

START YOUR SEARCH HERE

1 Epitope ?

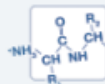
Any

Linear peptide

Exact M

Discontinuous

Non-peptidic



5 Assay ?

T Cell

B Cell

MHC Ligand

Ex: neutralization

Outcome: Positive Negative



2 Epitope Source ?

Organism

Ex: influenza, peanut

Antigen

Ex: core, capsid, myosin



6 MHC Restriction ?

Any

Class I

Class II

Non-classical

Ex: HLA-A*02:01



4 Host ?

Any

Human

Mouse

Non-human primate

Ex: dog, camel



7 Disease ?

Any

Infectious

Allergic

Autoimmune

Ex: asthma



Epitope Analysis Resource

T Cell Epitope Prediction ?

Scan an antigen sequence for amino acid patterns indicative of:

MHC I Binding

MHC II Binding

MHC I Processing (Proteasome, TAP)

MHC I Immunogenicity

B Cell Epitope Prediction ?

Predict linear B cell epitopes using:

Antigen Sequence Properties

Predict discontinuous B cell epitopes using antigen structure via:

Discotope

ElliPro

Epitope Analysis Tools ?

Analyze epitope sets of:

Population Coverage

Conservation Across Antigens

Clusters with Similar Sequences

Epitope Search Pane

Search by epitope sequence

START YOUR SEARCH HERE ?

Epitope ?

Any

Linear peptide

Exact Match

Discontinuous

Non-peptidic

Assay ?

T Cell

B Cell

MHC Ligand

Ex: neutralization

Outcome: Positive

Epitope Source ?

Organism

Antigen

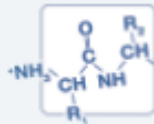
MHC Restriction ?

Any

Class I

Class II

Non-classical



START YOUR SEARCH HERE ?

Epitope ?

Any

Linear peptide

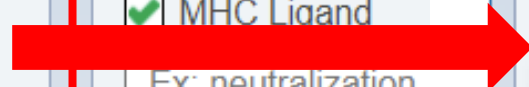
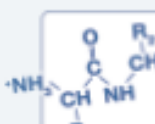
Exact Match

Exact Matches


- Substring
- Blast - 90%
- Blast - 80%
- Blast - 70%

Epitope Source ?


Organism




Antigen Search Pane: Organism

Epitope Source ? 


Organism

Ex: influenza, peanut 


Antigen


Ex: core, capsid, myosin 



Epitope Source ? 

Organism

cord 

MHC Restriction ? 

Any

Class I

Coronavirus (ID:11118)

Alphacoronavirus (ID:693996, **Coronavirus**)

Betacoronavirus (ID:694002, **Coronavirus**)

Bat **coronavirus** (ID:1508220)

Yak **coronavirus** (ID:2501420)

Human coronavirus 229E (Coronavirus 229E) (ID:11137, **Coron...**)


Human coronavirus NL63 (Coronavirus NL63) (ID:277944, **Cor...**)

Middle East respiratory syndrome-related coronavirus (MERS c...


Severe acute respiratory syndrome-related coronavirus (Human...

Avian **coronavirus** (ID:694014)


Antigen Search Pane: Antigen

Epitope Source ? 


Organism

Ex: influenza, peanut 

Antigen

Ex: core, capsid, myosin 




Antigen ? 

Organism

Ex: influenza, peanut

Antigen Name

capsid


MHC Restriction ? 

Any MHC Restriction

MHC Class I


MHC Class II

MHC Nonclassical


Ex: HLA-A*02:01 

- Nucleocapsid [Q91MK3] (Menangle pararubulavirus)
- Nucleocapsid [A0A0F6N4C5] (Bovine respirovirus 3 (Bovine pa...))
- Nucleocapsid [T1UFE7] (Human respirovirus 3 (Human parainf...))
- Nucleocapsid [Q83138] (Small ruminant morbillivirus (Pseudori...))
- Nucleocapsid [A0A0H5BN46] (Rinderpest morbillivirus (Rinder...))
- Capsid protein [Q91PS7] (Torque teno virus 8)
- Capsid protein [Q9JH33] (Torque teno virus 15)
- Capsid protein [Q9DUB7] (Torque teno douroucouli virus)
- Capsid protein [Q8QVL3] (Torque teno felis virus)
- Capsid protein [Q8QVL9] (Torque teno sus virus 1a (Torque ten...))

Host Search Pane

Host ? 

Any
 Human
 Mouse
 Non-human primate
  Find

HOST ORGANISM FINDER ? 


Current Selection(s) Reset Apply

Search By

Name:


Organism ID:

Search

Browse by Tree (Click to Select) 

- Vertebrate
 - Ave (bird)
 - Fish
 - Mammal

Assay Search Pane

Assay ? 

T Cell
 B Cell
 MHC Ligand

Ex: neutralization

Outcome: Positive Negative

ASSAY FINDER ?

Current Selection(s)

Search By

Name:

Method/Technique:

Measurement Of:

Units:

Browse by Tree (Click to Select)

- immune epitope assay
 - T cell assay
 - B cell assay
- 3D structure
- binding constant
- biological activity
- qualitative binding
- MHC ligand assay

MHC Restriction Search Pane

MHC Restriction ?

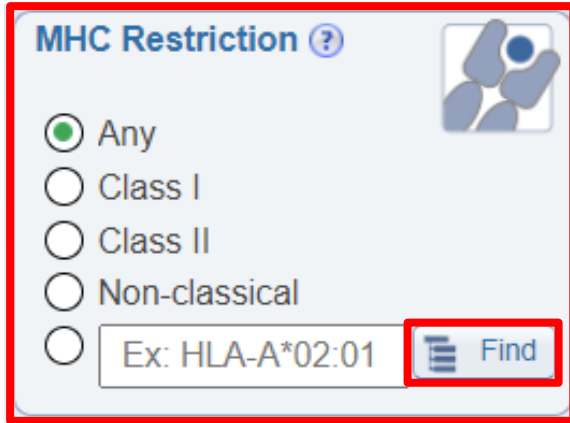
Any

Class I

Class II

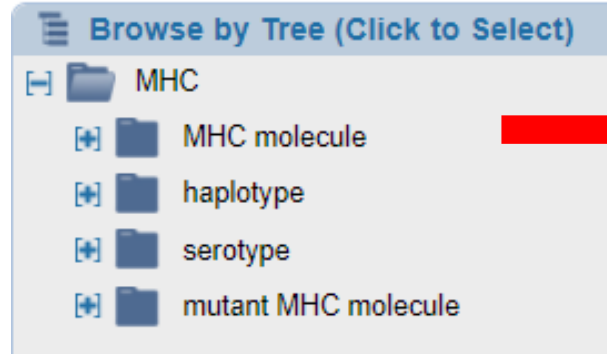
Non-classical

Ex: HLA-A*02:01

The MHC Restriction Search Pane is a light blue box with a red border. It contains a title "MHC Restriction" with a help icon, a radio button menu with options "Any", "Class I", "Class II", and "Non-classical", and a text input field with the example "Ex: HLA-A*02:01" and a "Find" button. A red arrow points from the "Find" button to the "Browse by Tree" pane below.

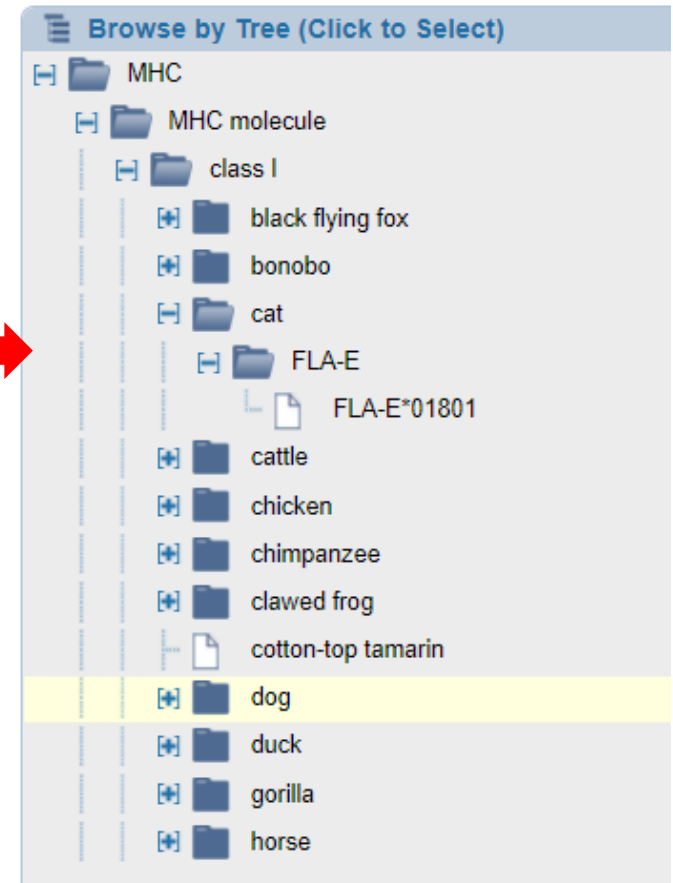
Browse by Tree (Click to Select)

- MHC
 - MHC molecule
 - haplotype
 - serotype
 - mutant MHC molecule


This pane shows a tree view with "MHC" selected. Under "MHC", there are four sub-items: "MHC molecule", "haplotype", "serotype", and "mutant MHC molecule". A red arrow points from the "MHC molecule" item to the next pane.

Browse by Tree (Click to Select)

- MHC
 - MHC molecule
 - class I
 - black flying fox
 - bonobo
 - cat
 - FLA-E
 - FLA-E*01801
 - cattle
 - chicken
 - chimpanzee
 - clawed frog
 - cotton-top tamarin
 - dog**
 - duck
 - gorilla
 - horse

This pane shows a tree view with "MHC molecule" selected. Under "MHC molecule", there is a "class I" folder. Under "class I", there are several species folders: "black flying fox", "bonobo", "cat", "FLA-E", "cattle", "chicken", "chimpanzee", "clawed frog", "cotton-top tamarin", "dog", "duck", "gorilla", and "horse". The "dog" folder is highlighted in yellow. A red arrow points from the "dog" folder to the next pane.

Disease Search Pane

Disease ? 

Any
 Infectious
 Allergic
 Autoimmune

Ex: asthma

Browse by Tree (Click to Select)

- host health status
 - disease
 - additional diseases by category
 - allergic disease
 - animal model of disease
 - autoimmune disease
 - infectious disease
 - neoplasm
 - transplant-related disease and allo-reactivity
 - healthy
 - infection without disease

Browse by Tree (Click to Select)

- host health status
 - disease
 - additional diseases by category
 - allergic disease
 - allergic contact dermatitis
 - allergic contact dermatitis of eyelid
 - drug allergy
 - extrinsic asthma
 - gastrointestinal allergy
 - latex allergy
 - metal allergy
 - respiratory allergy
 - animal model of disease
 - autoimmune disease
 - infectious disease
 - neoplasm
 - transplant-related disease and allo-reactivity

User Queries: How to see the differences between B and T cell responses for SARS-CoV2

Start typing the organism name and autocomplete will provide options for which the IEDB has data

The screenshot shows the IEDB search interface. The 'Organism' field contains the text 'sar'. A red arrow points from the text on the left to this field. Below the field is a dropdown menu with the following options:

- SARS-CoV2 (ID:2697049, **SARS2**)
- Erythrocebus patas (hussar) (ID:9538, hussar)
- SARS-CoV1 (ID:10002316, **SARS-1**)
- Legionella (ID:445, **Sarcobium**)
- SARS coronavirus Tor2 (Severe acute respiratory syndrome-rel...)
- Other **SARS** (ID:10002383)
- Abrus precatorius (Indian licorice) (ID:3816, rosary pea)
- Fusarium sp. (ID:29916)
- Sarbecovirus** (ID:2509511)
- SARS-CoV2 Mu** (ID:10002532)

At the bottom of the dropdown are 'Reset' and 'Search' buttons.

User Queries: How to see the differences between B and T cell responses for SARS-CoV2

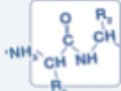
Select SARS-CoV2

This is a multi-select field
The number displays how many selections you have made


Once your query is built, click "Search"

**You can select from all search panes or from none


START YOUR SEARCH HERE ?

Epitope ? 


Any
 Linear peptide
Exact M ▾ Ex: SIINFEKL
 Discontinuous
 Non-peptidic

Assay ? 


T Cell
 B Cell
 MHC Ligand
Ex: neutralization
Outcome: Positive Negative

Epitope Source ? 


Organism
SARS-CoV2 (ID:2697) **1**
Antigen
Ex: core, capsid, myos

MHC Restriction ? 

Any
 Class I
 Class II
 Non-classical
 Ex: HLA-A*02:01

Host ? 

Any
 Human
 Mouse
 Non-human primate
 Ex: dog, camel

Disease ? 

Any
 Infectious
 Allergic
 Autoimmune
 Ex: asthma

Results Page: Pending Filters/Current Filters

Pending Filters

Reset Search

Filter Options ?

Default

Epitope ?

Any

Linear peptide

Length

Sequence

Discontinuous

Non-peptidic

3D structure assays

Amino acid modification

Epitope Source ?

Organism

SARS-CoV2 (ID:2697049, 1)

Antigen

Ex: core, capsid, myosin

Include related structure

Select multiple options

Receptor ?

Has sequence

Current Filters: Organism: SARS-CoV2 (ID:2697049, SARS2) Include Positive Assays

Epitopes (16175) **Antigens** (18) **Assays** (46781) **Receptors** (87269) **References** (443)

Go To Records Starting At 1200 GO Export Results

16175 Records Found Page 1 of 647 25 Per Page

IEDB ID	Epitope	Antigen	Organism	# References	# Assays
1309147	YLPRTFLL	Spike glycoprotein	SARS-CoV2	35	125
37473	LLLDRLNQL	Nucleoprotein	SARS-CoV2	22	37
60242	SPRWYFYLL	Nucleoprotein	SARS-CoV2	20	97
1310756	QYIKWPWYI	Spike glycoprotein	SARS-CoV2	19	82
33667	KTFPPTEPK	Nucleoprotein	SARS-CoV2	16	50
1309115	FTSDYYQLY	ORF3a protein	SARS-CoV2	16	32
1313269	NYNLYRLF	Spike glycoprotein	SARS-CoV2	15	34
69657	VLNDILSRL	Spike glycoprotein	SARS-CoV2	14	27
1311180	LLYDANYFL	ORF3a protein	SARS-CoV2	14	32
16156	FIAGLIAIV	Spike glycoprotein	SARS-CoV2	13	40
71663	VVFLHVTYV	Spike glycoprotein	SARS-CoV2	13	17
72048	VYIGDPAQL	Replicase polyprotein 1ab	SARS-CoV2	13	36
1309137	SIIAYTMSL	Spike glycoprotein	SARS-CoV2	13	29
1310623	LTDEMAIQY	Spike glycoprotein	SARS-CoV2	13	31
190494	MEVTPSGTWL	Nucleoprotein	SARS-CoV2	12	28
21347	GMSRIGMEV	Nucleoprotein	SARS-CoV2	11	16
1071580	NLLLQYGSFCTQLNR	Spike glycoprotein	SARS-CoV2	11	29
1074846	ALSKGVHFV	ORF3a protein	SARS-CoV2	11	21
1310598	LLLLDRLNQLESKMS	Nucleoprotein	SARS-CoV2	11	84
1310934	VYFLQSINF	ORF3a protein	SARS-CoV2	11	17
1311144	DTDFVNEFY	Replicase polyprotein 1ab	SARS-CoV2	11	17

Results Page: Pending Filters/Filter Options

Pending Filters

Reset Search

Filter Options ?

Default

Default

T Cell

B Cell

MHC

Any

Linear peptide

Length

Sequence

Discontinuous

Non-peptidic

3D structure assays

Amino acid modification

Epitope Source ?

Organism

SARS-CoV2 (ID:2697049, 1)

Antigen

Ex: core, capsid, myosin

Include related structure

Select multiple options

Receptor ?

Has sequence

Current Filters: Organism: SARS-CoV2 (ID:2697049, SARS2) Include Positive Assays

Epitopes (16175) Antigens (18) Assays (46781) Receptors (87269) References (443)

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69657	VLNDLSRL	Spike glycoprotein	SARS-CoV2	14	27
1311180	LLYDANYFL	ORF3a protein	SARS-CoV2	14	32
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1310934	VYFLQSINF	ORF3a protein	SARS-CoV2	11	17
1311144	DTDFVNEFY	Replicase polyprotein 1ab	SARS-CoV2	11	17

Results Page: Additional Filter Options - Default

Details ▾ Epitope

Epitope ?

Any

Linear peptide

Length to

Sequence

Discontinuous

Non-peptidic

3D structure available

Amino acid modification

Epitope Source ?

21347	GMSRIGMEV
-------	-----------

Receptor ?

Has sequence TCR BCR

Type Name

Paired chains only

Chain Region

Sequence

Assay ?

Amino acid modification

16156	FIAGLIAIV
-------	-----------

Epitope Source ?

Organism

Antigen

Include related structure

Analogs

Mimotopes

Neopeptides

Only neopeptides

Paired chains only

34851	LALLLDRL
-------	----------



Results Page: Additional Filter Options – T Cell

TCR ?

Has TCR sequence

Type Name

Paired chains only

Chain Region

Sequence

MHC Restriction ?

Any

Class I

Class II

Non-classical

Resolution

Evidence

T Cell Assay ?

Outcome: Positive Negative

Any

Cytokine production

MHC multimer

In vivo

Direct ex vivo detection

MHC Restriction ?

Any

Class I

Class II

Non-classical

Resolution

Evidence

Single allele present

T cell assay -MHC subset identification

T cell assay -Mismatched MHC molecules

MHC binding assay

MHC binding prediction

Results Page: Additional Filter Options – B Cell

Antibody/BCR ⓘ

Has BCR sequence

Type Name

Paired chains only

Chain Region

Sequence

Note: A red box highlights the Chain dropdown menu, which is currently open to show options: Any Type, heavy, and light.

B Cell Assay ⓘ

Outcome: Positive Negative

Any

Antibody binding


Neutralization


In vivo


Antibody isotype


Note: A red box highlights the radio button options and the Antibody isotype dropdown menu.


Results Page: Additional Filter Options – MHC


MHC Assay 


Outcome: Positive Negative 

Any
 Binding
 Ligand elution/Mass spectrometry
 Ex: crystallography  Find

MHC Restriction 

Any
 Class I
 Class II
 Non-classical
 Ex: HLA-A*02:01  Find

Resolution 

Evidence 

Results Page: Epitope Tab

Pending Filters

Reset Search

Filter Options ?

Default

Epitope ?

Any

Linear peptide

Length

Sequence

Discontinuous

Non-peptidic

3D structure assays

Amino acid modification

Epitope Source ?

Organism

SARS-CoV2 (ID:2697049, 1)

Antigen

Ex: core, capsid, myosin

Include related structure

Select multiple options

Receptor ?

Has sequence

Current Filters: Organism: SARS-CoV2 (ID:2697049, SARS2) Include Positive Assays

Epitopes (16175)	Antigens (18)	Assays (46781)	Receptors (87269)	References (443)
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Go To Records Starting At 1200 GO Export Results

16175 Records Found Page 1 of 647 25 Per Page

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1309115	FTSDYYQLY	ORF3a protein	SARS-CoV2	16	32
1313269	NYNLYRLF	Spike glycoprotein	SARS-CoV2	15	34
69657	VLNDILSRL	Spike glycoprotein	SARS-CoV2	14	27
1311180	LLYDANYFL	ORF3a protein	SARS-CoV2	14	32
16156	FIAGLIAIV	Spike glycoprotein	SARS-CoV2	13	40
71663	VVFLHVTYV	Spike glycoprotein	SARS-CoV2	13	17
72048	VYIGDPAQL	Replicase polyprotein 1ab	SARS-CoV2	13	36
1309137	SIIAYTMSL	Spike glycoprotein	SARS-CoV2	13	29
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1310934	VYFLQSINF	ORF3a protein	SARS-CoV2	11	17
1311144	DTDFVNEFY	Replicase polyprotein 1ab	SARS-CoV2	11	17

Results Page: Epitope Table Headers

Current Filters: Organism: SARS-CoV2 (ID:2697049, SARS2) Include Positive Assays

Epitopes (16175) Antigens (18) Assays (46781) Receptors (87269) References (443)

Go To Records Starting At Export Results

16175 Records Found Page of 647 Per Page

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Results Page: Epitope Details

EPITOPE SUMMARY

YLQPRTFLL is a linear peptidic epitope (epitope ID 1309147) studied as part of Spike glycoprotein from SARS-CoV2. This epitope has been studied for immune reactivity in 37 publication(s), tested in 127 T cell assays, 11 MHC ligand assays and has 3D structure(s) 7N1F, 7PBE, 7N1A, 7N6E, 7N6D and 7P3D.

COMPILED DATA

MHC Ligand Assay(s) 11

MHC molecule	Positive / All
HLA-A*02:01	11/11

T Cell Assay(s) 127

Assay Type	Positive / All
qualitative binding	51/59
IFNg release	19/22
dissociation constant KD	9/10
activation	9/9
CCL4/MIP-1b release	4/4
granzyme B release	4/4
TNFa release	4/4
3D structure	3/3
degranulation	3/3
perforin release	3/3
cytotoxicity	2/3
granzyme A release	2/2
proliferation	1/1

Results Pages: All Have Inline Filters

Current Filters: ✖ Organism: SARS-CoV2 (ID:2697049, SARS2) ✖ Include Positive Assays

Epitopes (16175)
Antigens (18)
Assays (46781)
Receptors (87269)
References (443)

Go To Records Starting At [Export Results](#)

16175 Records Found Page 1 of 647 Per Page

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1309137	SIIAYTMSL	Spike glycoprotein	SARS-CoV2	13	29
1310623	LTDEMIQY	Spike glycoprotein	SARS-CoV2	13	31

Results Pages: All Have Exports Options

Current Filters: ✖ Organism: SARS-CoV2 (ID:2697049, SARS2) ✖ Include Positive Assays

[Epitopes \(16175\)](#)
[Antigens \(18\)](#)
[Assays \(46781\)](#)
[Receptors \(87269\)](#)
[References \(443\)](#)

Go To Records Starting At

16175 Records Found Page 1 of 647 25 Per Page [Export Results](#)

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60242	SPRWYFYLYL	Nucleoprotein	SARS-CoV2	20	97
1310756	QYIKWPWYI	Spike glycoprotein	SARS-CoV2	19	82
33667	KTFPPTEPK	Nucleoprotein	SARS-CoV2	16	50
1309115	FTSDYYQLY	ORF3a protein	SARS-CoV2	16	32
1313269	NYNLYRLF	Spike glycoprotein	SARS-CoV2	15	34
69657	VLNDILSRL	Spike glycoprotein	SARS-CoV2	14	27
1311180	LLYDANYFL	ORF3a protein	SARS-CoV2	14	32
16156	FIAGLIAIV	Spike glycoprotein	SARS-CoV2	13	40
71663	VVFLHVTYV	Spike glycoprotein	SARS-CoV2	13	17
72048	VYIGDPAQL	Replicase polyprotein 1ab	SARS-CoV2	13	36
1309137	SIAYTMSL	Spike glycoprotein	SARS-CoV2	13	29
1310623	LTDEMIQY	Spike glycoprotein	SARS-CoV2	13	31

Results Pages: All Have Export Options

Current Filters: ✖ Organism: SARS-CoV2 (ID:2697049, SARS2) ✖ Include Positive Assays

Epitopes (16175) Antigens (18) Assays (46781) Receptors (87269) References (443)

Go To Records Starting At Export Results

16175 Records Found Page of 647 Per Page

IEDB ID	Epitope	Antigen	Assays	Receptors	References
1309147	YLQPRTFLL	Spike glycoprotein			
37473	LLLDRLNQL	Nucleoprotein			
60242	SPRWYFYLL	Nucleoprotein	SARS-CoV2		97
1310756	QYIKWPWYI	Spike glycoprotein	SARS-CoV2		82
33667	KTFPPTEPK	Nucleoprotein	SARS-CoV2		50
1309115	FTSDYYQLY	ORF3a protein	SARS-CoV2		32
1313269	NYNYLYRLF	Spike glycoprotein	SARS-CoV2		34
69657	VLNDILSRL	Spike glycoprotein	SARS-CoV2		27
1311180	LLYDANYFL	ORF3a protein	SARS-CoV2		32
16156	FIAGLIAIV	Spike glycoprotein	SARS-CoV2		40
71663	VVFLHVTYV	Spike glycoprotein	SARS-CoV2		17
72048	VYIGDPAQL	Replicase polyprotein 1ab	SARS-CoV2		36
1309137	SIIAYTMSL	Spike glycoprotein	SARS-CoV2		29
1310623	LTDEMI AQY	Spike glycoprotein	SARS-CoV2		31
190494	MEVTPSGTWL	Nucleoprotein	SARS-CoV2		28
21347	GMSRIGMEV	Nucleoprotein	SARS-CoV2		16

Export to CSV file.

Export to CSV file with IRIs.

Results Page: Antigen Tab – Table Headers

Epitopes
(16175)

Antigens
(18)

Assays
(46781)

Receptors
(87269)

References
(443)

Go To Records Starting At [Go](#)

[Export Results](#)

18 Records Found

Page of 1

Per Page

Antigen	Organism	# Epitopes	# Assays	# References
Spike glycoprotein	SARS-CoV2	5265	20802	407
Nucleoprotein	SARS-CoV2	1165	3756	105
Membrane protein	SARS-CoV2	440	1800	64
Replicase polyprotein 1ab	SARS-CoV2	8308	17623	56
ORF3a protein	SARS-CoV2	352	852	38
Envelope small membrane protein	SARS-CoV2	94	351	32
ORF8 protein	SARS-CoV2	175	548	23
ORF7a protein	SARS-CoV2	140	278	23
Two components:Spike glycoprotein & Spike glycoprotein	SARS-CoV2	25	225	16
ORF6 protein	SARS-CoV2	60	135	15
ORF10 protein	SARS-CoV2	36	93	11
ORF9b protein	SARS-CoV2	57	165	5
ORF7b protein	SARS-CoV2	19	40	5
Other SARS-CoV2 protein	SARS-CoV2	7	9	3
Replicase polyprotein 1a	SARS-CoV2	10	40	3
Putative ORF9c protein	SARS-CoV2	29	55	2

Results Page: Assays Tab – Subtabs

Epitopes (16175)		Antigens (18)		Assays (46781)		Receptors (87269)		References (443)	
T Cell Assays (8425)		B Cell Assays (24283)		MHC Ligand Assays (14093)					
Go To Records Starting At <input type="text" value="A,b"/> <input type="button" value="GO"/> Export Results 									
8425 Records Found Page <input type="text" value="1"/> of 337 25 <input type="text"/> Per Page									
IEDB ID	Reference	Epitope	Host	Immunization	Assay Antigen	Antigen Epitope Relation	MHC Restriction	Assay Description	
13836508	Jun Siong Low; Science 2021	LSRLDKVEAEVQ IDR Spike glycoprotein (981-995) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by restimulation in vitro	S protein S protein SARS coronavirus Urbani (SARS-CoV (Urbani strain))	Taxonomic Sibling	HLA class II	3H-thymidine proliferation Positive	
13836509	Jun Siong Low; Science 2021	LSRLDKVEAEVQ IDR Spike glycoprotein (981-995) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by restimulation in vitro	spike protein [Human coronavirus OC43] spike protein [Human coronavirus OC43] Human coronavirus OC43 (Human coronavirus (strain OC43))	Taxonomic Sibling	HLA class II	3H-thymidine proliferation Positive	
13835984	Jun Siong Low; Science 2021	SFIEDLLFNKVTL AD Spike glycoprotein (816-830) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by	Spike glycoprotein Spike glycoprotein SARS-CoV2	Source Antigen	HLA class II	3H-thymidine proliferation Positive	


Results Page: Assays Tab – Table Headers

Epitopes (16175)		Antigens (18)		Assays (46781)		Receptors (87269)		References (443)		
T Cell Assays (8425)			B Cell Assays (24263)		MHC Ligand Assays (14093)					
Go To Records Starting At <input type="text" value="A,b"/> <input type="button" value="GO"/>						Export Results				
8425 Records Found				Page <input type="text" value="1"/> of 337			25 <input type="text"/> Per Page			
IEDB ID	Reference	Epitope	Host	Immunization	Assay Antigen	Antigen Epitope Relation	MHC Restriction	Assay Description		
13836508	Jun Siong Low; Science 2021	LSRLDKVEAEVQ IDR Spike glycoprotein (981-995) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by restimulation in vitro	S protein S protein SARS coronavirus Urbani (SARS-CoV (Urbani strain))	Taxonomic Sibling	HLA class II	3H-thymidine proliferation Positive		
13836509	Jun Siong Low; Science 2021	LSRLDKVEAEVQ IDR Spike glycoprotein (981-995) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by restimulation in vitro	spike protein [Human coronavirus OC43] spike protein [Human coronavirus OC43] Human coronavirus OC43 (Human coronavirus (strain OC43))	Taxonomic Sibling	HLA class II	3H-thymidine proliferation Positive		
13835984	Jun Siong Low; Science 2021	SFIEDLLFNKVTL AD Spike glycoprotein (816-830) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by	Spike glycoprotein Spike glycoprotein SARS-CoV2	Source Antigen	HLA class II	3H-thymidine proliferation Positive		

Results Page: Assays Tab – Assay Details

Epitopes (16175)		Antigens (18)		Assays (46781)		Receptors (87269)		References (443)	
T Cell Assays (8425)		B Cell Assays (24263)		MHC Ligand Assays (14093)					
Go To Records Starting At <input type="text" value="A,b"/> <input type="button" value="GO"/>						Export Results			
8425 Records Found						Page <input type="text" value="1"/> of 337		25 <input type="text"/> Per Page	
IEDB ID	Reference	Epitope	Host	Immunization	Assay Antigen	Antigen Epitope Relation	MHC Restriction	Assay Description	
13836508	Jun Siong Low; Science 2021	LSRLDKVEAEVQ IDR Spike glycoprotein (981-995) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by restimulation in vitro	S protein S protein SARS coronavirus Urbani (SARS-CoV (Urbani strain))	Taxonomic Sibling	HLA class II	3H-thymidine proliferation Positive	
13836509	Jun Siong Low; Science 2021	LSRLDKVEAEVQ IDR Spike glycoprotein (981-995) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by restimulation in vitro	spike protein [Human coronavirus OC43] spike protein [Human coronavirus OC43] Human coronavirus OC43 (Human coronavirus (strain OC43))	Taxonomic Sibling	HLA class II	3H-thymidine proliferation Positive	
13835984	Jun Siong Low; Science 2021	SFIEDLLFNKVTL AD Spike glycoprotein (816-830) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by	Spike glycoprotein Spike glycoprotein SARS-CoV2	Source Antigen	HLA class II	3H-thymidine proliferation Positive	

Results Page: Assays Tab – Assay Details Reference

Reference		
Reference Type	Literature	IEDB_Reference:1038797
Title	Clonal analysis of immunodominance and cross-reactivity of the CD4 T cell response to SARS-CoV-2.	
Authors	Jun Siong Low; Daniela Vaqueirinho; Federico Mele; Mathilde Foglierini; Josipa Jerak; Michela Perotti; David Jarrossay; Sandra Jovic; Laurent Perez; Rosalia Cacciatore; Tatiana Terrot; Alessandra Franzetti Pellanda; Maira Biggiogero; Christian Garzoni; Paolo Ferrari; Alessandro Ceschi; Antonio Lanzavecchia; Federica Sallusto; Antonino Cassotta	
Affiliations	Institute for Research in Biomedicine, Università della Svizzera italiana, 6500 Bellinzona, Switzerland; Laboratory of Immunogenetics, Department of Transfusion Medicine and Immunology-Hematology, Fondazione I.R.C.C.S. Policlinico S. Matteo, 27100 Pavia, Italy; Clinical Trial Unit, Ente Ospedaliero Cantonale, 6500 Bellinzona, Switzerland; Clinic of Internal Medicine and Infectious Diseases, Clinica Luganese Moncucco, 6900 Lugano, Switzerland; Faculty of Biomedical Sciences, Università della Svizzera italiana, 6900 Lugano, Switzerland; Department of Internal Medicine, Ente Ospedaliero Cantonale, 6500 Bellinzona, Switzerland; Prince of Wales Hospital Clinical School, University of New South Wales, Sydney, New South Wales 2052, Australia; Division of Clinical Pharmacology and Toxicology, Institute of Pharmacological Sciences of Southern Switzerland, Ente Ospedaliero Cantonale, 6900 Lugano, Switzerland; Department of Clinical Pharmacology and Toxicology, University Hospital Zurich, 8091 Zurich, Switzerland; National Institute of Molecular Genetics, 20122 Milano, Italy; Institute for Research in Biomedicine, Università della Svizzera italiana, 6500 Bellinzona, Switzerland. federica.sall...	
Journal	Science	PMID:34006597 
Year	2021	
Abstract	The identification of CD4 ⁺ T cell epitopes is instrumental for the design of subunit vaccines for broad protection against coronaviruses. Here, we demonstrate in COVID-19-recovered individuals a robust CD4 ⁺ T cell response to naturally processed severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) spike (S) protein and nucleoprotein (N), including effector, helper, and memory T cells. By characterizing 2943 S-reactive T cell clones from 34 individuals, we found that the receptor-binding domain (RBD) is highly immunogenic and that 33% of RBD-reactive clones and 94% of individuals recognized a conserved immunodominant S346-S365 region comprising nested human leukocyte antigen DR (HLA-DR)- and HLA-DP-restricted epitopes. Using pre- and post-COVID-19 samples and S proteins from endemic coronaviruses, we identified cross-reactive T cells targeting multiple S protein sites. The immunodominant and cross-reactive epitopes identified can inform vaccination strategies to counteract emerging SARS-CoV	

Results Page: Assays Tab – Assay Details

Epitope

Epitope		
Epitope ID	1310620	IEDB_epitope:1310620
Chemical Type	Linear peptide	
Linear Sequence	LSRLDKVEAEVQIDR	
Source Molecule Name	Spike glycoprotein	UniProt:P0DTC2.1 🔗
Source Organism	SARS-CoV2	NCBITaxon:2697049 🔗
Starting Position	981	
Ending Position	995	

Epitope Reference Details		
Epitope Structure Defines	Exact Epitope	
Epitope Name	SARS CoV2 S 981-995	
Location of Data in Reference	Supplementary Table S5	

Results Page: Assays Tab – Assay Details

in vivo Immunization

Immunization		
Host Organism	Homo sapiens (human)	NCBITaxon:9606

1st In Vivo Process		
In Vivo Process Type	Occurrence of infectious disease	OBI:1110008
Disease State	COVID-19	DOID:0080600
Disease Stage	Post;	

1st Immunogen		
Epitope Relation	Source Organism	
Object Type	Organism	
Organism	SARS-CoV2	NCBITaxon:2697049

Results Page: Assays Tab – Assay Details in vitro Immunization

In Vitro Administration		
In Vitro Process Type	Restimulation in vitro	
Responder Cell Type	PBMC	CL:2000001 🔗
Stimulator Cell Type	PBMC	CL:2000001 🔗

In Vitro Immunogen		
In Vitro Process Type	Source Antigen	
Chemical Type	Protein	
Molecule Name	Spike glycoprotein	UniProt:P0DTC2.1 🔗
Organism	SARS-CoV2	NCBITaxon:2697049 🔗

Immunization Comments		
Immunization Comments	Cells from COVID-19 individuals were stimulated with S protein. CSFE cells were expanded and restimulated with S protein from human beta (SARS-CoV, HKU1, and OC43) or alpha (NL63 and 229E) coronaviruses and proliferating T cells were cloned by limiting dilution.	

Results Page: Assays Tab – Assay Details

T Cell Assay		
Qualitative Measurement	Positive	
Method/Technique	3H-thymidine	OBI:1110180
Measurement of	proliferation	

Effector Cells		
Effector Cell Tissue Type	Blood	UBERON:0000178
Effector Cell Type	T cell CD4+	CL:0000624
Effector Cell Culture Conditions	Cell Line / Clone	

Assayed TCR Molecule		
Assayed TCR Molecule Name	P34-NL63-A2	

Antigen Presenting Cells		
Cell Tissue Type	Blood	UBERON:0000178
Cell Type	PBMC	CL:2000001
Cell Culture Conditions	Direct Ex Vivo	

Results Page: Assays Tab – Assay Details

MHC Allele		
MHC Allele Name	HLA class II	MRO:0001455
MHC Evidence Code	T cell assay -T cell subset identification	

Antigen		
Epitope Relation	Taxonomic Sibling	
Chemical Type	Protein	
Molecule Name	S protein	GenPept:AAP13441.1
Organism	SARS coronavirus Urbani (SARS-CoV (Urbani strain))	NCBITaxon:228330

Assay Reference Details		
Assay Comments by IEDB Curator	Epitope-specific clones reacted with the antigen.	
Location of Assay Data in Reference	Table S5	

Results Page: Receptors Tab – Subtabs & Groups

Epitopes (16175)		Antigens (18)		Assays (46781)		Receptors (87269)		References (443)	
T Cell Receptors (87172)		B Cell Receptors (97)							
Go To Records Starting At <input type="text" value="1200"/> <input type="button" value="GO"/>						Export Results			
87172 Records Found						Page <input type="text" value="1"/> of 3487		Per Page <input type="text" value="25"/>	
Group ID	Species	Type	Chain 1 CDR3	Chain 2 CDR3					
8670	Homo sapiens (human)	αβ	not available	ASSIRSSYEQY					
8675	Homo sapiens (human)	αβ	not available	ASSSVNEQF					
8678	Homo sapiens (human)	αβ	not available	ASSIGVYGYT					
8681	Homo sapiens (human)	αβ	not available	ASSIRSAYEQY					
8684	Homo sapiens (human)	αβ	not available	ASSRSSYEQY					
8685	Homo sapiens (human)	αβ	not available	ASSTRSAYEQY					
8686	Homo sapiens (human)	αβ	not available	ASSVRSSYEQY					
8687	Homo sapiens (human)	αβ	not available	ASSIGSYGYT					
8786	Homo sapiens (human)	αβ	not available	ASSSDSSYEQY					
9083	Homo sapiens (human)	αβ	not available	SVGNEQF					
9095	Homo sapiens (human)	αβ	not available	SVGDGNTGELF					
9314	Homo sapiens (human)	αβ	not available	ASSLAGGYEQY					
9337	Homo sapiens (human)	αβ	not available	SVERDTEAF					
9447	Homo sapiens (human)	αβ	not available	ASSLGGTEAF					
9563	Homo sapiens (human)	αβ	not available	ATSRDPGSYEQY					
9702	Homo sapiens (human)	αβ	not available	ATSAGNTGELF					
9713	Homo sapiens (human)	αβ	not available	ATSRGQGYEQY					
9778	Homo sapiens (human)	αβ	not available	ASSPYSNQPQH					
9813	Homo sapiens (human)	αβ	not available	ASSSTGTEAF					

Results Page: Receptors Tab – Receptor Group

T cell receptor (receptor group ID 8670)

Beta TCR with beta chain CDR3 of ASSIRSSYEQY was reported in Homo sapiens (human).

Gene usage		beta CDR sequences		Epitopes (# assays)
V: D: J:	CDR1: CDR2: CDR3:	V:TRBV19 D: J:TRBJ2-7	CDR1: CDR2: CDR3:ASSIRSSYEQY	GILGFVFTL (1), LLWNGPMAV (1), FLPFFSNVTWFHAI (2), VQPTESIVRFPNITNLCPF (1), YYRARAGEAANF (1)
V Domain:		V Domain:		
V: D: J:	CDR1: CDR2: CDR3:	V:TRBV19 D: J:TRBJ2-7*01	CDR1: CDR2: CDR3:ASSIRSSYEQY	GILGFVFTL (2)
V Domain:		V Domain:		
V: D: J:	CDR1: CDR2: CDR3:	V:TRBV30*01 D: J:TRBJ2-7*01	CDR1: CDR2: CDR3:ASSIRSSYEQY	GILGFVFTL (2)
V Domain:		V Domain:		
V: D: J:	CDR1: CDR2: CDR3:	V:TRBV7-2*01 D: J:TRBJ2-7*01	CDR1: CDR2: CDR3:ASSIRSSYEQY	GILGFVFTL (2)
V Domain:		V Domain:		
V: D: J:	CDR1: CDR2: CDR3:	V:TRBV25-1*01 D: J:TRBJ2-7*01	CDR1: CDR2: CDR3:ASSIRSSYEQY	GILGFVFTL (2)
V Domain:		V Domain:		

Epitope summary

This TCR was studied for the following epitopes GILGFVFTL studied as part of Matrix protein 1 from Influenza A virus (epitope ID 20354, 2 publications, 3 assays), LLWNGPMAV studied as part of Genome polyprotein from Yellow fever virus (Flavivirus febricis) (epitope ID 121572, 1 publication, 1 assay), FLPFFSNVTWFHAI studied as part of Spike glycoprotein from SARS-CoV2 (epitope ID 1074888, 1 publication, 2 assays), VQPTESIVRFPNITNLCPF studied as part of Spike glycoprotein from SARS-CoV2 (epitope ID 1075108, 1 publication, 1 assay) and YYRARAGEAANF studied as part of Replicase polyprotein 1ab from Other SARS (epitope ID 1075129, 1 publication, 1 assay).

Results Page: References Tab – Table Headers

Epitopes (16175)		Antigens (18)		Assays (46781)		Receptors (87269)		References (443)	
Go To Records Starting At <input type="text" value="1982"/> <input type="button" value="GO"/>								Export Results	
443 Records Found				Page <input type="text" value="1"/> of 18		25		Per Page	
IEDB ID	PMID	Author	Title	Journal	Date				
1040553	35404959	Alexandra C Willcox; Kevin Sung; Meghan E Garrett; Jared G Galloway; Jesse H Erasmus; Jennifer K Logue; David W Hawman; Helen Y Chu; Kim J Hasenkrug; Deborah H Fuller; Frederick A Matsen Iv; Julie Overbaugh	Detailed analysis of antibody responses to SARS-CoV-2 vaccination and infection in macaques.	PLoS Pathog	2022				
1040001	35013235	Daichao Wu; Alexander Kolesnikov; Rui Yin; Johnathan D Guest; Ragul Gowthaman; Anton Shmelev; Yana Serdyuk; Dmitry V Dianov; Grigory A Efimov; Brian G Pierce; Roy A Mariuzza	Structural assessment of HLA-A2-restricted SARS-CoV-2 spike epitopes recognized by public and private T-cell receptors.	Nat Commun	2022				
1040227	35186375	Jie Zhang; Dan Lu; Min Li; Maoshun Liu; Sijia Yao; Jianbo Zhan; William J Liu; George F Gao	A COVID-19 T-Cell Response Detection Method Based on a Newly Identified Human CD8 ⁺ T Cell Epitope from SARS-CoV-2 - Hubei Province, China, 2021.	China CDC Wkly	2022				
1040292	35235832	Quirin Hammer; Josefine Dunst; Wanda Christ; Francesca Picarazzi; Mareike Wendorff; Pouria Momayyezi; Oisín Huhn; Herman K Netskar; Kimia T Maleki; Marina García; Takuya Sekine; Ebba Sohlberg; Valerio Azzimato; Myriam Aouadi; Karolinska COVID-19 Study Group; Severe COVID-19 GWAS Group; Frauke Degenhardt; Andre Franke; Francesco Spallotta; Mattia Mori; Jakob Michaëlsson; Niklas K Björkström; Timo Rückert; Chiara Romagnani; Amir Horowitz; Jonas Klingström; Hans-Gustaf Ljunggren; Karl-Johan Malmberg	SARS-CoV-2 Nsp13 encodes for an HLA-E-stabilizing peptide that abrogates inhibition of NKG2A-expressing NK cells.	Cell Rep	2022				
1040686	35486722	Franz-Josef Obermair; Florian Renoux; Sebastian Heer; Chloe H Lee; Nastassja Cereghetti; Marisa Loi; Giulia Maestri; Yannick Haldner; Robin Wuigk; Ohad	High-resolution profiling of MHC II peptide presentation capacity reveals SARS-CoV-2 CD4 T cell targets and mechanisms of immune escape.	Sci Adv	2022				

User Queries: How to see the differences between B and T cell responses for SARS-CoV2

Results Page: Assays Tab – Subtabs

Epitopes (16175)		Antigens (18)		Assays (46781)		Receptors (87269)		References (443)	
T Cell Assays (8425)		B Cell Assays (24263)		MHC Ligand Assays (14093)					
Go To Records Starting At <input type="text" value="A,b"/> <input type="button" value="GO"/>									
8425 Records Found Export Results 									
Page <input type="text" value="1"/> of 337 25 Per Page									
IEDB ID	Reference	Epitope	Host	Immunization	Assay Antigen	Antigen Epitope Relation	MHC Restriction	Assay Description	
13836508	Jun Siong Low; Science 2021	LSRLDKVEAEVQ IDR Spike glycoprotein (981-995) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by restimulation in vitro	S protein S protein SARS coronavirus Urbani (SARS-CoV (Urbani strain))	Taxonomic Sibling	HLA class II	3H-thymidine proliferation Positive	
13836509	Jun Siong Low; Science 2021	LSRLDKVEAEVQ IDR Spike glycoprotein (981-995) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by restimulation in vitro	spike protein [Human coronavirus OC43] spike protein [Human coronavirus OC43] Human coronavirus OC43 (Human coronavirus (strain OC43))	Taxonomic Sibling	HLA class II	3H-thymidine proliferation Positive	
13835984	Jun Siong Low; Science 2021	SFIEDLLFNKVTL AD Spike glycoprotein (816-830) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by	Spike glycoprotein Spike glycoprotein SARS-CoV2	Source Antigen	HLA class II	3H-thymidine proliferation Positive	

Results Page: Additional Filters - Differences Between B and T Cell Responses

Select multiple options

Receptor ?

Has sequence

Type Any Type

Paired chains only

Chain Any Type

Sequence Exact Matches

Assay ?

Outcome: Positive Negative

T Cell B Cell MHC Ligand

Ex: IL-2 release Find

Ex: ELISA Find

Ex: purified MHC binding Find

MHC Restriction ?

Any

Class I

Class II

Non-classical

Ex: HLA-A*02:01 Find

Resolution

Evidence

Host ?

13836298	Jun Siong Low; Science 2021	SFIEDLLFNKVTLAD Spike glycoprotein (816-830) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by restimulation in vitro	spike protein [Human coronavirus OC43] spike protein [Human coronavirus OC43] Human coronavirus OC43 (Human coronavirus (strain OC43))	Taxonomic Sibli
13836456	Jun Siong Low; Science 2021	SFIEDLLFNKVTLAD Spike glycoprotein (816-830) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by restimulation in vitro	spike protein [Human coronavirus NL63] spike protein [Human coronavirus NL63] Human coronavirus NL63 (Coronavirus NL63)	Taxonomic Sibli
		SFIEDLLFNKVTLAD spike glycoprotein (816-830) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by restimulation in vitro	S [Human coronavirus 229E] S [Human coronavirus 229E] Human coronavirus 229E (Coronavirus 229E)	Taxonomic Sibli
		RDISTEIYQAGSTPC NGVEG Spike glycoprotein (466-485) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by restimulation in vitro	RDISTEIYQAGSTPC Spike glycoprotein (466-485) SARS-CoV2	Epitope
13836464	Jun Siong Low; Science 2021	LSRLDKVEAEVQIDR LITGR Spike glycoprotein (981-1000) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by restimulation in vitro	Spike glycoprotein Spike glycoprotein SARS-CoV2	Source Antigen
13836466	Jun Siong Low; Science 2021	LSRLDKVEAEVQIDR LITGR Spike glycoprotein (981-1000) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by restimulation in vitro	spike protein [Human coronavirus OC43] spike protein [Human coronavirus OC43] Human coronavirus OC43 (Human coronavirus (strain OC43))	Taxonomic Sibli
13836467	Jun Siong Low;		Homo sapiens	Infectious disease via	Spoke alvcooprotein	Taxonomic Sibli

Results Page: Additional Filters - Differences Between B and T Cell Responses

T cell assays only = T cell epitopes (3,118 epitopes)

Current Filters: ✗ Organism: SARS-CoV2 (ID:2697049, SARS2) ✗ Include Positive Assays ✗ No B cell assays ✗ No MHC assays

Epitopes (3118)
Antigens (15)
Assays (8425)
Receptors (87172)
References (125)

T Cell Assays (8425)
B Cell Assays (0)
MHC Ligand Assays (0)

Go To Records Starting At [Export Results](#)

8425 Records Found Page 1 of 337 Per Page

IEDB ID	Reference	Epitope	Host	Immunization	Assay Antigen	Antigen Epitope Relation	MHC Restriction	Assay Description
13836508	Jun Siong Low; Science 2021	LSRLDKVEAEVQI DR Spike glycoprotein (981-995) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by restimulation in vitro	S protein S protein SARS coronavirus Urbani (SARS-CoV (Urbani strain))	Taxonomic Sibling	HLA class II	3H-thymidine proliferation Positive
13836509	Jun Siong Low; Science 2021	LSRLDKVEAEVQI DR Spike glycoprotein (981-995) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism) followed by restimulation in vitro	spike protein [Human coronavirus OC43] spike protein [Human coronavirus OC43] Human coronavirus OC43 (Human coronavirus (strain OC43))	Taxonomic Sibling	HLA class II	3H-thymidine proliferation Positive

Results Page: Additional Filters - Differences Between B and T Cell Responses

B cell assays only = B cell epitopes (9,207 epitopes)

Current Filters: ✗ Organism: SARS-CoV2 (ID:2697049, SARS2) ✗ Include Positive Assays ✗ No T cell assays ✗ No MHC assays

Epitopes (9207)
Antigens (17)
Assays (24263)
Receptors (97)
References (319)

T Cell Assays (0)
B Cell Assays (24263)
MHC Ligand Assays (0)

Go To Records Starting At Export Results

24263 Records Found Page 1 of 971 25 Per Page

IEDB ID	Reference	Epitope	Host	Immunization	Assay Antigen	Antigen Epitope Relation	Assay Description
7690571	Chek Meng Poh; Nat Commun 2020	TESNKKFLPFQQFG RDIA surface glycoprotein [Severe acute respiratory syndrome coronavirus 2] (553-570) SARS-CoV2	Homo sapiens (human)	Infectious disease via exposure to SARS-CoV2 (Source Organism)	TESNKKFLPFQQFG RDIA surface glycoprotein [Severe acute respiratory syndrome coronavirus 2] (553-570) SARS-CoV2	Epitope	antigen inhibition qualitative binding Positive
16748290	Kanokpom Polyiam; Sci Rep 2021	ELLHAPATVCGPKK S TNLVK Spike glycoprotein (516-535) SARS-CoV2	Macaca fascicularis (crab eating macaque)	Prophylactic vaccination with RVQPTESIVRFPNIT NLCPFGEVFNATRF A SVYAWNKRKISNCV A DYSVL... (Fragment of Source Antigen)	ELLHAPATVCGPKK S TNLVK Spike glycoprotein (516-535) SARS-CoV2	Epitope	antigen inhibition qualitative binding Positive
16748287	Kanokpom Polyiam; Sci Rep 2021	GDEVQRQIAPGQTGK IADYNYK Spike glycoprotein	Macaca fascicularis (crab eating macaque)	Prophylactic vaccination with RVQPTESIVRFPNIT NLCPFGEVFNATRF	GDEVQRQIAPGQTGK IADYNYK Spike glycoprotein (404-424)	Epitope	antigen inhibition qualitative binding Positive

User Queries: How to see the differences between B and T cell responses

****Immunome Browser****



Epitopes (16175) **Antigens (18)** Assays (46781) Receptors (87269) References (443)

Go To Records Starting At Export Results

18 Records Found Page of 1 Per Page

Antigen	Organism	# Epitopes	# Assays	# References
Spike glycoprotein				
Nucleoprotein				
Membrane protein				
Replicase polyprotein 1ab				
ORF3a protein				
Envelope small membrane protein				
ORF8 protein				
ORF7a protein				
Two components:Spike glycoprotein & Spike glycoprotein				
ORF6 protein				
ORF10 protein				
ORF9b protein				
ORF7b protein	SARS-CoV2	19	40	5

Click icon to view Immunome Browser

Influenza A Hemagglutinin Host: Homo sapiens Assay: B cell assays

Response Frequency

The Immunome Browser maps epitopes retrieved from a query onto their source protein to visualize how often different regions in a protein have been tested and how often they were positive.

[Learn More](#)

User Queries: How to see the differences between B and T cell responses

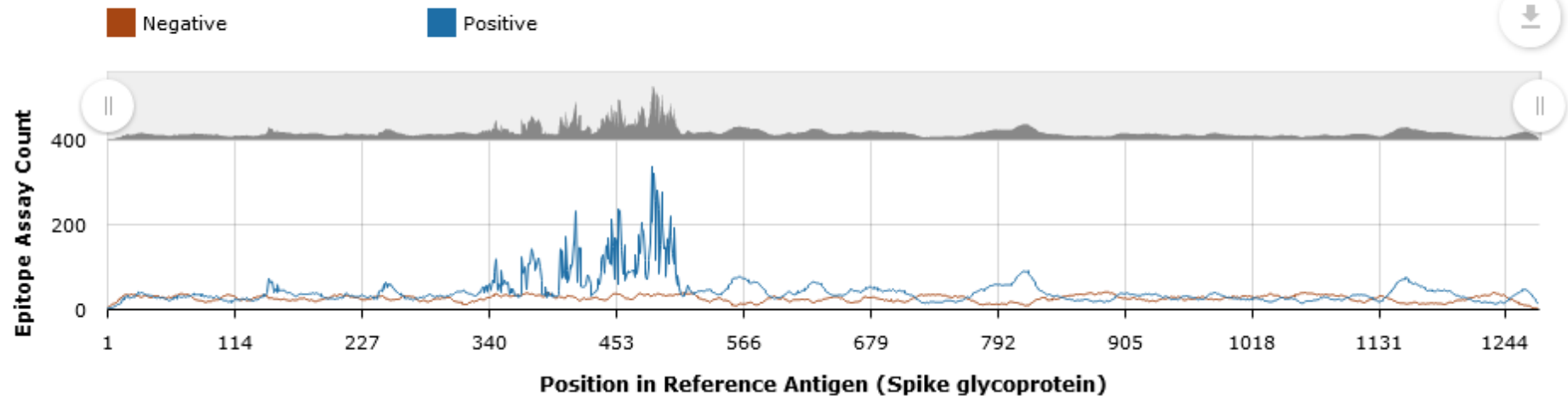
B cell

SARS-CoV2 - Spike glycoprotein ([UniProt:P0DTC2](#))

Current Filters:

No T cell assays

No MHC assays

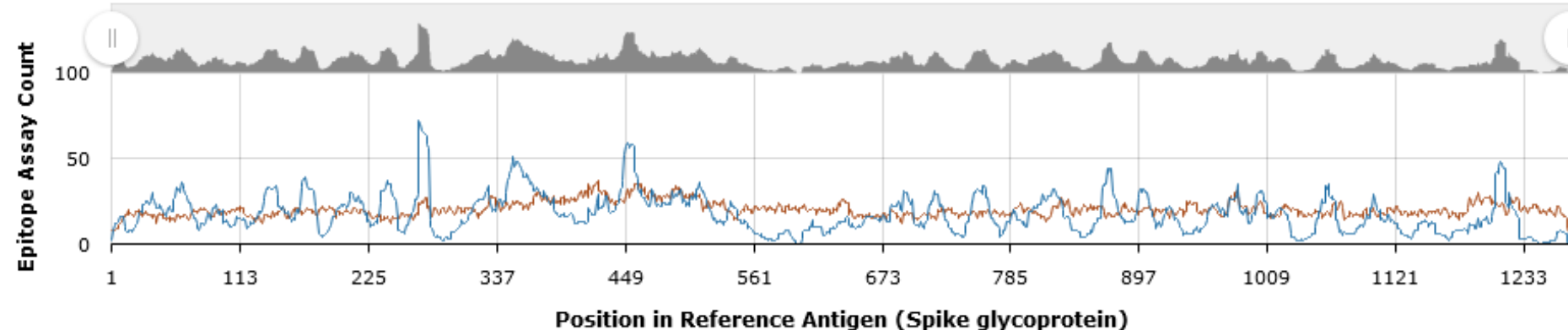


T cell

Current Filters:

No B cell assays

No MHC assays

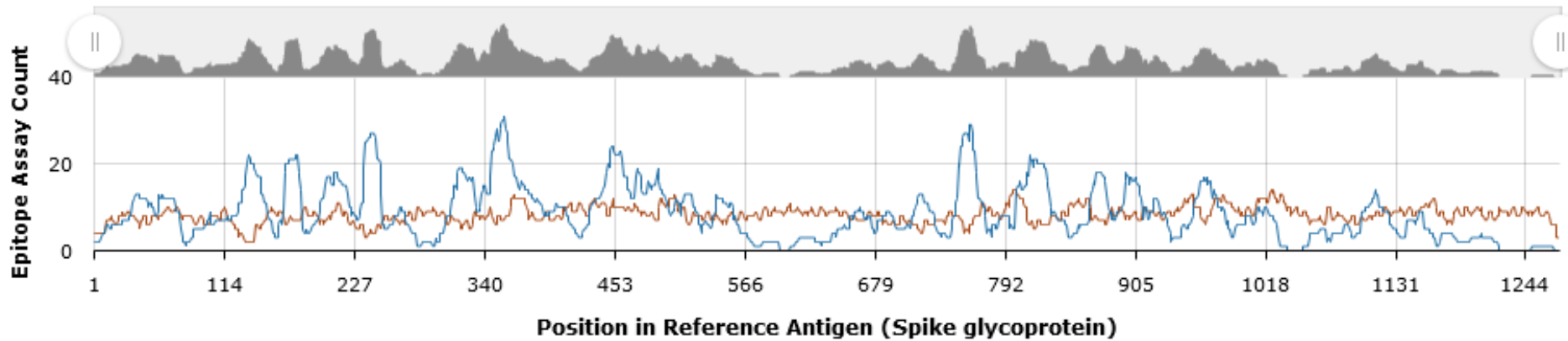


User Queries: How to see the differences between CD4 and CD8 T cell responses

CD4 T cell

SARS-CoV2 - Spike glycoprotein ([UniProt:P0DTC2](#))

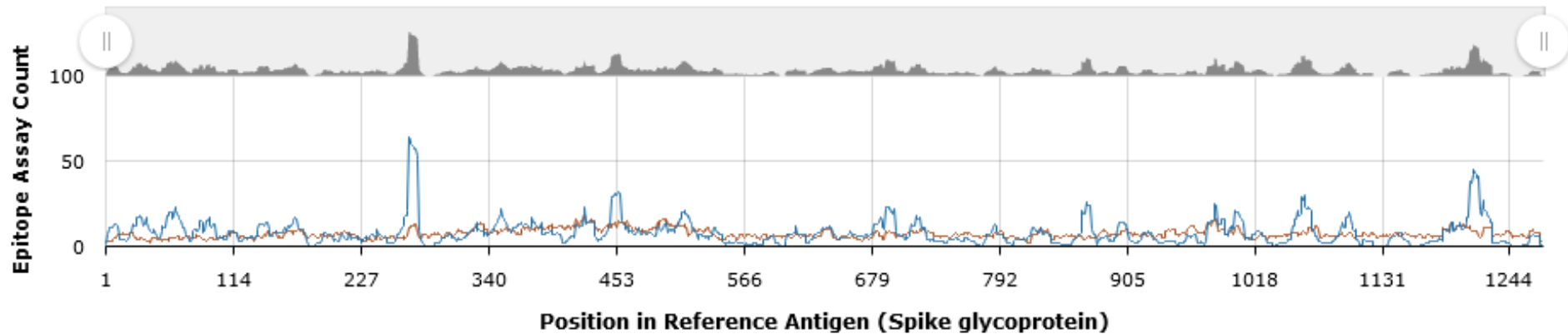
Current Filters:



CD 8 T cell

SARS-CoV2 - Spike glycoprotein ([UniProt:P0DTC2](#))

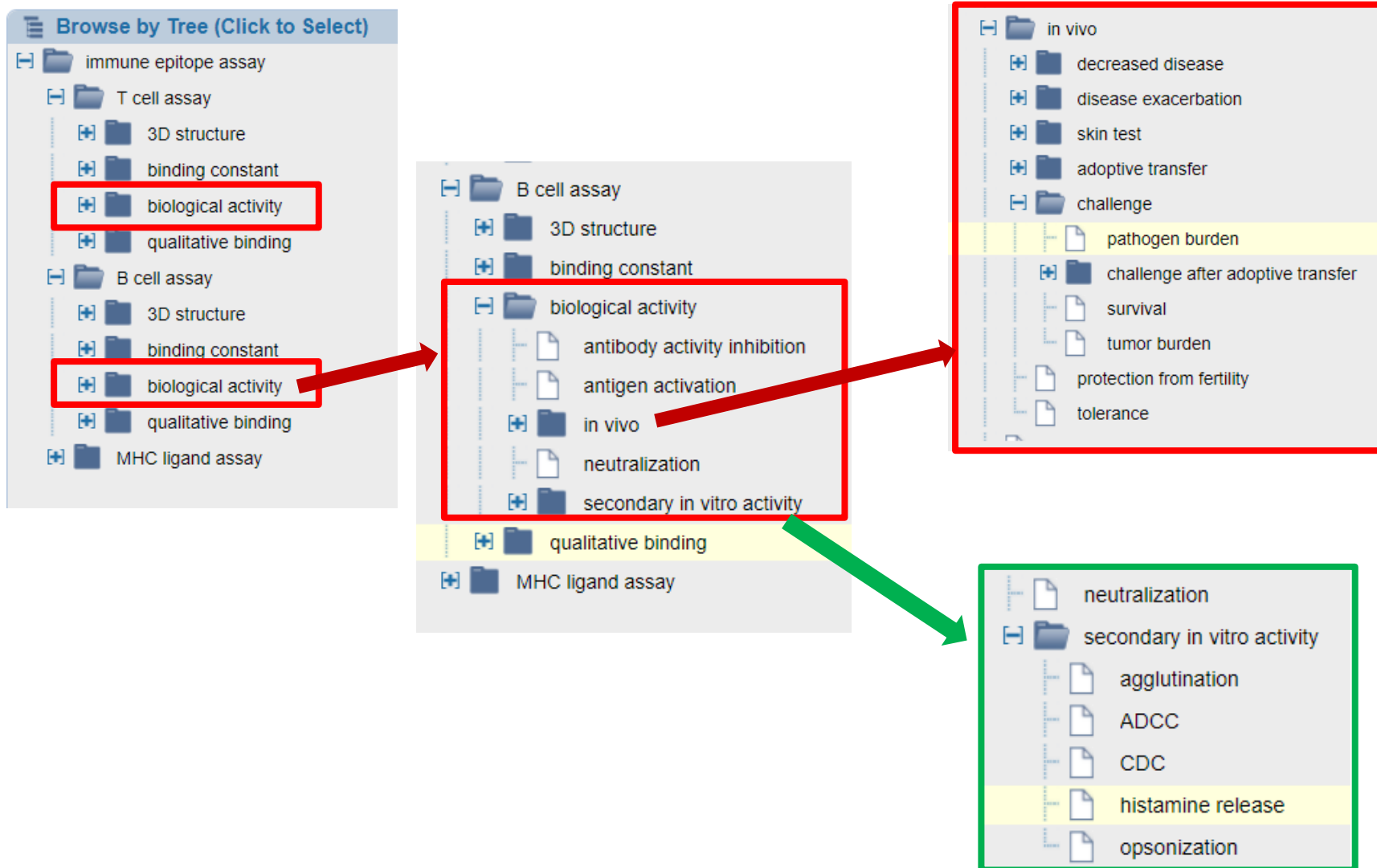
Current Filters:



Additional Slides



User Queries: How can we assess the protective capability of the epitopes of the database?



Exports – Epitope Source Antigen

Source protein isoform of epitope,
author specified, 100% identical

Reference proteome source protein of
epitope, groups all same proteins, not
100% identical

Epitope Antigen Name	Epitope Antigen IRI	Epitope Parent Protein	Epitope Parent Protein IRI
polyprotein	http://www.ncbi.nlm.nih.gov/protein/ABR25251.1	sp P27958 POLG_HCVH Genome polyprotein OS=Hepatitis C virus genotype 1a (isolate H)	http://www.uniprot.org/uniprot/P27958
polyprotein	http://www.ncbi.nlm.nih.gov/protein/ABR25251.1	sp P27958 POLG_HCVH Genome polyprotein OS=Hepatitis C virus genotype 1a (isolate H)	http://www.uniprot.org/uniprot/P27958
NP	http://www.ncbi.nlm.nih.gov/protein/Q91UL1	sp P03466 NCAP_I34A1 Nucleoprotein OS=Influenza A virus (strain A/Puerto Rico/8/1934 H1N1)	http://www.uniprot.org/uniprot/P03466
60S ribosomal protein L28 isoform 2	http://www.ncbi.nlm.nih.gov/protein/NP_000982.2	sp P46779 RL28_HUMAN 60S ribosomal protein L28 OS=Homo sapiens OX=9606 GN=RPL28 PE=1 SV=3	http://www.uniprot.org/uniprot/P46779
polyprotein	http://www.ncbi.nlm.nih.gov/protein/ABY67667.1	sp P27958 POLG_HCVH Genome polyprotein OS=Hepatitis C virus genotype 1a (isolate H)	http://www.uniprot.org/uniprot/P27958
60S ribosomal protein L8	http://www.ncbi.nlm.nih.gov/protein/NP_000964.1	sp P62917 RL8_HUMAN 60S ribosomal protein L8 OS=Homo sapiens OX=9606 GN=RPL8 PE=1 SV=2	http://www.uniprot.org/uniprot/P62917
K1 glycoprotein	http://www.ncbi.nlm.nih.gov/protein/AAT44989.1	sp Q2HRD5 K1_HHV8P Protein K1 OS=Human herpesvirus 8 type P (isolate GK18) OX=868565	http://www.uniprot.org/uniprot/Q2HRD5
K1 glycoprotein [Human herpesvirus 8]	http://www.ncbi.nlm.nih.gov/protein/AAT44977.1	sp Q2HRD5 K1_HHV8P Protein K1 OS=Human herpesvirus 8 type P (isolate GK18) OX=868565	http://www.uniprot.org/uniprot/Q2HRD5
alpha-actin	http://www.ncbi.nlm.nih.gov/protein/AAA51577.1	sp P62736 ACTA_HUMAN Actin, aortic smooth muscle OS=Homo sapiens OX=9606 GN=ACTA2 PE=1	http://www.uniprot.org/uniprot/P62736
cytochrome c oxidase I	https://ontology.iedb.org/ontology/ONTIE_0002983	sp P00395 COX1_HUMAN Cytochrome c oxidase subunit 1 OS=Homo sapiens OX=9606 GN=MT-CO1	http://www.uniprot.org/uniprot/P00395
gag protein	http://www.ncbi.nlm.nih.gov/protein/AAX81417.1	sp P03349 GAG_HV1A2 Gag polyprotein OS=Human immunodeficiency virus type 1 group M subtype B (isolate ARV2/SF2) OX=11685 GN=gag PE=1 SV=3	http://www.uniprot.org/uniprot/P03349

Exports – Epitope Source Organism

Source organism of epitope, author specified

Reference proteome species of epitope, groups all same

Epitope Organism Name	Epitope Organism IRI	Epitope Parent Organism	Epitope Parent Organism IRI
Hepacivirus C	http://purl.obolibrary.org/obo/NCBITaxon_11103	Hepacivirus C	http://purl.obolibrary.org/obo/NCBITaxon_11103
Hepacivirus C	http://purl.obolibrary.org/obo/NCBITaxon_11103	Hepacivirus C	http://purl.obolibrary.org/obo/NCBITaxon_11103
Influenza A virus (A/X-31(H3N2))	http://purl.obolibrary.org/obo/NCBITaxon_132504	Influenza A virus	http://purl.obolibrary.org/obo/NCBITaxon_11320
Homo sapiens	http://purl.obolibrary.org/obo/NCBITaxon_9606	Homo sapiens	http://purl.obolibrary.org/obo/NCBITaxon_9606
Hepacivirus C	http://purl.obolibrary.org/obo/NCBITaxon_11103	Hepacivirus C	http://purl.obolibrary.org/obo/NCBITaxon_11103
Homo sapiens	http://purl.obolibrary.org/obo/NCBITaxon_9606	Homo sapiens	http://purl.obolibrary.org/obo/NCBITaxon_9606
Human gammaherpesvirus 8	http://purl.obolibrary.org/obo/NCBITaxon_37296	Human gammaherpesvirus 8	http://purl.obolibrary.org/obo/NCBITaxon_37296
Human gammaherpesvirus 8	http://purl.obolibrary.org/obo/NCBITaxon_37296	Human gammaherpesvirus 8	http://purl.obolibrary.org/obo/NCBITaxon_37296
Homo sapiens	http://purl.obolibrary.org/obo/NCBITaxon_9606	Homo sapiens	http://purl.obolibrary.org/obo/NCBITaxon_9606
Homo sapiens	http://purl.obolibrary.org/obo/NCBITaxon_9606	Homo sapiens	http://purl.obolibrary.org/obo/NCBITaxon_9606
Human immunodeficiency virus 1	http://purl.obolibrary.org/obo/NCBITaxon_11676	Human immunodeficiency virus 1	http://purl.obolibrary.org/obo/NCBITaxon_11676

Exports – Assay Types

Top Header row = Field Group (Reference, Epitope, etc.)

2nd Header Row = Field (terms may repeat)

Separate method and assay group columns allow sorting

IRI is linked to ontology term for assay (OBI ontology)



Assay	Assay	Assay	Assay	Assay	Assay	Assay	Assay	Assay
Location of assay data in the manuscript	Method/Technique	Assay Group	Units	Assay Type IRI	Qualitative Measure	Measurement Inequality	Quantitative measurement	
Fig. 4A	lysate MHC/direct/radioactivity	qualitative binding		http://purl.obolibrary.org/obo/OBI_0001556	Positive			
Figure 4	cellular MHC/direct/fluorescence	qualitative binding		http://purl.obolibrary.org/obo/OBI_0001606	Positive			
Figure 4	cellular MHC/direct/fluorescence	qualitative binding		http://purl.obolibrary.org/obo/OBI_0001606	Positive			
Figures 2 and 5, table III	cellular MHC/direct/fluorescence	half life	min	http://purl.obolibrary.org/obo/OBI_0001559	Positive		2520	
Figures 2 and 5, table III	cellular MHC/direct/fluorescence	half life	min	http://purl.obolibrary.org/obo/OBI_0001559	Positive		2220	
	purified MHC/direct/fluorescence	dissociation constant KD (~EC50)	nM	http://purl.obolibrary.org/obo/OBI_0001543	Positive-Low	>	5000	
Figure 4 and table II	cellular MHC/direct/fluorescence	half maximal effective concentration (EC50)	nM	http://purl.obolibrary.org/obo/OBI_0001561	Positive		5000	
Figure 4 and table II	cellular MHC/direct/fluorescence	half maximal effective concentration (EC50)	nM	http://purl.obolibrary.org/obo/OBI_0001561	Positive		7000	
Figure 4	cellular MHC/direct/fluorescence	half maximal effective concentration (EC50)	nM	http://purl.obolibrary.org/obo/OBI_0001561	Positive-High	=	4000	
Figure 4	cellular MHC/direct/fluorescence	half maximal effective concentration (EC50)	nM	http://purl.obolibrary.org/obo/OBI_0001561	Positive-High	=	3000	
Figures 2 and 4	cellular MHC/direct/fluorescence	qualitative binding		http://purl.obolibrary.org/obo/OBI_0001606	Positive-High			
Figure 2	cellular MHC/direct/fluorescence	qualitative binding		http://purl.obolibrary.org/obo/OBI_0001606	Positive-High			
Figure 2	cellular MHC/direct/fluorescence	qualitative binding		http://purl.obolibrary.org/obo/OBI_0001606	Positive-High			
Figure 2	cellular MHC/direct/fluorescence	qualitative binding		http://purl.obolibrary.org/obo/OBI_0001606	Positive-Low			
Figure 2	cellular MHC/direct/fluorescence	qualitative binding		http://purl.obolibrary.org/obo/OBI_0001606	Positive-High			
Figure 7 and Tables 1, 2, and 3	cellular MHC/direct/fluorescence	half maximal effective concentration (EC50)	nM	http://purl.obolibrary.org/obo/OBI_0001561	Positive-Low	=	94000	
Figure 7 and Tables 1, 2, and 3	cellular MHC/direct/fluorescence	half maximal effective concentration (EC50)	nM	http://purl.obolibrary.org/obo/OBI_0001561	Positive-Low	=	136000	
Figure 7 and Tables 1, 2, and 3	cellular MHC/direct/fluorescence	half maximal effective concentration (EC50)	nM	http://purl.obolibrary.org/obo/OBI_0001561	Positive-Low	=	132000	
Figure 7 and Tables 1, 2, 3, and 4	cellular MHC/direct/fluorescence	half maximal effective concentration (EC50)	nM	http://purl.obolibrary.org/obo/OBI_0001561	Positive-Intermediate	=	43000	
Figure 7 and Tables 1, 2, 3, and 4	cellular MHC/direct/fluorescence	half maximal effective concentration (EC50)	nM	http://purl.obolibrary.org/obo/OBI_0001561	Positive-High	=	9000	
Figure 7 and Tables 1, 2, and 3	cellular MHC/direct/fluorescence	half maximal effective concentration (EC50)	nM	http://purl.obolibrary.org/obo/OBI_0001561	Positive-Low	=	77000	
Table 2	cellular MHC/direct/fluorescence	half maximal effective concentration (EC50)	nM	http://purl.obolibrary.org/obo/OBI_0001561	Positive-High	=	16000	

Results Page: Discontinuous Epitopes

B cell assays only = B cell epitopes

Epitopes (4347)		Antigens (13)		Assays (9492)		Receptors (27)		References (149)	
Go To Records Starting At <input type="text" value="1200"/> <input type="button" value="GO"/>						Export Results			
4347 Records Found						Page <input type="text" value="1"/> of 174		25 <input type="text"/> Per Page	
Details	Epitope	Antigen	Organism	# References	# Assays				
	E484	Spike glycoprotein	SARS-CoV2	4	12				
	N501	Spike glycoprotein	SARS-CoV2	4	11				
	ECDIPIGAGICASYQ	Spike glycoprotein	SARS-CoV2	3	4				
	KPSKRSFIEDLLFNK	Spike glycoprotein	SARS-CoV2	3	5				
	TESNKKFLPFQQFGRDIA	Spike glycoprotein	SARS-CoV2	3	4				
	R346, N440, L441, K444, V445, G446, N448, Y449, Q4...	Spike glycoprotein	SARS-CoV2	3	19				
	AIVLQLPQGTTLPKG	Nucleoprotein	SARS-CoV2	3	6				
	CASYQTQTNSPRRAR	Spike glycoprotein	SARS-CoV2	3	6				
	QRVAGDSGFAAYSRY	Membrane protein	SARS-CoV2	3	4				
	F486, N487	Spike glycoprotein	SARS-CoV2	3	13				
	FSQILPDPSKPSKRSFIE	Spike glycoprotein	SARS-CoV2	3	5				
	E484	Spike glycoprotein	SARS-CoV2	3	9				
	K417	Spike glycoprotein	SARS-CoV2	3	6				
	EPIYDEPTTTTSVPL	ORF3a protein	SARS-CoV2	3	6				
	AVKLQNNELSPVALR	Replicase polyprotein 1ab	SARS-CoV2	2	4				

User Query: What protein are B cell epitope residues in reference to?

Epitope		
Epitope ID	1314086	IEDB_epitope:1314086
Chemical Type	Discontinuous peptide	
Source Name	surface glycoprotein [Severe acute respiratory syndrome coronavirus 2]	GenPept:QHD43416.1 
Source Organism	SARS-CoV2	NCBITaxon:2697049 
Discontinuous Residues	F486, N487	

Epitope Reference Details		
Epitope Structure Defines	Partial Epitope	
Epitope Name	Epitope of COV2-2196 on SARS-CoV-2	
Reference Region	F486, N487	
Location of Data in Reference	Figure 3	

