



# Immune Epitope Database Overview

[www.iedb.org](http://www.iedb.org)

Presented by: Alessandro Sette, IEDB Principal Investigator

# Our goals for this user workshop

## **We want your input to make the IEDB better:**

- Learn about real-life applications for the IEDB
- Identify and prioritize problems with the user interface, documentation, functionality etc.

## **We want to enable you to get the most out of the IEDB:**

- The primary IEDB success metric is usage
- Best compliment for our program is if IEDB data & tools help in your research (citations)

# Immune Epitope Database

[www.iedb.org](http://www.iedb.org)

**Database** | Resource of experimentally-derived epitope information

- Allergens
  - Infectious diseases
  - Autoimmune diseases
  - Transplantation / Alloantigens
- ... and more



Containing data on over **1.5 million unique structures** analyzed in over **4.7 million assays** from more than **22,300 curated references.**

# Minimal Criteria for Epitope Inclusion

- Linear peptide <50 amino acids in length
- Tested as an immunogen or an antigen
- Discontinuous residues shown to be important in recognition
- Non-peptidic epitopes <5,000 Daltons
- Minimal information required (sequence, outcome, host, etc.)

# Consistent data entry requires well defined data structure

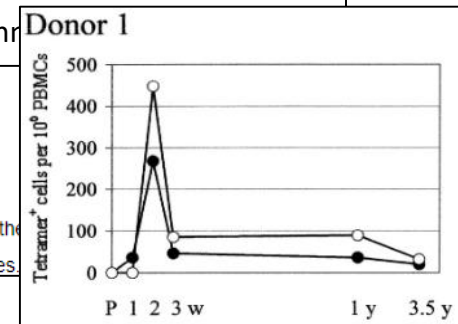
## Quantitation of CD8+ T Cell Responses to Newly Identified HLA-A\*0201–restricted T Cell Epitopes Conserved Among Vaccinia and Variola (Smallpox) Viruses

Masanori Terajima, John Cruz, Gregory Raines, Elizabeth D. Kilpatrick, Jeffrey S. Kennerly, Francis A. Ennis

### Materials And Methods

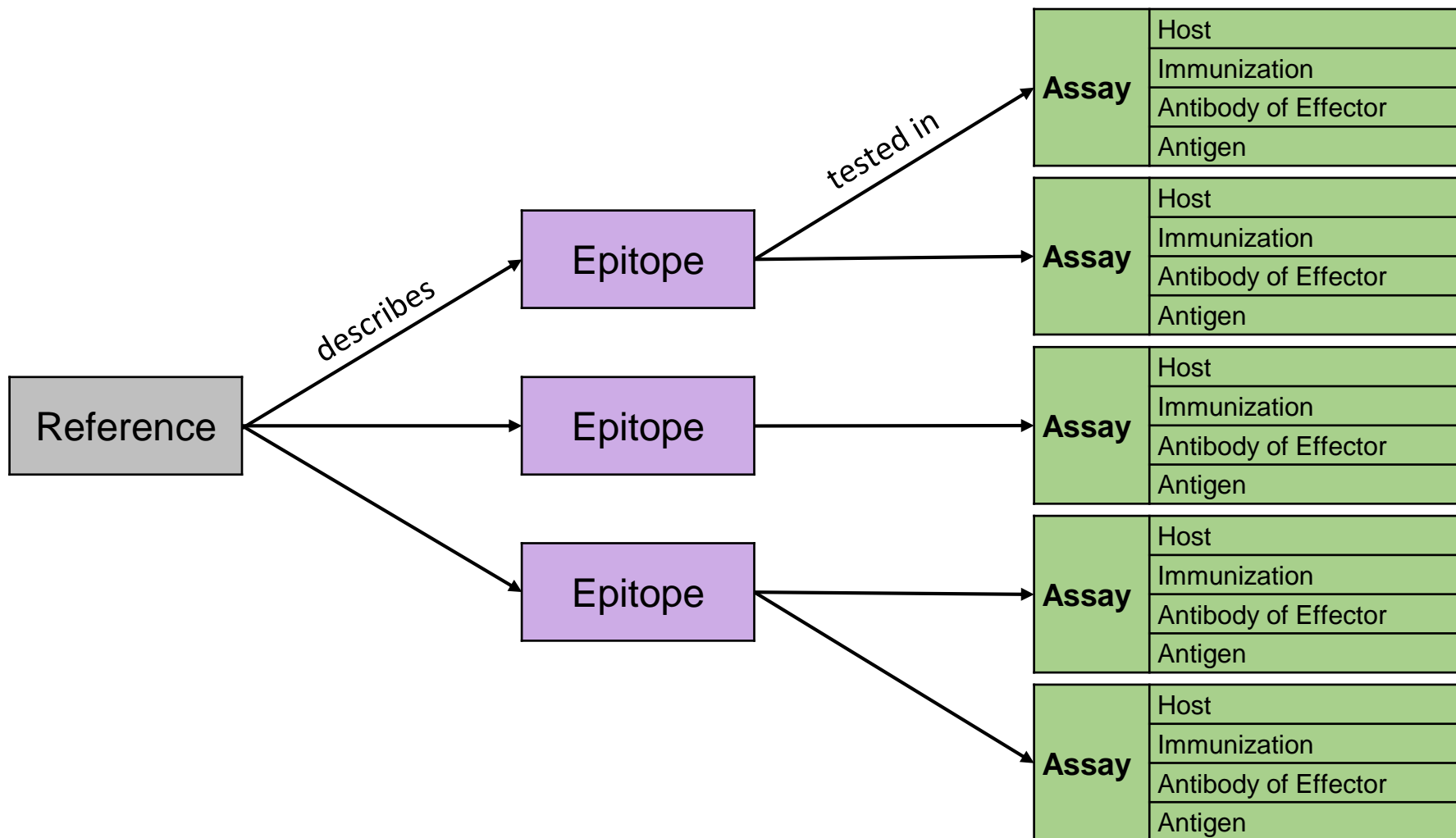
#### Donors.

Donors in this study were three HLA-A\*0201–positive laboratory workers received primary immunization by scarification with the licensed smallpox vaccine, Dryvax®, as recommended by the Centers for Disease Control and Prevention for laboratory personnel working with vaccinia viruses.



Epitope	Structure	Name	74A
		Chemical Type	Peptide / Protein
		Sequence	CLTEYILWV
		Domain / Region	Defined Epitope
	Source	Species	Vaccinia Virus Ankara
		Strain	Ankara (MVA)
		Antigen	Putative 21.7k protein
		Antigen Accession	2772819
Context	Immunization	Antigen Positions	79-87
		Immunized Species	Homo sapiens
		Immunogen Type	Source species
	Assay	Administration	Scarification
		Antigen Type	Epitope
		Assay Type	ELISPOT
		Response Measured	Cytokine Release-IFN-g
		MHC Allele	HLA-A*0201

# Data Structure: A Database of Experiments

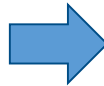


# Collaborations with Ontologies

- Provides standardized nomenclature, definitions, synonyms, and hierarchical relationships
- Makes curation easier → Finders
- Enhances user experience → Finders
- Ensures consistency and accuracy
- Finds errors
- Facilitates interoperability

# External Resources and Ontologies

<b>Peptidic Epitope</b>	Amino acid sequence
	Protein source
	Organism source



Human herpesvirus 5 (HHV-5)  
 NCBI  
 taxon:10359

**ORGANISM FINDER** ✕

Current Selection(s) Reset Apply

**Search By**

Name:

Organism ID:

Clear Search

**Browse by Tree (Click to Select)** +

- + Human herpesvirus 1
- + Human herpesvirus 2
- + Human herpesvirus 4 (Epstein Barr virus)
- + Human herpesvirus 5 (Human cytomegalovirus)
- Human herpesvirus 5 (strain RV798)
- Human herpesvirus 5 TB40
- Human herpesvirus 5 strain AD169
- Human herpesvirus 5 strain Merlin
- Human herpesvirus 5 strain Toledo

---

**Search Results (Click to Select)**

6 Records Found Page 1 of 2 5 Per Page

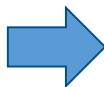
Organism Name	Synonyms	Organism ID
Cucumber mosaic virus (cucumber mosaic cucumovirus)	Cucumber mosaic virus, cucumber mosaic cucumovirus, cucumber mosaic virus CMV, cucumber mosaic cucumovirus CMV, cucumber mosaic virus, CMV, CMV	12305
Lymphocytic choriomeningitis mammarenavirus	Lymphocytic choriomeningitis mammarenavirus, Lymphocytic choriomeningitis virus, lymphocytic choriomeningitis virus LCMV, LCMV	11623
Murid betaherpesvirus 1 (Murine cytomegalovirus)	Murine cytomegalovirus, Murid betaherpesvirus 1, murine herpesvirus 1, murine cytomegalovirus MCMV, murine cytomegalovirus (MCMV), Murid herpesvirus 1, Mouse cytomegalovirus 1	10366
Human herpesvirus 5 (Human cytomegalovirus)	herpes virus 5,CMV,HHV5,HSV-5,HSV5, Human cytomegalovirus, Human betaherpesvirus 5, human herpesvirus type 5, Human herpesvirus 5, HHV-5	10359
Rhesus cytomegalovirus strain 68-1 (Rhesus cytomegalovirus (strain 68-1) (RhCMV))	Rhesus cytomegalovirus strain 68-1, Rhesus cytomegalovirus (strain 68-1) (RhCMV), Rhesus cytomegalovirus (strain 68-1)	103930

6 Records Found Page 1 of 2 5 Per Page



# External Resources and Ontologies

<b>Peptidic Epitope</b>	Amino acid sequence
	Protein source
	Organism source



PKYVKQNTLKLAT  
 hemagglutinin HA1  
 GenBank/UniProt  
 GI:AAL62329.1—UniProt:Q8V285

**MOLECULE FINDER**

Current Selection(s) Reset Apply

**Search By**

Name:

Molecule ID:

Source Organism:  Finder

Search

**Browse by Tree (Click to Select)**

- [-] Bacteriophage (RNA) protein
- [-] Influenza virus protein
  - [-] Influenza A virus protein
    - [-] Hemagglutinin
      - signal peptide (1-17)
      - mature protein (18-565)
      - Hemagglutinin HA1 chain (18-342)
      - Hemagglutinin HA2 chain (344-565)
      - Matrix protein 1

**Search Results (Click to Select)**

53 Records Found Page 1 of 11 5 Per Page

Molecule Name	Synonyms	Database ID	Organism Name
Influenza A virus protein	influenza A, Influenza A virus, Human Influenza A Virus, Influenza virus type A, FLUAV	IEDB [11320]	Influenza A virus
Influenza B virus (Influenza virus type B) protein	Influenza B virus, Influenza virus type B, FLUBV	IEDB [11520]	Influenza B virus (Influenza virus type B)
Influenza C virus (Influenza C viruses) protein	Influenza C viruses, Influenza C virus, Influenza virus type C, FLUCV	IEDB [11552]	Influenza C virus (Influenza C viruses)

# Literature Curation

## PubMed / PDB

- Complex query
- Bi-weekly

**240K retrieved**

## Classifier

- Content based categories
- Retrained annually

**151K epitope related**

## Abstract Review

- Manual scan
- Confirmation of classification

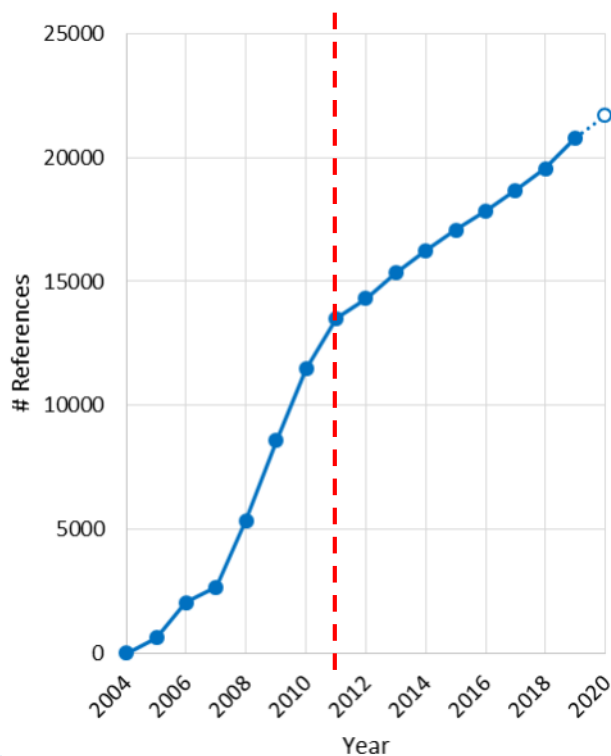
**44K likely curatable**

## Manual Curation

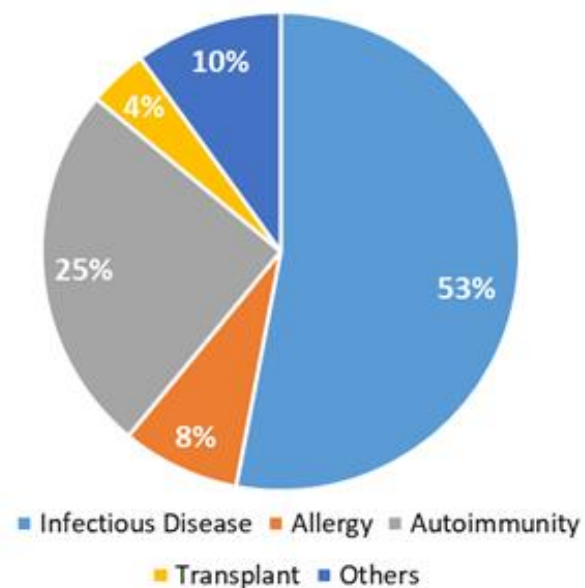
- Assigned to curators
- Peer review

**22K curated**

**Growth of Curated References**



**Categorical Breakdown of Curated References**



# Consistency and Quality Control Measures

- Manually curated by a team of PhD-level scientists with specific expertise
- Formal curation guidelines and peer review  
Curation Manual: [http://curationwiki.iedb.org/wiki/index.php/Main\\_Page](http://curationwiki.iedb.org/wiki/index.php/Main_Page)
- External immunological experts
- Built in validation in the curation application

# Data Submissions

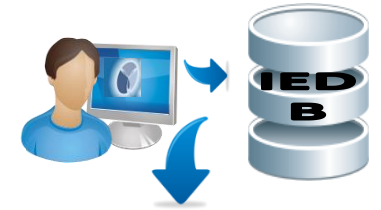
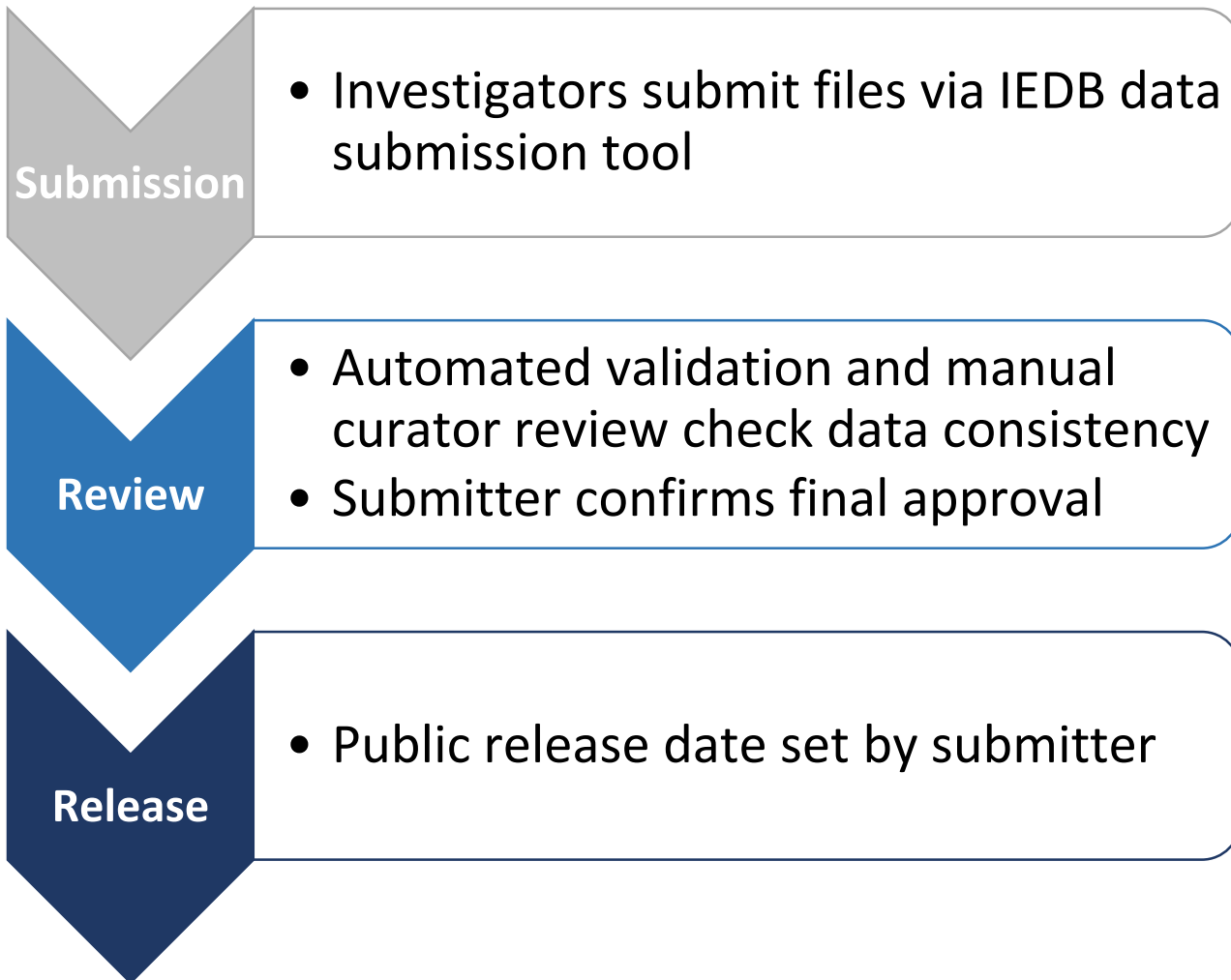
- Primarily sourced through NIAID Epitope Discovery contracts
- Data deposition is open to the general research community on a case-by-case basis

As of October, 2021:

- Data from **319 submissions** is publicly available & **96 submissions** are in process or on-hold
- Submitted data comprises **23% of epitopes** available in the IEDB

Inquire by contacting: [nblazeska@lji.org](mailto:nblazeska@lji.org) or  
[submissionsupport@iedb.org](mailto:submissionsupport@iedb.org)!

# Direct Submission Process



# IEDB.org: Homepage & Cumulative Data



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Specialized Searches

Analysis Resource

Try out the IEDB's new [beta-version query API here!](#) 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

AAAAI Virtual Booth Feb 26-  
Mar 1, 2021

[Virtual User Workshop](#) Oct 28-29 &  
Nov 3-4, 2021

\* register [here](#)

## Summary Metrics

Peptidic Epitopes	1,044,049
Non-Peptidic Epitopes	3,113
T Cell Assays	404,053
B Cell Assays	568,513
MHC Ligand Assays	3,129,103
Epitope Source Organisms	4,063
Restricting MHC Alleles	904
References	22,153

## START YOUR SEARCH HERE

### Epitope

- Any  
 Linear peptide

Exact IV

- Discontinuous  
 Non-peptidic



### Assay

- T Cell  
 B Cell  
 MHC Ligand

Ex: neutralization

Outcome:  Positive  Negative



### Epitope Source

Organism

Ex: influenza, peanut

Antigen

Ex: core, capsid, myosin



### 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



Reset

Search

## 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](#)

# IEDB.org: Homepage & Search Interface



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Epitope Source Organisms	4,063
Restricting MHC Alleles	904
References	22,153

## START YOUR SEARCH HERE ?

### Epitope ?

- Any  
 Linear peptide  
 Discontinuous  
 Non-peptidic
- Exact M



### Assay ?

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



### Epitope Source ?

Organism



Antigen

### 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



Reset

Search

## Epitope Analysis Resource

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Scan an antigen sequence for amino acid patterns indicative of:

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- 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

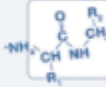
### Epitope Analysis Tools ?

Analyze epitope sets of:


- Population Coverage
- Conservation Across Antigens
- Clusters with Similar Sequences

# Example Query: HBV T Cell Epitopes in Humans


**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  
   
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 Summarized in Tables

IMMUNE EPITOPE DATABASE AND ANALYSIS RESOURCE

Home | Specialized Searches | Analysis Resource | Help | More IEDB

Pending Filters: **Current Filters:** Organism: Hepatitis B virus (hepatitis B virus (HBV)) (ID:10407\_HBV) Include Positive Assays No B cell assays No MHC assays Host: Homo sapiens (human)

Reset Search

Filter Options T Cell

Epitopes (471) | Antigens (5) | Assays (1508) | Receptors (3235) | References (150)

Go To Records Starting At 1200 GO | Export Results ↗

471 Records Found | Page 1 of 19 GO | 25 Per Page

Details	Epitope	Antigen	Organism	# References	# Assays
	16833  SDFFPSV	External core antigen	Hepatitis B virus (hepatitis B virus (HBV))	62	163
	72794 WLSLLVPFV	Large envelope protein	Hepatitis B virus (hepatitis B virus (HBV))	28	58
	16755 FLLTRILTI	Large envelope protein	Hepatitis B virus (hepatitis B virus (HBV))	24	77
	16751 FLLSLGIHL	Protein P	Hepatitis B virus (hepatitis B virus (HBV))	15	24
	21145 GLSRYVARL	Protein P	Hepatitis B virus (hepatitis B virus (HBV))	12	30
	21139 GLSPTWLSV	Large envelope protein	Hepatitis B virus (hepatitis B virus (HBV))	10	17
	15061 EYLVSGVW	External core antigen	Hepatitis B virus (hepatitis B virus (HBV))	8	15
	34616 KYTSFPWLL	Protein P	Hepatitis B virus (hepatitis B virus (HBV))	8	13
	59585 SLYADSPSV	Protein P	Hepatitis B virus (hepatitis B virus (HBV))	8	15
	16832 FLPSDFFPSI	External core antigen	Hepatitis B virus (hepatitis B virus (HBV))	7	14
	37187 LLDYQGMLPV	Large envelope protein	Hepatitis B virus (hepatitis B virus (HBV))	7	9
	61745 STLPEITVRRR	Capsid protein	Hepatitis B virus (hepatitis B virus (HBV))	6	11
	69524 VLHKRTLGL	Protein X	Hepatitis B virus (hepatitis B virus (HBV))	6	6
	38701 LPSDFFPSV	External core antigen	Hepatitis B virus (hepatitis B virus (HBV))	5	14
	58740 SIVSPFIPLL	Large envelope protein	Hepatitis B virus (hepatitis B virus (HBV))	5	31
	75040 YMDDWLGA	Protein P	Hepatitis B virus (hepatitis B virus (HBV))	5	11
	5191 ATVELLSFLPSDFFPSV	External core antigen	Hepatitis B virus (hepatitis B virus (HBV))	4	7
	6556 CLFKDWEEL	Protein X	Hepatitis B virus (hepatitis B virus (HBV))	4	6
	15848 FLLTRILTI	Large envelope protein	Hepatitis B virus (hepatitis B virus (HBV))	4	9
	15849 FLLTRILTIPOSLED	Large envelope protein	Hepatitis B virus (hepatitis B virus (HBV))	4	11
	37120 LLLCLFLV	Large envelope protein	Hepatitis B virus (hepatitis B virus (HBV))	4	5
	62477 SWLSLLVPF	Large envelope protein	Hepatitis B virus (hepatitis B virus (HBV))	4	6
	178829 FLGPLLVLQA	Large envelope protein	Hepatitis B virus (hepatitis B virus (HBV))	4	13
	2002 AILSKTGDPV	Large envelope protein	Hepatitis B virus (hepatitis B virus (HBV))	3	4
	5911 AYRPPNAPILSTLPE	External core antigen	Hepatitis B virus (hepatitis B virus (HBV))	3	3

471 Records Found | Page 1 of 19 GO | 25 Per Page | Export Results ↗

Go To Records Starting At 1200 GO

Filter Options:  Any,  Linear peptide, Length, Sequence,  Discontinuous,  Non-peptidic,  3D structure available, Amino acid modification

Epitope Source: Organism: Hepatitis B virus (hepatitis 1), Antigen: Ex: core, capsid, myosin, Include related structure: Select multiple options

TCR:  Has TCR sequence, Type: Any Type,  Paired chains only, Chain: Any Type, Sequence: Exact Matches

T Cell Assay

# Detail Pages Summarize Relevant Information

## Details Pages:

- Epitope Summary
- Compiled Data
  - MHC Ligand Assay(s)
  - B Cell Assay(s)
  - T Cell Assay(s)
- External Resources

## Also available for:

- Assays
- Receptors
- References

### EPITOPE SUMMARY

FLPSDFFFPSV is a linear peptidic epitope (epitope ID 16833) studied as part of External core antigen from Hepatitis B virus (hepatitis B virus (HBV)) and Capsid protein from Hepatitis B virus (hepatitis B virus (HBV)). This epitope has been studied for immune reactivity in 101 publication(s), tested in 215 T cell assays, 8 B cell assays, 88 MHC ligand assays and has 3D structure(s) 3OXR, 3OXS, 1HHH and 3OX8.

### COMPILED DATA

#### MHC Ligand Assay(s) 88

MHC molecule	Positive / All
HLA-A*02:01	35/35
HLA-A*02:03	8/8
HLA-A*02:06	8/8
HLA-A*02:02	6/6
HLA-A*02:07	4/4
HLA-A*68:02	4/4
HLA-A*03:01	0/3
HLA-A*11:01	0/3
HLA-A*02:05	2/2
HLA-A*01:01	0/2
HLA-B*07:02	0/2
HLA-B*15:02	0/2
HLA-A*02:04	1/1
HLA-A*02:11	1/1
HLA-A2	1/1
HLA-B44	1/1
H2-Kd	0/1
HLA-A*24:02	0/1
HLA-A*31:01	0/1
HLA-A*68:01	0/1
Mamu-A1*001:01	0/1




#### B Cell Assay(s) 8

Assay Type	Positive / All
qualitative binding	7/7
dissociation constant KD	1/1

#### T Cell Assay(s) 215

Assay Type	Positive / All
cytotoxicity	63/74
IFNg release	65/66
qualitative binding	45/50
TNFa release	7/8
IL-2 release	4/4
proliferation	4/4
IL-4 release	2/2
TNF release	2/2
activation	1/1

### EXTERNAL RESOURCES

Resource	Link
 ANALYSIS TOOLS IEDB.ORG IEDB-AR: MHC-I Processing	Predict MHC class I processing <a href="#">↗</a>
 ANALYSIS TOOLS IEDB.ORG IEDB-AR: MHC-I	Predict MHC class I binding affinity <a href="#">↗</a>
 ANALYSIS TOOLS IEDB.ORG IEDB-AR: B cell scales	Predict B cell epitopes <a href="#">↗</a>

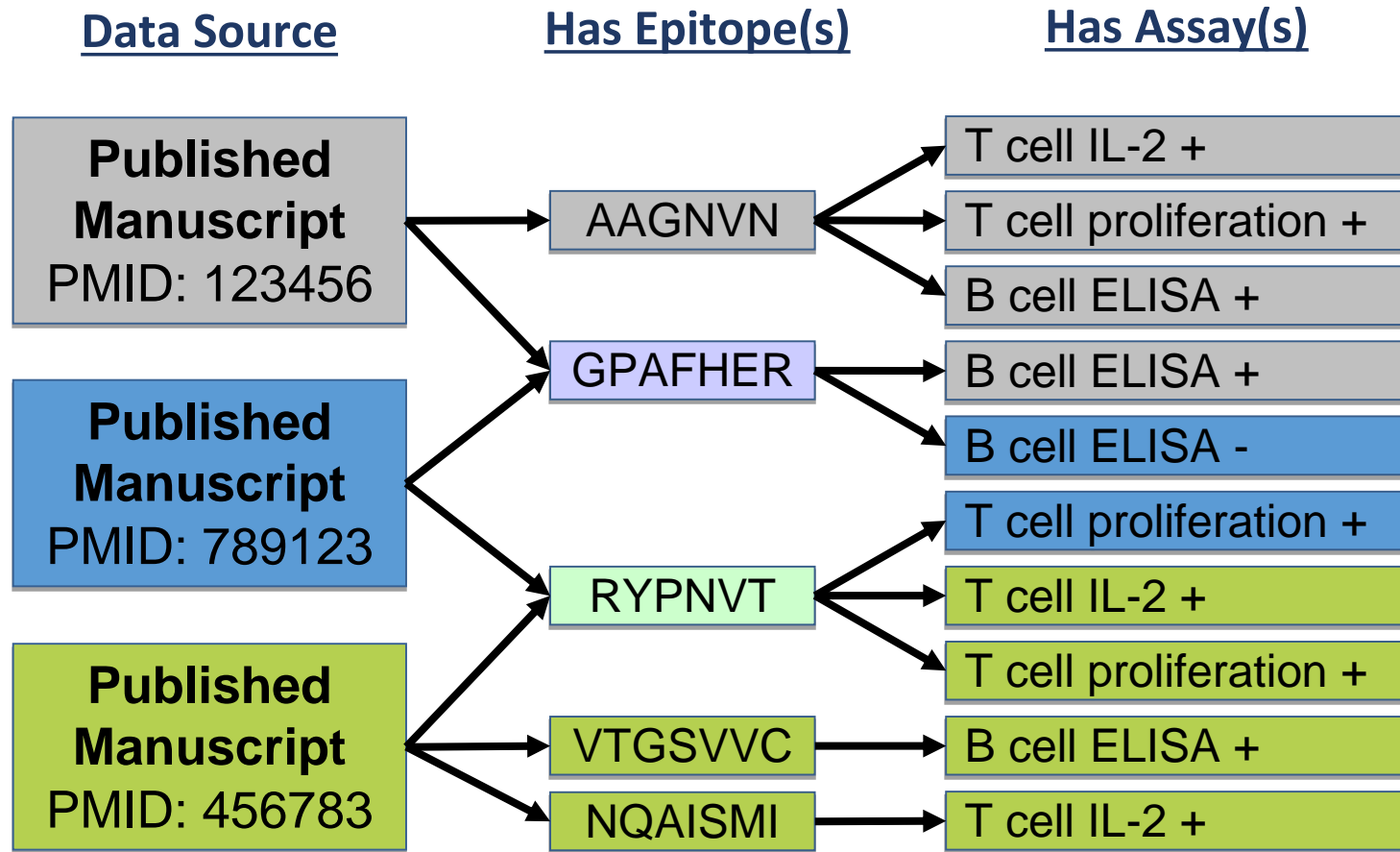
# Antigens: Identifying Protein Source of Epitopes

Current Filters: ✗ Organism: Hepatitis B virus (hepatitis B virus (HBV)) (ID:10407, HBV) ✗ Include Positive Assays ✗ No B cell assays ✗ No MHC assays ✗ Host: Homo sapiens (human)

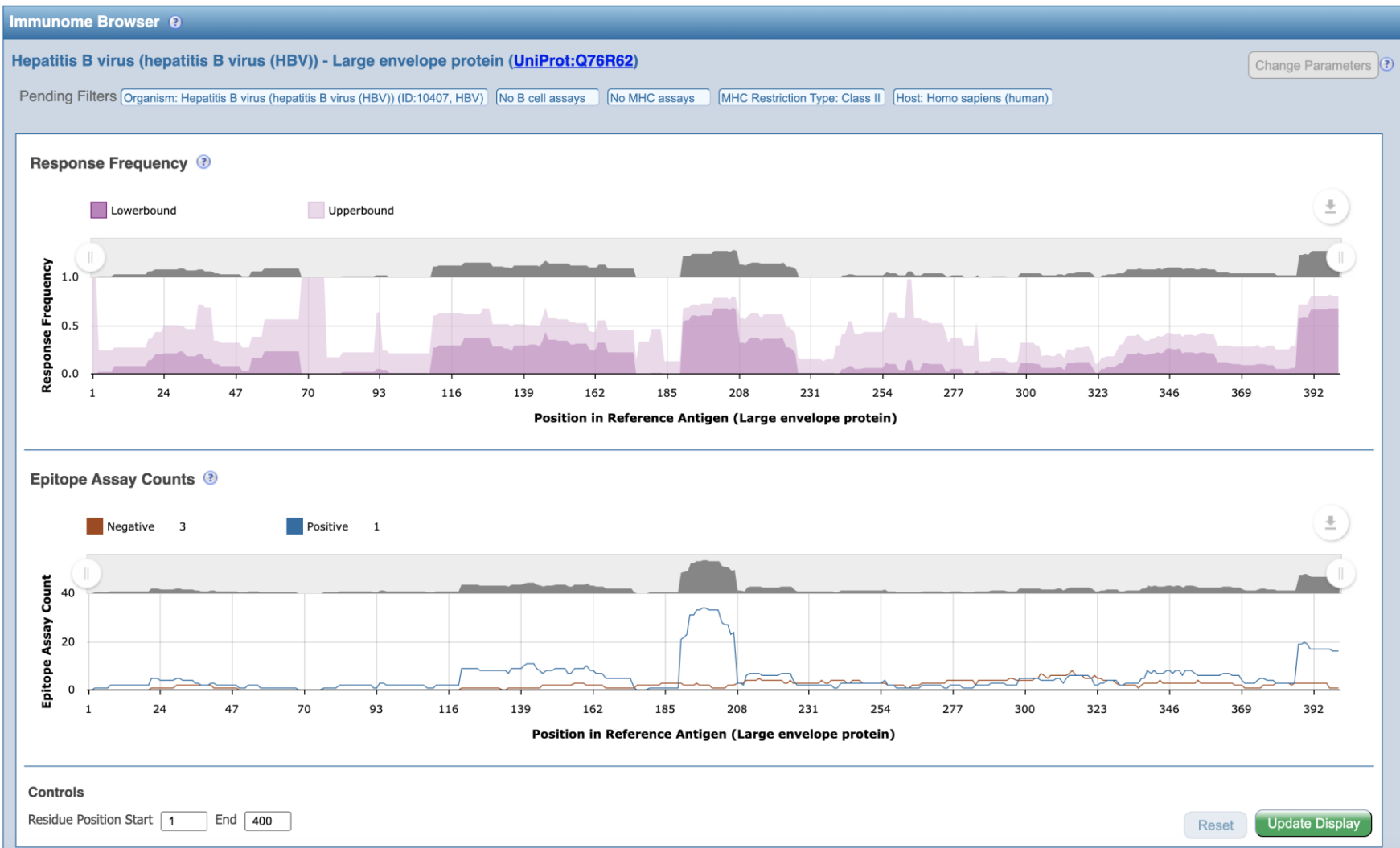
Epitopes (471)		Antigens (5)		Assays (1508)		Receptors (3235)		References (150)	
Go To Records Starting At <input type="text" value="1200"/> <span style="color: green;">GO</span> <span style="float: right;">Export Results </span>									
5 Records Found <span style="float: right;">25 <input type="text"/> Per Page</span>									
Antigen		Organism		# Epitopes	# Assays	# References			
External core antigen		Hepatitis B virus (hepatitis B virus (HBV))		121	410	90			
Large envelope protein		Hepatitis B virus (hepatitis B virus (HBV))		181	680	85			
Protein P		Hepatitis B virus (hepatitis B virus (HBV))		103	262	40			
Capsid protein		Hepatitis B virus (hepatitis B virus (HBV))		41	99	35			
Protein X		Hepatitis B virus (hepatitis B virus (HBV))		33	57	12			
5 Records Found <span style="float: right;">25 <input type="text"/> Per Page</span>									
Go To Records Starting At <input type="text" value="1200"/> <span style="color: green;">GO</span> <span style="float: right;">Export Results </span>									



# Data Aggregation



# ImmuneBrowser: Visualization on Reference Proteins



Also available as a standalone tool on AR!

# Assays: Experiments in which epitopes were tested

Current Filters:  Epitope Structure: Linear Sequence  Linear Sequence: FLPSDFFPSV  Organism: Hepatitis B virus (hepatitis B virus (HBV)) (ID:10407, HBV)  Include Positive Assays  No B cell assays  No MHC assays

Host: Homo sapiens (human)

Epitopes (1)		Antigens (2)		Assays (163)		Receptors (1)		References (62)	
T Cell Assays (163)		B Cell Assays (0)		MHC Ligand Assays (0)					
Go To Records Starting At <input type="text" value="A,b"/> <input type="button" value="GO"/>									
163 Records Found <span style="float: right;">Page 1 of 7 <input type="button" value="GO"/></span> <span style="float: right;">25 Per Page</span>									
ID	Reference	Epitope	Host	Immunization	Assay Antigen	Antigen Epitope Relation	MHC Restriction	Assay Description	
1356209	A Bertoletti; Hepatology 1997	FLPSDFFPSV core protein (18-27) Hepatitis B virus (hepatitis B virus (HBV))	Homo sapiens (human)	Infectious disease via exposure to Hepatitis B virus (hepatitis B virus (HBV)) (Source Organism) followed by restimulation in vitro	FLPSDFFPSV core protein (18-27) Hepatitis B virus (hepatitis B virus (HBV))	Epitope	HLA-DP	3H-thymidine proliferation Positive	
1031085	A Vitiello; J Clin Invest 1995	FLPSDFFPSV core protein (18-27) Hepatitis B virus (hepatitis B virus (HBV))	Homo sapiens (human)	Administration in vivo with FLPSDFFPSV (Epitope)	QYKANSKFIGITE Tetanus toxin precursor (830-843) Clostridium tetani	Other	HLA-A*02:01	3H-thymidine proliferation Positive	
1507988	A Bertoletti; J Exp Med 1994	FLPSDFFPSV core protein (18-27) Hepatitis B virus (hepatitis B virus (HBV))	Homo sapiens (human)	Infectious disease via exposure to Hepatitis B virus (hepatitis B virus (HBV)) (Source Organism) followed by restimulation in vitro	FLPNDFPSPA External core antigen Hepatitis B virus (hepatitis B virus (HBV))	Other Structure from Source Organism	HLA-A*02:01	51 chromium cytotoxicity Positive-Low	
1507999	A Bertoletti; J Exp Med 1994	FLPSDFFPSV core protein (18-27) Hepatitis B virus (hepatitis B virus (HBV))	Homo sapiens (human)	Infectious disease via exposure to Hepatitis B virus (hepatitis B virus (HBV)) (Source Organism) followed by restimulation in vitro	FLPVDFPFSI	Other	HLA-A*02:01	51 chromium cytotoxicity Positive-Low	
1507978	A Bertoletti; J Exp Med 1994	FLPSDFFPSV core protein (18-27) Hepatitis B virus (hepatitis B virus (HBV))	Homo sapiens (human)	Infectious disease via exposure to Hepatitis B virus (hepatitis B virus (HBV)) (Source Organism) followed by restimulation in vitro	FLPNDFPSPA External core antigen Hepatitis B virus (hepatitis B virus (HBV))	Other Structure from Source Organism	HLA-A*02:01	51 chromium cytotoxicity Positive-Low	
1276130	P A Wentworth; Mol Immunol 1995	FLPSDFFPSV core protein (18-27) Hepatitis B virus (hepatitis B virus (HBV))	Homo sapiens (human)	Primary induction in vitro with FLPSDFFPSV (Epitope)	FLPSDFFPSV core protein (18-27) Hepatitis B virus (hepatitis B virus (HBV))	Epitope	HLA-A*02:01	51 chromium cytotoxicity Positive	
1276142	B Reherrmann; J Virol 1996	FLPSDFFPSV core protein (18-27) Hepatitis B virus (hepatitis B virus (HBV))	Homo sapiens (human)	Infectious disease via exposure to Hepatitis B virus (hepatitis B virus (HBV)) (Source Organism) followed by restimulation in vitro	FLPSDFFPSV core protein (18-27) Hepatitis B virus (hepatitis B virus (HBV))	Epitope	HLA-A*02:01	51 chromium cytotoxicity Positive	
1326508	A Cerny; Eur J Immunol 1995	FLPSDFFPSV core protein (18-27) Hepatitis B virus (hepatitis B virus (HBV))	Homo sapiens (human)	Primary induction in vitro with FLPSDFFPSV (Epitope)	FLPSDFFPSV core protein (18-27) Hepatitis B virus (hepatitis B virus (HBV))	Epitope	HLA-A*02:01	51 chromium cytotoxicity Positive	

# Epitope-specific B Cell and T Cell Receptors

Current Filters: ✖ Organism: Hepatitis B virus (hepatitis B virus (HBV)) (ID:10407, HBV) ✖ Include Positive Assays ✖ No B cell assays ✖ No MHC assays ✖ Host: Homo sapiens (human)

Epitopes (471)    Antigens (5)    Assays (1508)    Receptors (3235)    References (150)

T Cell Receptors (3235)    B Cell Receptors (0)

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

3235 Records Found    Page  of 130     Per Page

Group ID	Species	Type	Chain 1 CDR3	Chain 2 CDR3
27823	Homo sapiens (human)	αβ	CAVMADGQKLLF	CASSQTIGTGFNSQOFF
28578	Homo sapiens (human)	αβ	CAVNGANDYKLSF	not available
28776	Homo sapiens (human)	αβ	not available	CASSLGQGGVGEKLF
28777	Homo sapiens (human)	αβ	not available	CASSQQGVWGTGELFF
29227	Homo sapiens (human)	αβ	QHAGEAPTFLSYN	CASSRRRDLGNEQFF
29228	Homo sapiens (human)	αβ	CALDSSASKIIF	CASSYLTGEGDYGTYF
30648	Homo sapiens (human)	αβ	not available	CASSQGLAGKETQYF
30649	Homo sapiens (human)	αβ	not available	CASSQGSQQGYNEQFF
30650	Homo sapiens (human)	αβ	not available	CASSQTEGGIYGTYF
30651	Homo sapiens (human)	αβ	not available	CASSQVAVYSYEQYF
30652	Homo sapiens (human)	αβ	not available	CASSQVPDSYYGTYF
30653	Homo sapiens (human)	αβ	not available	CASSQVTGSNYGYTF
30654	Homo sapiens (human)	αβ	not available	CASSQWVGSYHYGYTF
30655	Homo sapiens (human)	αβ	not available	CASSRGANYGYTF
30656	Homo sapiens (human)	αβ	not available	CASSRGLPPVEQFF
30657	Homo sapiens (human)	αβ	not available	CASSRGTGGYSNQPQHF
30658	Homo sapiens (human)	αβ	not available	CASSRWRGEEKLFF
30659	Homo sapiens (human)	αβ	not available	CASSFSFLGKTYGYTF
30660	Homo sapiens (human)	αβ	not available	CASSSGAGNTEAFF
30661	Homo sapiens (human)	αβ	not available	CASSSGLKMEENIQYF
30662	Homo sapiens (human)	αβ	not available	CASSHGGAKNIQYF
30663	Homo sapiens (human)	αβ	not available	CASSRRDRDTGELFF
30664	Homo sapiens (human)	αβ	not available	CASSRIPRTGLIYEQYF
30665	Homo sapiens (human)	αβ	not available	CASSRNTGANEKLFF
30666	Homo sapiens (human)	αβ	not available	CASSRTRHTGELFF

3235 Records Found    Page  of 130     Per Page

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

# References: Source of Information

**Pending Filters**

Reset Search

**Filter Options**

B Cell

**Epitope**

Any

Linear peptide

Length

Sequence

Discontinuous

Non-peptidic

3D structure available

Amino acid modification

**Epitope Source**

Organism

Hepatitis B virus (Human h<sup>1</sup>)

Antigen

Ex: core, capsid, myosin

Include related structure

Select multiple options

**Antibody/BCR**

Has BCR sequence

Type Any Type

Paired chains only

**Current Filters:**  Organism: Hepatitis B virus (Human hepatitis B virus) (ID:10407, HBV)  Include Positive Assays  No T cell assays  No MHC assays  Host: Homo sapiens (human)

**Epitopes (158)** **Antigens (4)** **Assays (278)** **Receptors (3)** **References (55)**

Go To Records Starting At 1982 GO

Export Results

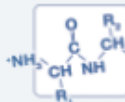
55 Records Found Page 1 of 3 25 Per Page

Ref ID	PMID	Author	Title	Journal	Date
1039372	34406663	Sreya Tarafdar; Maria Luisa Virata; Hailing Yan; Lilin Zhong; Lu Deng; Yanqun Xu; Yong He; Evi Struble; Pei Zhang	Multiple epitopes of hepatitis B virus surface antigen targeted by human plasma-derived immunoglobulins coincide with clinically observed escape mutations.	J Med Virol	2021
1039298	34358170	Jisu Hong; Youngjin Choi; Yoonjoo Choi; Jiwoo Lee; Hyo Jeong Hong	Epitope-Paratope Interaction of a Neutralizing Human Anti-Hepatitis B Virus PreS1 Antibody That Recognizes the Receptor-Binding Motif.	Vaccines (Basel)	2021
1036989	32504577	Qiao Wang; Eleftherios Michailidis; Yingpu Yu; Zijun Wang; Ariene M Hurley; Deena A Oren; Christian T Mayer; Anna Gazumyan; Zhenmi Liu; Yunjiao Zhou; Till Schoofs; Kai-Hui Yao; Jan P Niekte; Jianbo Wu; Qingling Jiang; Chenhui Zou; Mohammad Kabbani; Corrine Quirk; Thiago Oliveira; Kalsang Chhosphei; Qianqian Zhang; William M Schneider; Cyprien Jahan; Tianlei Ying; Jill Horowitz; Marina Caskey; Mila Jankovic; Davide F Robbiani; Yumei Wen; Ype P de Jong; Charles M Rice; Michel C Nussenzweig	A Combination of Human Broadly Neutralizing Antibodies against Hepatitis B Virus HBsAg with Distinct Epitopes Suppresses Escape Mutations.	Cell Host Microbe	2020
1037271	32855110	Inna Tulaeva; Carolin Cornelius; Petra Ziegelmayer; René Ziegelmayer; René Schmutz; Patrick Lemell; Milena Weber; Margarete Focke-Tejkt; Alexander Karaulov; Rainer Henning; Rudolf Valenta	Quantification, epitope mapping and genotype cross-reactivity of hepatitis B preS-specific antibodies in subjects vaccinated with different dosage regimens of BM32.	EBioMedicine	2020
1035521	30771531	M-W Lai; K-H Liang; C-T Yeh	Diverse immune responses to HBV surface epitope variants after vaccine booster in adolescents immunized in infancy.	Clin Microbiol Infect	2019
1033695	29847243	Chang-Yu Chang; Fu-Ling Chang; Chen-Wei Chiang; Yan-Ni Lo; Tsai-Yu Lin; Wang-Chuan Chen; Keng-Chang Tsai; Yu-Ching Lee	Interaction of S17 Antibody with the Functional Binding Region of the Hepatitis B Virus Pre-S2 Epitope.	Viral Immunol	2018
1032281	28949917	Dan Li; Wenhui He; Ximing Liu; Sanduo Zheng; Yonghe Qi; Huiyu Li; Fengfeng Mao; Juan Liu; Yinyan Sun; Lijing Pan; Kaixin Du; Keqiong Ye; Wenhui Li; Jianhua Sui	A potent human neutralizing antibody Fc-dependently reduces established HBV infections.	Elife	2017
1025661	23452727	Zhongji Meng; Ruihua Song; Yue Chen; Yang Zhu; Yanhui Tian; Ding Li; Daxiang Cui	Rapid screening and identification of dominant B cell epitopes of HBV surface antigen by quantum dot-based fluorescence polarization assay.	Nanoscale Res Lett	2013
1025788	23597076	Jessica Z Bereszczak; Rebecca J Rose; Esther van Duijn; Norman R Watts; Paul T Wingfield; Alasdair C Steven; Albert J R Heck	Epitope-distal effects accompany the binding of two distinct antibodies to hepatitis B virus capsids.	J Am Chem Soc	2013
1019757	20412816	Kazuto Tajiri; Tatsuhiko Ozawa; Aishun Jin; Yoshiharu Tokimitsu; Masami Minemura; Hiroyuki Kishii; Toshiro Suwama; Atsushi Murauchi	Analysis of the epitope and neutralizing capacity of human monoclonal antibodies induced by hepatitis B vaccine.	Antiviral Res	2010




# Example Query II: Influenza Virus Epitopes


**START YOUR SEARCH HERE ?**

**Epitope ?** 


Any  
 Linear peptide  
Exact N   
 Discontinuous  
 Non-peptidic

**Assay ?** 


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

**Epitope Source ?** 


Organism  
  <sup>1</sup>  
Antigen  
Ex: core, capsid, myosin

**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: All influenza virus epitopes

*Both positive and negative assay outcomes*

Pending Filters

Reset Search

Filter Options ?

Default

Epitope ?

Any

Linear peptide

Length

Sequence

Discontinuous

Non-peptidic

3D structure available

Amino acid modification

Epitope Source ?

Organism

Influenza virus (ID:100020) 1

Antigen

Ex: core, capsid, myosin

Include related structure

Select multiple options

Receptor ?

Current Filters:  Organism: Influenza virus (ID:10002045)  Include Positive Assays  Include Negative Assays

Epitopes (9202)		Antigens (30)		Assays (35391)		Receptors (15391)		References (1604)	
9202 Records Found									
Go To Records Starting At 1200 <input type="button" value="Go"/>									
Page 1 of 369									
Details	Epitope	Antigen	Organism	# References	# Assays				
20354	GILGFVFTL	Matrix protein 1	Influenza A virus	253	675				
4602	ASNENMETM	Nucleoprotein	Influenza A virus	159	467				
48237	PKYVKQNTLKLAT	Hemagglutinin	Influenza A virus	131	482				
61151	SSLENFRAYV	Polymerase basic protein 2	Influenza A virus	92	287				
67436	TYQRTRALV	Nucleoprotein	Influenza A virus	87	207				
60867	SRYWAIRTR	Nucleoprotein	Influenza A virus	57	146				
7136	CTELKLSDY	Nucleoprotein	Influenza A virus	39	88				
4578	ASNENMDAM	Nucleoprotein	Influenza A virus	33	98				
57751	SFERFEIFPKE	Hemagglutinin	Influenza A virus	33	127				
13263	ELRSRYWAI	Nucleoprotein	Influenza A virus	32	80				
59318	SLLTEVETPIRNEWGRCNDSSD	Matrix protein 2	Influenza A virus	32	148				
61497	SSYRRPVGI	RNA-directed RNA polymerase catalytic subunit	Influenza A virus	31	78				
29690	IYSTVASSL	Hemagglutinin	Influenza A virus	30	106				
27283	ILRGSVAHK	Nucleoprotein	Influenza A virus	29	57				
70898	VSDGGPNLY	RNA-directed RNA polymerase catalytic subunit	Influenza A virus	29	55				
56055	RTFSFQLI	Nuclear export protein	Influenza A virus	27	63				
17119	FMYSDFHFI	Polymerase acidic protein	Influenza A virus	25	67				
39494	LSLRNPILV	Protein PB1-F2	Influenza A virus	24	52				
57322	SDYEGRLI	Nucleoprotein	Influenza A virus	19	43				
2014	AIMDKNIIL	Nuclear export protein	Influenza A virus	18	79				

# Results: Positive influenza virus epitopes

## Positive assay outcomes

Pending Filters

Reset Search

Filter Options (?)

Default

Epitope (?)

Any

Linear peptide

Length

Sequence

Discontinuous

Non-peptidic

3D structure available

Amino acid modification

Epitope Source (?)

Organism

Influenza virus (ID:100020) (1)

Antigen

Ex: core, capsid, myosin

Include related structure

Select multiple options

Receptor (?)

Current Filters:  Organism: Influenza virus (ID:10002045)  Include Positive Assays

Epitopes (5225) Antigens (30) Assays (20936) Receptors (15391) References (1564)

Go To Records Starting At 1200 Go

Export Results

5225 Records Found

Page 1 of 209

25 Per Page

Details	Epitope	Antigen	Organism	# References	# Assays
20354	GILGFVFTL	Matrix protein 1	Influenza A virus	247	637
4602	ASNENMETM	Nucleoprotein	Influenza A virus	154	429
48237	PKYVKQNTLKLAT	Hemagglutinin	Influenza A virus	124	418
61151	SSELENFRAYV	Polymerase basic protein 2	Influenza A virus	92	270
67436	TYQRTRALV	Nucleoprotein	Influenza A virus	84	180
60867	SRYWAIRTR	Nucleoprotein	Influenza A virus	46	101
7136	CTELKLSDY	Nucleoprotein	Influenza A virus	35	62
57751	SFERFEIFPKE	Hemagglutinin	Influenza A virus	33	115
59318	SLLTEVETPIRNEWGRCNDSSD	Matrix protein 2	Influenza A virus	32	133
4578	ASNENMDAM	Nucleoprotein	Influenza A virus	31	75
61497	SSYRRPVGI	RNA-directed RNA polymerase catalytic subunit	Influenza A virus	29	69
29690	IYSTVASSL	Hemagglutinin	Influenza A virus	28	95
13263	ELRSRYWAI	Nucleoprotein	Influenza A virus	27	50
27283	ILRGSVAHK	Nucleoprotein	Influenza A virus	25	49
56055	RTFSFQLI	Nuclear export protein	Influenza A virus	25	52
70898	VSDGGPNLY	RNA-directed RNA polymerase catalytic subunit	Influenza A virus	25	36
17119	FMYSDFHFI	Polymerase acidic protein	Influenza A virus	21	58
39494	LSLRNPILV	Protein PB1-F2	Influenza A virus	21	45
2014	AIMDKNIL	Nuclear export protein	Influenza A virus	17	72
57322	SDYEGRLI	Nucleoprotein	Influenza A virus	17	34

# Results: Influenza virus epitopes that bind

## Positive assay outcomes for MHC assays

Pending Filters

Reset Search

Filter Options ?

MHC

Epitope ?

Any

Linear peptide

Length

Sequence

Discontinuous

Non-peptidic

3D structure available

Amino acid modification

Epitope Source ?

Organism

Influenza virus (ID:100020) 1

Antigen

Ex: core, capsid, myosin

Include related structure

Select multiple options

MHC Assay ?

Current Filters:  Organism: Influenza virus (ID:10002045)  Include Positive Assays  No T cell assays  No B cell assays

Epitopes (2239) Antigens (25) Assays (5680) Receptors (0) References (422)

Go To Records Starting At 1200 GO

Export Results

2239 Records Found

Page 1 of 90

Details	Epitope	Antigen	Organism	# References	# Assays
48237	PKYVKQNTLKLAT	Hemagglutinin	Influenza A virus	84	270
20354	GILGFVFTL	Matrix protein 1	Influenza A virus	79	104
4602	ASNENMETM	Nucleoprotein	Influenza A virus	44	53
60867	SRYWAIRTR	Nucleoprotein	Influenza A virus	20	34
67436	TYQRTRALV	Nucleoprotein	Influenza A virus	18	20
7136	CTELKLSDY	Nucleoprotein	Influenza A virus	13	18
16681	FLKDVMESE	RNA-directed RNA polymerase catalytic subunit	Influenza A virus	12	17
61151	SSELENFRAYV	Polymerase acidic protein	Influenza A virus	12	21
70898	VSDGGPNLY	RNA-directed RNA polymerase catalytic subunit	Influenza A virus	12	18
54593	RLIQNSLTI	Nucleoprotein	Influenza A virus	11	18
17119	FMYSDFHFI	Polymerase acidic protein	Influenza A virus	10	22
18274	FVRQCFNPM	Polymerase acidic protein	Influenza A virus	10	18
13263	ELRSRYWAI	Nucleoprotein	Influenza A virus	9	13
24819	HSNLNDATY	Nucleoprotein	Influenza A virus	9	14
42612	MSNEGSYFF	Nucleoprotein	Influenza A virus	9	15
45001	NMLSTVLGV	RNA-directed RNA polymerase catalytic subunit	Influenza A virus	9	21
65229	TMLYINKMEF	Polymerase basic protein 2	Influenza A virus	9	17
72836	WMACHSAAF	Nucleoprotein	Influenza A virus	9	18
4578	ASNENMDAM	Nucleoprotein	Influenza A virus	8	9
41360	MEFEFPQSL	Polymerase basic protein 2	Influenza A virus	8	16

# Results: Influenza virus epitopes that are immunogenic

*Positive assay outcomes for T cell assays*

IMMUNE EPITOPE DATABASE AND ANALYSIS RESOURCE

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Pending Filters: **Organism: Influenza virus (ID:10002045)** **Include Positive Assays** **No B cell assays** **No MHC assays**

Epitopes (2262) | Antigens (17) | Assays (7593) | Receptors (15280) | References (877)

Go To Records Starting At 1200  Export Results

2262 Records Found Page 1 of 91

Details	Epitope	Antigen	Organism	# References	# Assays
20354	GILGFVFTL	Matrix protein 1	Influenza A virus	194	528
4602	ASNENMETM	Nucleoprotein	Influenza A virus	130	376
61151	SSLENFRAYV	Polymerase basic protein 2	Influenza A virus	88	249
67436	TYQRTRALV	Nucleoprotein	Influenza A virus	75	158
48237	PKYVKQNTLKLAT	Hemagglutinin	Influenza A virus	57	148
57751	SFERFEIFPKE	Hemagglutinin	Influenza A virus	33	107
60867	SRYWAIRTR	Nucleoprotein	Influenza A virus	32	67
4578	ASNENMDAM	Nucleoprotein	Influenza A virus	28	66
7136	CTELKLSDY	Nucleoprotein	Influenza A virus	27	44
29690	IYSTVASSL	Hemagglutinin	Influenza A virus	26	86
61497	SSYRRPVGI	RNA-directed RNA polymerase catalytic subunit	Influenza A virus	26	60
27283	ILRGSVAHK	Nucleoprotein	Influenza A virus	24	46
56055	RTFSFQLI	Nuclear export protein	Influenza A virus	23	41
13263	ELRSRYWAI	Nucleoprotein	Influenza A virus	20	37
39494	LSLRNPILV	Protein PB1-F2	Influenza A virus	20	37
70898	VSDGGPNLY	RNA-directed RNA polymerase catalytic subunit	Influenza A virus	16	18
2014	AIMDKNIIL	Non-structural protein 1	Influenza A virus	15	60
17119	FMYSDFHFI	Polymerase acidic protein	Influenza A virus	15	36
57322	SDYEGRLI	Nucleoprotein	Influenza A virus	15	28
52824	QVYSLIRPNENPAHK	Nucleoprotein	Influenza A virus	11	27

**Filter Options**

T Cell

**Epitope**

Any

Linear peptide

Length

Sequence

Discontinuous

Non-peptidic

3D structure available

Amino acid modification

**Epitope Source**

Organism

Influenza virus (ID:10002045)

Antigen

Ex: core, capsid, myosin

Include related structure

Select multiple options

**TCR**

# Results: Influenza virus mouse epitopes that are immunogenic

*Positive assay outcomes for T cell assays in a mouse host*

IMMUNE EPITOPE DATABASE AND ANALYSIS RESOURCE

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Pending Filters

Reset Search

Filter Options [?](#)

T Cell

Epitope [?](#)

Any

Linear peptide

Length

Sequence

Discontinuous

Non-peptidic

3D structure available

Amino acid modification

Epitope Source [?](#)

Organism

Influenza virus (ID:100020) [1](#)

Antigen

Ex: core, capsid, myosin

Include related structure

Select multiple options

TCR [?](#)

Current Filters:  Organism: Influenza virus (ID:10002045)  Include Positive Assays  No B cell assays  No MHC assays  Host: Mus (mice)

Epitopes (958) Antigens (15) Assays (3865) Receptors (1909) References (518)

Go To Records Starting At 1200 [GO](#) Export Results [?](#)

958 Records Found Page 1 of 39 Per Page 25

Details	Epitope	Antigen	Organism	# References	# Assays
4602	ASNENMETM	Nucleoprotein	Influenza A virus	130	376
61151	SSLENFRAYV	Polymerase acidic protein	Influenza A virus	88	249
67436	TYQRTRALV	Nucleoprotein	Influenza A virus	75	158
57751	SFERFEIFPKE	Hemagglutinin	Influenza A virus	32	105
4578	ASNENMDAM	Nucleoprotein	Influenza A virus	28	66
29690	IYSTVASSL	Hemagglutinin	Influenza A virus	26	86
61497	SSYRRPVGI	RNA-directed RNA polymerase catalytic subunit	Influenza A virus	26	60
20354	GILGFVFTL	Matrix protein 1	Influenza A virus	25	74
56055	RTFSFQLI	Nuclear export protein	Influenza A virus	23	41
39494	LSLRNPILV	Protein PB1-F2	Influenza A virus	20	37
57322	SDYEGRLI	Nucleoprotein	Influenza A virus	15	28
48237	PKYVKQNTLKLAT	Hemagglutinin	Influenza A virus	13	20
52824	QVYSLRPNENPAHK	Nucleoprotein	Influenza A virus	11	27
41602	MGLIYNRM	Matrix protein 1	Influenza A virus	10	19
59318	SLLTEVETPIRNEWGCRCDSSD	Matrix protein 2	Influenza A virus	10	23
129797	RNLLWLTGKNGLYPNLS	Hemagglutinin	Influenza A virus	10	15
17119	FMYSDFHFI	Polymerase acidic protein	Influenza A virus	9	21
18406	FYIQMCTEL	Nucleoprotein	Influenza A virus	9	22
24408	HNTNGVTAACSHE	Hemagglutinin	Influenza A virus	9	16
67437	TYQRTRALVRTG	Nucleoprotein	Influenza A virus	9	16

# Results: Influenza virus epitopes that offer protection from disease

*Positive assay outcomes for T cell assays (decreased disease, adoptive transfer, challenge) in a mouse host*

The screenshot displays the IEDB Assay Finder interface. The top section shows a table with columns for Details, Epitope, Antigen, Organism, # References, and # Assays. The table lists two epitopes: 20354 (GILGFVFTL) and 4602 (ASNENMETM), both associated with Influenza A virus antigens (Matrix protein 1 and Nucleoprotein).

The main interface is the 'ASSAY FINDER' window. It features a 'Current Selection(s)' bar with filters for 'decreased disease', 'adoptive transfer', and 'challenge'. Below this is a 'Search By' section with fields for Name (Example: IL-2, Release), Method/Technique, Measurement Of, and Units, along with a 'Search' button. To the right is a 'Browse by Tree (Click to Select)' section showing a hierarchical tree of assay types. The tree is expanded to show 'T cell assay' and its sub-categories. The following categories are highlighted in yellow, indicating they are selected: 'decreased disease', 'disease exacerbation', 'adoptive transfer', 'in vivo proliferation', and 'challenge'. Other categories include '3D structure', 'binding constant', 'biological activity', 'activation', 'cytokine release', 'cytotoxicity', 'degranulation', 'helper response', 'in vivo activity', 'tolerance', 'type IV hypersensitivity (DTH)', 'proliferation', 'suppression', and 'qualitative binding'.

On the left side of the interface, there are several filter panels: 'Epitope' (Any, Linear peptide, Length, Sequence, Discontinuous, Non-peptidic), 'Epitope Source' (Organism: Influenza virus (ID:100020), Antigen: Ex: core, capsid, myosin), 'TCR' (Has TCR sequence, Type: Any Type, Paired chains only), and 'T Cell Assay' (Outcome: Positive, Any, Cytokine production, MHC multimer, In vivo, Ex: IL-2 release).

At the bottom right, there is a 'Per Page' dropdown set to 25 and an 'Export Results' button.

# Results: Influenza virus epitopes that offer protection from disease

Positive assay outcomes for T cell assays (decreased disease, adoptive transfer, challenge) in a mouse host

Pending Filters

Reset Search

Filter Options

T Cell

Epitope

Any

Linear peptide

Length

Sequence

Discontinuous

Non-peptidic

3D structure available

Amino acid modification

Epitope Source

Organism

Influenza virus (ID:100020)

Antigen

Ex: core, capsid, myosin

Include related structure

Select multiple options

TCR

Has TCR sequence

Type

Any Type

Paired chains only

Chain

Any Type

Sequence

Exact Matches

T Cell Assay

Outcome

Positive

Current Filters: **Organism: Influenza virus (ID:10002045)** **Include Positive Assays** **No B cell assays** **No MHC assays** **Host: Mus (mice)** **T Cell Assays: decreased disease, adoptive transfer, challenge**

Epitopes (43) Antigens (9) Assays (97) Receptors (38) References (51)

Go To Records Starting At 1200

43 Records Found

Page 1 of 2

Details	Epitope	Antigen	Organism	# References	# Assays
	57751	SFERFEIFPKE	Hemagglutinin	Influenza A virus	8 12
	67436	TYQRTRALV	Nucleoprotein	Influenza A virus	8 11
	20354	GILGFVFTL	Matrix protein 1	Influenza A virus	7 12
	29690	IYSTVASSL	Hemagglutinin	Influenza A virus	7 8
	4602	ASNENMETM	Nucleoprotein	Influenza A virus	5 5
	61151	SSLENFRAYV	Polymerase acidic protein	Influenza A virus	4 4
	59318	SLLTEVETPIRNEWGCRNDSSD	Matrix protein 2	Influenza A virus	3 3
	17119	FMYSDFHFI	Polymerase acidic protein	Influenza A virus	2 2
	2014	AIMDKNIL	Non-structural protein 1	Influenza A virus	1 1
	2790	ALNNRFQIKGVELKS	Hemagglutinin	Influenza A virus	1 2
	4578	ASNENMDAM	Nucleoprotein	Influenza A virus	1 1
	5757	AYERMCNIL	Nucleoprotein	Influenza A virus	1 1
	16098	FHDSNVKNL	Hemagglutinin	Influenza A virus	1 1
	18406	FYIQMCTEL	Nucleoprotein	Influenza A virus	1 1
	19421	GERQNATEI	Nucleoprotein	Influenza A virus	1 1
	23311	GVAQTDCVL	RNA-directed RNA polymerase catalytic subunit	Influenza A virus	1 1
	41602	MGLYVIRM	Matrix protein 1	Influenza A virus	1 1
	42596	MSLLTEVETPIRNEWGCRNDSSD	Matrix protein 2	Influenza A virus	1 1
	48650	PNGYIEGK	Polymerase basic protein 2	Influenza A virus	1 1
	54593	RLIQNSLTI	Nucleoprotein	Influenza A virus	1 1
	54594	RLIQNSLTIERMVLS	Nucleoprotein	Influenza A virus	1 1
	56055	RTFSFOLI	Nuclear export protein	Influenza A virus	1 1
	61497	SSYRRPVGI	RNA-directed RNA polymerase catalytic subunit	Influenza A virus	1 1
	62335	SVSSFERFEIFPK	Hemagglutinin	Influenza A virus	1 1
	67391	TYNAELLVL	Hemagglutinin	Influenza A virus	1 1

43 Records Found

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Go To Records Starting At 1200



# More Exports



See our latest homology analysis of SARS-CoV-2 spike sequences to myocarditis-associated antigens [here](#).

## Welcome

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\* register [here](#)

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## Summary Metrics

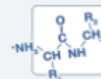
Peptidic Epitopes	1,141,280
Non-Peptidic Epitopes	3,123
T Cell Assays	417,230
B Cell Assays	1,146,404
MHC Ligand Assays	3,235,984
Epitope Source Organisms	4,079
Restricting MHC Alleles	941
References	22,374

## START YOUR SEARCH HERE

### Epitope

- Any  
 Linear peptide  
 Discontinuous  
 Non-peptidic

Exact IV



### Assay

- T Cell  
 B Cell  
 MHC Ligand

Ex: neutralization

Outcome:  Positive  Negative



### Epitope Source

Organism

Ex: influenza, peanut

Antigen

Ex: core, capsid, myosin



### 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



Reset

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## Epitope Analysis

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Scan an antigen sequence for amino acid patterns indicative of:

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MHC II Binding

MHC I Processing (Proteasome, TAP)

MHC I Immunogenicity

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ElliPro

### Epitope Analysis Tools

Analyze epitope sets of:

Population Coverage

Conservation Across Antigens

Clusters with Similar Sequences

# More Exports

[http://www.iedb.org/database\\_export\\_v3](http://www.iedb.org/database_export_v3)

XML Database Export	
<a href="#">Complete Database Export</a>	323MB
<a href="#">iedbAccessionList.zip</a>	49kB
<a href="#">MhcAlleleNameList.zip</a>	34kB
<a href="#">OrganismList.zip</a>	35MB
<a href="#">AssayTypeList.zip</a>	5kB
<a href="#">GeoLocList.zip</a>	3kB

IEDB Schema	
<a href="#">Curation.xsd (Primary IEDB schema)</a>	48kB
<a href="#">CurationSimpleTypes.xsd</a>	303kB
<a href="#">iedbAccessionList.xsd</a>	909B
<a href="#">MhcAlleleNameList.xsd</a>	1kB
<a href="#">OrganismList.xsd</a>	751B
<a href="#">AssayTypeList.xsd</a>	771B
<a href="#">GeoLocList.xsd</a>	642B

MySQL Database Export	
<a href="#">SQL Statement Export</a>	379MB
<a href="#">MyISAM Binary Export</a>	819MB

Physical Entity Relationship Diagram	
<a href="#">iedb_public_erd.pdf</a>	31kB

CSV Metric Exports	
<a href="#">epitope_full_v3.zip</a>	65MB
<a href="#">antigen_full_v3.zip</a>	2MB
<a href="#">tcell_full_v3.zip</a>	28MB
<a href="#">bcell_full_v3.zip</a>	36MB
<a href="#">mhc_ligand_full (single_file.zip) (multi_file.zip)</a>	168MB
<a href="#">reference_full_v3.zip</a>	12MB
<a href="#">receptor_full_v3.zip</a>	5MB
<a href="#">iedb_3d_full.zip</a>	3MB

Stable ID Exports	
<a href="#">Linkout IDs Compact</a>	21MB
<a href="#">Linkout IDs Full</a>	40MB
<a href="#">ChEBI to Epitope ID Maps</a>	158kB
<a href="#">PDB to Epitope ID Maps</a>	51kB
<a href="#">Epitope ID to Linear Seq Maps</a>	11MB

# Help integrated throughout the website



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**Epitope ?** Filter epitopes by molecular structure. [Learn More](#)

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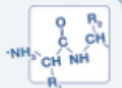
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# Solution Center: help.iedb.org

Accessible through header and footer on every page or submit via email to [help@iedb.org](mailto:help@iedb.org)

The screenshot shows the IEDB Solutions Center Forum homepage. At the top, there is a search bar with a magnifying glass icon and the text "Search". Below the search bar is the main heading "IEDB Solutions Center Forum". Underneath, there are three main categories: "IEDB Publications" (described as IEDB-related publications authored by members of the IEDB team), "General", and "Future features" (described as possible new features or enhancements to existing ones derived from user help requests). Below these categories is a section titled "Promoted articles" which lists several articles in a grid format, including "Comprehensive Review of Human Plasmodium falciparum-Specific CD8+ T Cell Epitopes (2019)", "Citing the IEDB", "Getting Started", "IEDB Annual Compendium for 2018", "2019 User Workshop", "IEDB FAIRness", "IEDB Outreach Events for 2019", "IEDB Analysis Resource v2.21 release notes (26 Mar 2019)", "IEDB v3.10.0 release notes", "IEDB v3.10.0 release notes", "IEDB v3.6.0 Release Notes (16 December 2016)", "IEDB 3.3 Release Notes (5 February 2016)", "IEDB User Documentation Release 3", "User Workshop Webcasts", and "A New Format for the Details Pages".

The screenshot shows the "Submit a request" form in the IEDB Solutions Center. At the top right, there are links for "Submit a request" and "Sign in". Below the navigation is a search bar with a magnifying glass icon and the text "Search". The main heading is "Submit a request". The form contains several fields: "Your email address\*" (with a text input field), "Subject\*" (with a text input field), and "Description\*" (with a large text area). Below the description field, there is a note: "Please enter the details of your request. A member of our support staff will respond as soon as possible." Underneath this note is an "Attachments" section with a text input field and a button labeled "Add file or drop files here". At the bottom of the form is a blue "Submit" button.