



Welcome to the

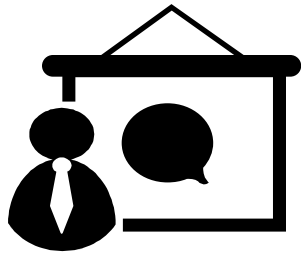
2023 IEDB Virtual User Workshop

Day 2

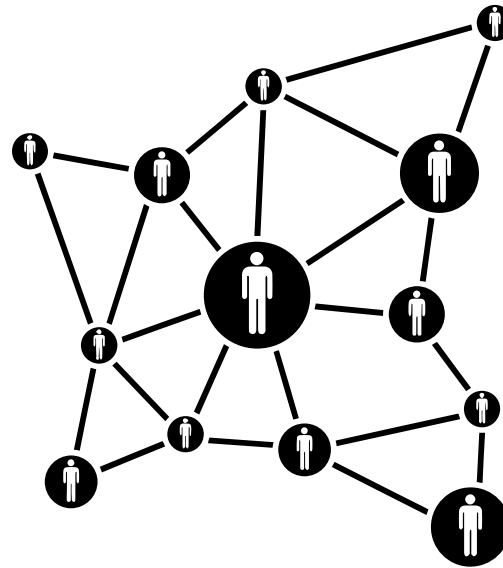
Thursday, November 2, 2023

Annual IEDB User Workshop – Why?

3 Day Event



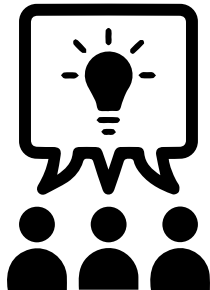
IEDB and tools overview with research examples and specialized topics



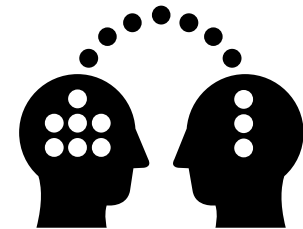
Engage with global user community



Answer user questions to facilitate learning



Improve our resources through user feedback



Share ideas to further scientific research

User Workshop Structure

Day 1

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

Ex: influenza, peanut

Antigen

Ex: core, capsid, myo

Host

Any

Human

Mouse

Non-human primate

Ex: dog, camel

MHC Restriction

Any

Class I

Class II

Non-classical

Ex: HLA-A*02:01

Disease

Any

Infectious

Allergic

Autoimmune

Ex: asthma

Process Overview and Database

Day 2

IEDB Analysis Resource

[Overview](#) [T Cell Tools](#) [B Cell Tools](#) [Analysis Tools](#) [Tools-API](#) [Usage](#) [Download](#) [Data](#)

Epitope Prediction and Analysis Tools

Welcome to the Immune Epitope Database Analysis Resource. This site provides a collection of tools for the prediction and analysis of immune epitopes. It serves as a companion site to the [Immune Epitope Database \(IEDB\)](#), a manually curated database of experimentally characterized immune epitopes.

The tools contained fall into the following categories:

T Cell Epitope Prediction Tools

This set of tools includes MHC class I & II binding predictions, as well as peptide processing predictions and immunogenicity predictions.

B Cell Epitope Prediction Tools

The tools here are intended to predict regions of proteins that are likely to be recognized as epitopes in the context of a B cell response.

The screenshot shows the IEDB Analysis Resource website. At the top, there is a navigation bar with links for Overview, T Cell Tools, B Cell Tools, Analysis Tools, Tools-API, Usage, Download, and Data. Below this is a section titled "Epitope Prediction and Analysis Tools" with a welcome message and a list of tool categories. The main content area displays the "T Cell Prediction - Class I" tool interface. It includes a header "MHC class I binding affinity, TAP processing, and immunogenicity predictions" and a text input field for a sequence. Below the input field, there is a dropdown menu for "MHC Alleles" with "Ex: HLA-A*02:01" selected. A "Find" button is visible to the right of the input field. The page also features a sidebar with "Announcements" and "Appearances & Events" sections.

Next-Generation Tools & Analysis Resource

Day 3



CEDAR
Cancer Epitope Database and Analysis Resource

Los Alamos
NATIONAL LABORATORY

Specialized Topics – 3D Structures, Cancer, HIV

Who You'll Hear From



Dr. Jason Greenbaum
Bioinformatics Core Director



Dr. Bjoern Peters
Co-Principal Investigator



Dr. Eve Richardson
*Bioinformatics Postdoctoral
Researcher*

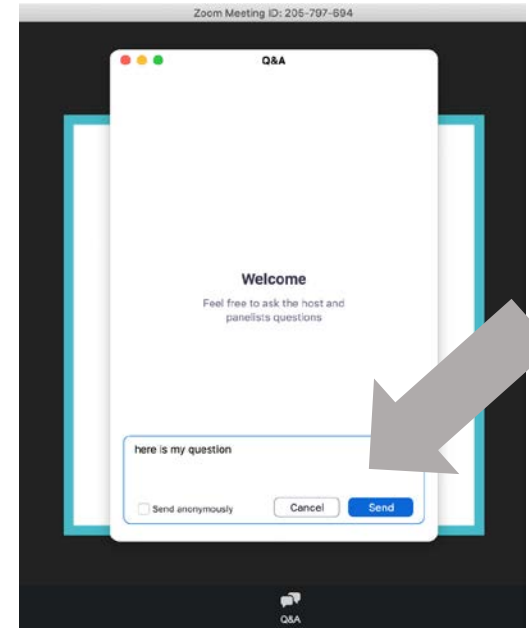
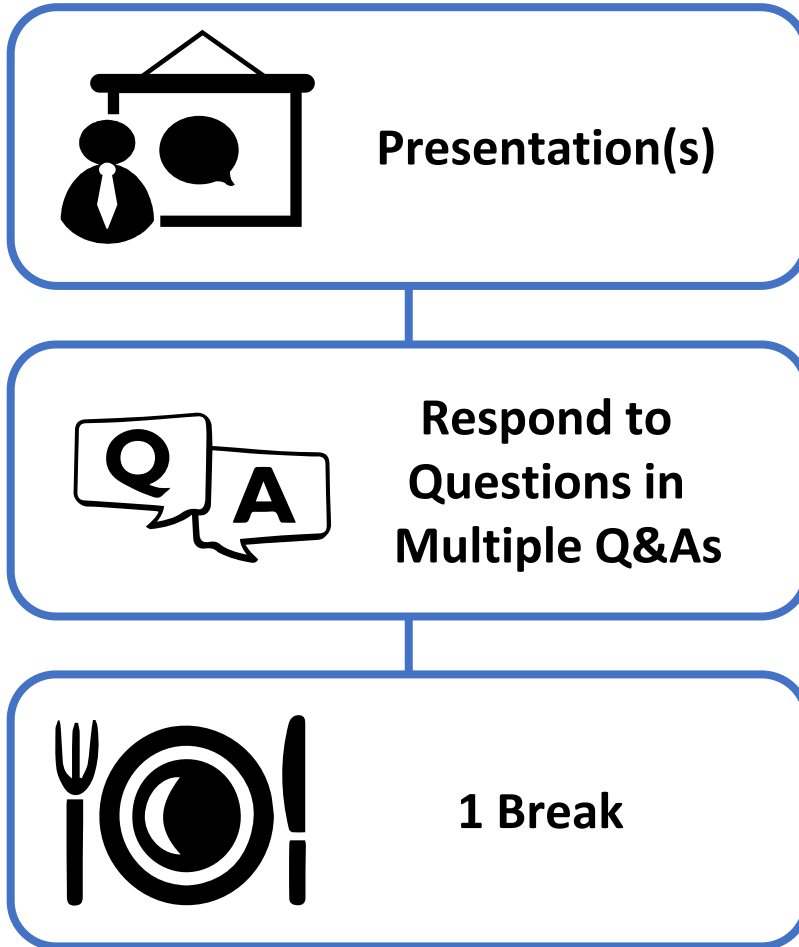


Dr. Raphael Trevizani
*Bioinformatics Postdoctoral
Researcher*

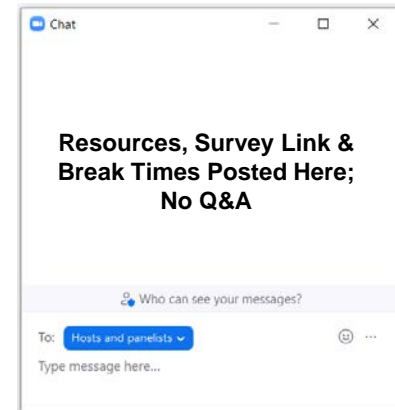


Dr. Mahita Jarjapu
*Bioinformatics Postdoctoral
Researcher*

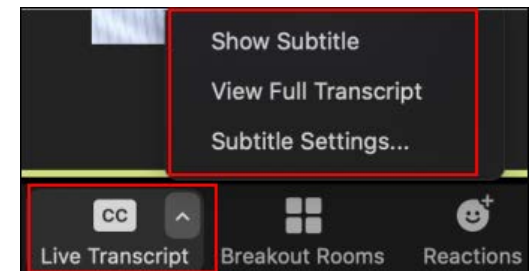
User Workshop Structure



Q&A



Chat



Subtitles

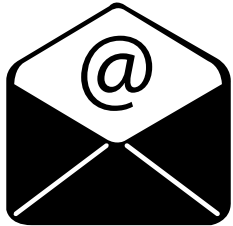
Agenda – Day 2

Start Time	End Time	Topic	Speaker
08:00	08:15	Welcome & Analysis Resource Overview	Nina Blazeska <i>IEDB Senior Project Manager</i>
08:15	08:30	IEDB Next-Generation Tools Introduction	Jason Greenbaum <i>Bioinformatics Core Director</i>
08:30	09:00	T Cell Class I Tools (Binding, Processing, Immunogenicity)	Jason Greenbaum <i>Bioinformatics Core Director</i>
09:00	09:15	Next Generation Tool Pipelines - Cluster & PEPMatch	Bjoern Peters <i>IEDB Co-Principal Investigator</i>
09:15	10:00	T Cell Class II Tools (Binding, Processing, Immunogenicity)	Bjoern Peters <i>IEDB Co-Principal Investigator</i>
10:00	10:20	<u>Section 1</u> : Q&A with Drs. Greenbaum and Peters	
10:20	10:35	Break	

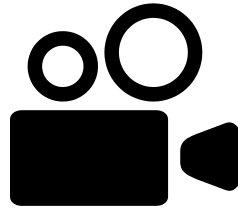
Agenda – Day 2

Start Time	End Time	Topic	Speaker
10:35	11:05	B Cell Epitope Prediction	Eve Richardson <i>Bioinformatics Postdoctoral Researcher</i>
11:05	11:35	Receptor Tools - TCRMatch	Raphael Trevizani <i>Bioinformatics Postdoctoral Researcher</i> Mahita Jarjapu <i>Bioinformatics Postdoctoral Researcher</i>
11:35	11:50	<u>Section 2</u> : Q&A with Drs. Richardson, Trevizani and Jarjapu	
11:50	12:00	Closing Remarks & Feedback Survey	Nina Blazeska <i>IEDB Senior Project Manager</i>
	12:00	End of Session	

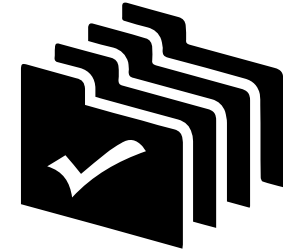
Other Event Logistics



You will receive a post-event email next week



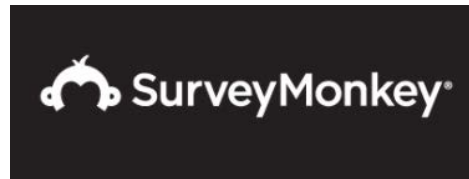
Workshop recording will be shared with you



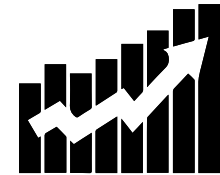
All presentations will be shared with you



Participation certificates will be provided upon request



Daily and post-event feedback survey



Be aware of IEDB slowness due to increased traffic



#iedbuw2023

Follow us @iedb_



Brief Tools Overview

tools.iedb.org
nextgen-tools.iedb.org

IEDB Tools

Analysis Resource & Next-Generation Tools

Epitope Prediction and Analysis Tools

Welcome to the Immune Epitope Database Analysis Resource. This site provides a collection of tools for the prediction and analysis of immune epitopes. It serves as a companion site to the [Immune Epitope Database \(IEDB\)](#), a manually curated database of experimentally characterized immune epitopes.

The tools contained fall into the following categories:

T Cell Epitope Prediction Tools

This set of tools includes MHC class I & II binding predictions, as well as peptide processing predictions and immunogenicity predictions.

B Cell Epitope Prediction Tools

The tools here are intended to predict regions of proteins that are likely to be recognized as epitopes in the context of a B cell response.

Analysis Tools

The epitope analysis tools are intended for the detailed analysis of a known epitope sequence or group of sequences.

Analysis Resource:

- T cell epitope prediction
- B cell epitope prediction
- Analysis tools

tools.iedb.org

Welcome to the Next-Generation IEDB Tools site!

As a companion site to the Immune Epitope Database (IEDB), this site provides a collection of tools for the prediction and analysis of immune epitopes.

New User? Learn to use the website here!

T Cell Prediction - Class I

MHC class I binding affinity, TAP processing, and Immunogenicity predictions

Type/paste/drag a sequence into this box or click 'Run' to use the example sequence:

>SARS2 spike glycoprotein

MFVFLVLLPLVSSQCVNLTTRTQLPPAYTNSFTRGVVYYPDKVFRSSVLHSTQDLFLPFFSNVTWF

HAIHVSNGTNGTKRFDNPNVLPFNDGVYFASTEKSNIIIRGWIFGTLLDSKTQSLIVNINATNVVIVK

CEFQFCNDPFLGVVYHKNKSWMESEFRVYSSANNCTFEYVSQPFLMDLEGKQGNFKNLREF

MHC
Allele(s)

Ex: HLA-A*02:01

0



Next-Generation Tools:

- Re-implementing existing tools with a focus on improving usability and function
- Launched in 2023
- More tools to be added

nextgen-tools.iedb.org

Accessing the Analysis Resource



A screenshot of the IEDB website home page. The address bar shows `iedb.org`, highlighted with a red box. The navigation menu includes "Home", "Specialized Searches", and "Analysis Resource", with the latter highlighted by a red box. A red-bordered box on the right side of the page highlights the "Epitope Analysis Resource" section, which contains links for "T Cell Epitope Prediction", "B Cell Epitope Prediction", and "Epitope Analysis Tools".

Epitope Prediction and Analysis

Welcome to the Immune Epitope Database Analysis Resource. It provides a collection of tools for the prediction and analysis of epitopes. It serves as a companion site to the Immune Epitope Database (IEDB), a manually curated database of experimentally determined immune epitopes.

The tools contained fall into the following categories:

- T Cell Epitope Prediction Tools**
This set of tools includes MHC class I & II binding peptide processing predictions and immunogenicity predictions.
- B Cell Epitope Prediction Tools**
The tools here are intended to predict regions of an antigen that can be recognized as epitopes in the context of a B cell.
- Analysis Tools**
The epitope analysis tools are intended for the analysis of an epitope sequence or group of sequences.

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 and other animal species in the context of infectious disease, allergy, autoimmunity and transplantation. The IEDB also hosts epitope prediction and analysis tools, and has a companion site, CEDAR (funded by NCI), which houses cancer epitopes.

START YOUR SEARCH HERE

Epitope

- Any
- Linear peptide
- Discontinuous
- Non-peptidic

Exact Match:

Assay

- T Cell
- B Cell
- MHC Ligand

Ex: neutralization

Outcome: Positive Negative

Epitope Source

Organism:

Antigen:

Host

- Any
- Human
- Mouse
- Non-human primate

Ex: dog, camel

MHC Restriction

- Any
- Class I
- Class II
- Non-classical

Ex: HLA-A*02:01

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

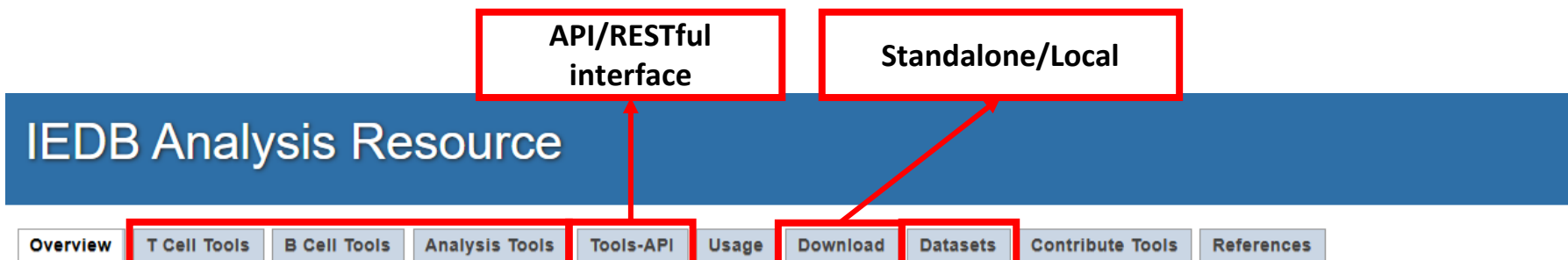
Analyze epitope sets of:

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

Summary Metrics

Metric	Count
Peptidic Epitopes	1,598,102
Non-Peptidic Epitopes	3,188
T Cell Assays	508,903
B Cell Assays	1,392,337
MHC Ligand Assays	4,778,051
Epitope Source Organisms	4,403
Restricting MHC Alleles	994
References	24,243

Available Resources



Epitope Prediction and Analysis Tools

Welcome to the Immune Epitope Database Analysis Resource. This site provides a collection of tools for the prediction and analysis of immune epitopes. It serves as a companion site to the [Immune Epitope Database \(IEDB\)](#), a manually curated database of experimentally characterized immune epitopes.

The tools contained fall into the following categories:

T Cell Epitope Prediction Tools

This set of tools includes MHC class I & II binding predictions, as well as peptide processing predictions and immunogenicity predictions.

B Cell Epitope Prediction Tools

The tools here are intended to predict regions of proteins that are likely to be recognized as epitopes in the context of a B cell response.

Analysis Tools

The epitope analysis tools are intended for the detailed analysis of a known epitope sequence or group of sequences.

IEDB-AR News

• We're Hiring

[Bioinformatician for the Immune Epitope Analysis Resource](#)

• Python 3 availability

As of 2 July 2020, all code has been ported to Python 3, including the standalone tools. Thanks for your patience and be sure to [inform us](#) of any issues that arise.

IEDB-AR Release Notes

[IEDB Analysis Resource v2.24 release notes \(1 Oct 2020\)](#)

2020-10-01
NEW: The IEDB-AR has been incorporated into mhcii binding prediction tool NetMHCIIpan-4.0 (F1 and F2)...

[IEDB Analysis Resource v2.23 release notes](#)

[IEDB Analysis Resource v2.22 release notes](#)

**Solutions Center:
Tutorials, Q&A**

help@iedb.org

[IEDB](#) [Help](#) [Contact](#)

This site is best viewed with current versions of [Mozilla Firefox](#) or [Google Chrome](#).

IEDB Analysis Resource

tools.iedb.org

T Cell Tools

MHC binding prediction

- MHC I binding prediction
- MHC II binding prediction
- TepiTool

MHC ligand prediction

- NetChop/NetCTL/NetCTLpan
- MHC-NP, MHCII-NP
- AXEL-F

Immunogenicity prediction

- CD4 & CD8 T cell immunogenicity prediction tools

Other

- Deimmunization tool
- TCRMatch
- Docktope

B Cell Tools

Linear epitope prediction

- BepiPred
- Other methods

Discontinuous epitope prediction

- DiscoTope
- ElliPro

Antibody and TCR structure prediction

- LYRA
- SCEptRe

Analysis Tools

Population coverage of epitope set

- Population coverage tool

Degree of conservation

- Conservancy analysis tool

Group peptides based on sequence identity

- Epitope cluster analysis

Infer restriction in HLA typed subjects

- RATE

Aggregate heterogeneous immune response

- ImmunomeBrowser

Other

- PepSySco
- PepX

Next-Generation Tools

<https://nextgen-tools.iedb.org/>



Tools ▾ Help & Info ▾

Announcements

Next-Generation IEDB Tools
site released to public

Appearances & Events

[Virtual User Workshop](#) Nov 1-3, 2023

* Register [Here](#)

AACR 2024 Apr 5-10, 2024

Festival of Biologics Apr 15-17, 2024

AAI 2024 May 3-7, 2024

Additional Resources

API

Downloads

Welcome to the Next-Generation IEDB Tools site!

As a companion site to the Immune Epitope Database (IEDB), this site provides a collection of tools for the prediction and analysis of immune epitopes.

New User? Learn to use the website here!

[T Cell Prediction - Class I](#)

MHC class I binding affinity, TAP processing, and Immunogenicity predictions

Type/paste/drag a sequence into this box or click 'Run' to use the example sequence:

>SARS2 spike glycoprotein

```
MFVFLVLLPLVSSQCVNLTRTQLPPAYTNSFTRGVVYPDKVFRSSVLHSTQDLFLPFFSNVTWFHAIHVSNGTKRFDNPVLPFNDGVYFAST  
EKSNIIRGWIFGTTLDSTKQSLIVNNAATNVVIKVFCEFCNDPFLGVVYHKNNKSWMESEFRVYSSANNCTFEYVVSQPFLMDLEGKQGNFKN  
LREFVFKNIDGYFKIYKHTPINLVRDLPQGFSALEPLVDLPIGINITRFQTLALHRSYLTGDSGSSGWTAGAAAYVGYLQPRTFLLKYNENGTIT
```

MHC Allele(s)

Ex: HLA-A*02:01

0



More tools coming soon.

Run example query from home page

Without further ado...



Dr. Jason Greenbaum
Bioinformatics Core Director

IEDB Next-Generation Tools Introduction