

## THE WIKIPEDIA OF VENOME Where it Started

- Researchers at OSU's Venome Biochemistry Lab (*Venome Lab*) needed a way to store, compare, analyze, and share their sequenced venom proteins.
- Last year's capstone team created a public-facing website to share articles and protein prediction models, with a database of over 400 proteins sequences which can be searched or filtered, and integration of visualization tools Mol\*, Foldseek, and TM-Align.

### Features

- This year, we focused on improving user experience and expanding features for website management.
- PDB Comparisons – The Protein Database is the largest database of proteins on the internet. We integrated the ability to find patterns between our and their proteins.
- User account creation – Users can create their own accounts, which are automatically added to our user database. We also added an "admin" type of accounts that can approve protein sequences uploaded by users.
- User-uploaded proteins – Users can upload proteins, which are added to the website and database if approved. Users can see who uploaded a protein, and each user has a collection of proteins they have uploaded.
- Articles – These articles give other users a chance to learn more about research being performed around the country at other labs.
- Search and Filter Expansion – We decided it would help users search through the large database if they had the ability to sort by different attributes and search based on atom count.
- AlphaFold3 – In May 2024, Google DeepMind's AlphaFold3 was released. In November, it became available for for community use. Our website now supports visual comparison and storage between AlphaFold2 and AlphaFold3 predictions.

### Where do we go from here?

- Future prepping our project is our big goal for now. Another team will likely be taking on this project next year, so we want to make sure they have as many resources as possible.



# THE UNKNOWN VENOME

## A Website to Connect Biochemists Across the Country, Designed for Research and Sharing

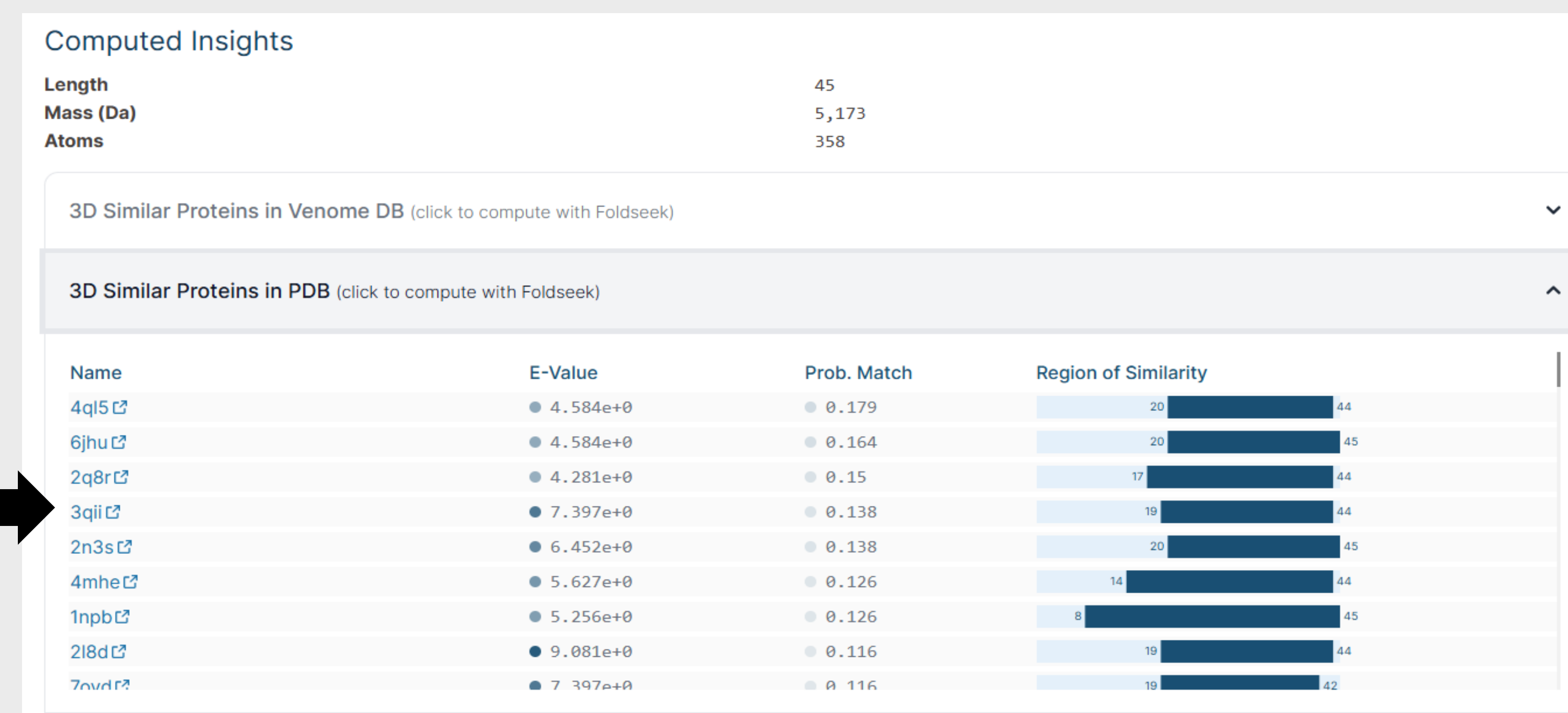


Figure 1. Comparisons and Computed Insights

Request				User		Protein		Content
ID	Date	Status	Comment	ID	Username	ID	Name	
873	3/8/2025, 2:58:50 PM	Approved	Original Proteins Added	1	admin	1	Gh_comp1090_c0_seq1	From the [Venome Biochemistry & Molecular Biology Laboratory] (https://venombiochemistrylab.weebly.com/) and predicted using [AlphaFold] (https://github.com/google-deepmind/alphafold).
874	3/8/2025, 2:58:50 PM	Approved	Original Proteins Added	1	admin	2	Gh_comp1045_c0_seq1	From the [Venome Biochemistry & Molecular Biology Laboratory] (https://venombiochemistrylab.weebly.com/) and predicted using [AlphaFold] (https://github.com/google-deepmind/alphafold).
875	3/8/2025, 2:58:50 PM	Approved	Original Proteins Added	1	admin	3	Gh_comp10207_c0_seq2	From the [Venome Biochemistry & Molecular Biology Laboratory] (https://venombiochemistrylab.weebly.com/) and predicted using [AlphaFold] (https://github.com/google-deepmind/alphafold).
876	3/8/2025, 2:58:50 PM	Approved	Original Proteins Added	1	admin	4	Gh_comp10_c1_seq1	From the [Venome Biochemistry & Molecular Biology Laboratory] (https://venombiochemistrylab.weebly.com/) and predicted using [AlphaFold] (https://github.com/google-deepmind/alphafold).
877	3/8/2025, 2:58:50 PM	Approved	Original Proteins Added	1	admin	5	Gh_comp1116_c0_seq1	From the [Venome Biochemistry & Molecular Biology Laboratory] (https://venombiochemistrylab.weebly.com/) and predicted using [AlphaFold] (https://github.com/google-deepmind/alphafold).
878	3/8/2025, 2:58:50 PM	Approved	Original Proteins Added	1	admin	6	Gh_comp1068_c0_seq5	From the [Venome Biochemistry & Molecular Biology Laboratory] (https://venombiochemistrylab.weebly.com/) and predicted using [AlphaFold] (https://github.com/google-deepmind/alphafold).
879	3/8/2025, 2:58:50 PM	Approved	Original Proteins Added	1	admin	7	Gh_comp10466_c0_seq1	From the [Venome Biochemistry & Molecular Biology Laboratory] (https://venombiochemistrylab.weebly.com/) and predicted using [AlphaFold] (https://github.com/google-deepmind/alphafold).
880	3/8/2025, 2:58:50 PM	Approved	Original Proteins Added	1	admin	8	Gh_comp1063_c0_seq1	From the [Venome Biochemistry & Molecular Biology Laboratory] (https://venombiochemistrylab.weebly.com/) and predicted using [AlphaFold] (https://github.com/google-deepmind/alphafold).

Figure 2. User Submission Requests

Figure 3. Filter Functions

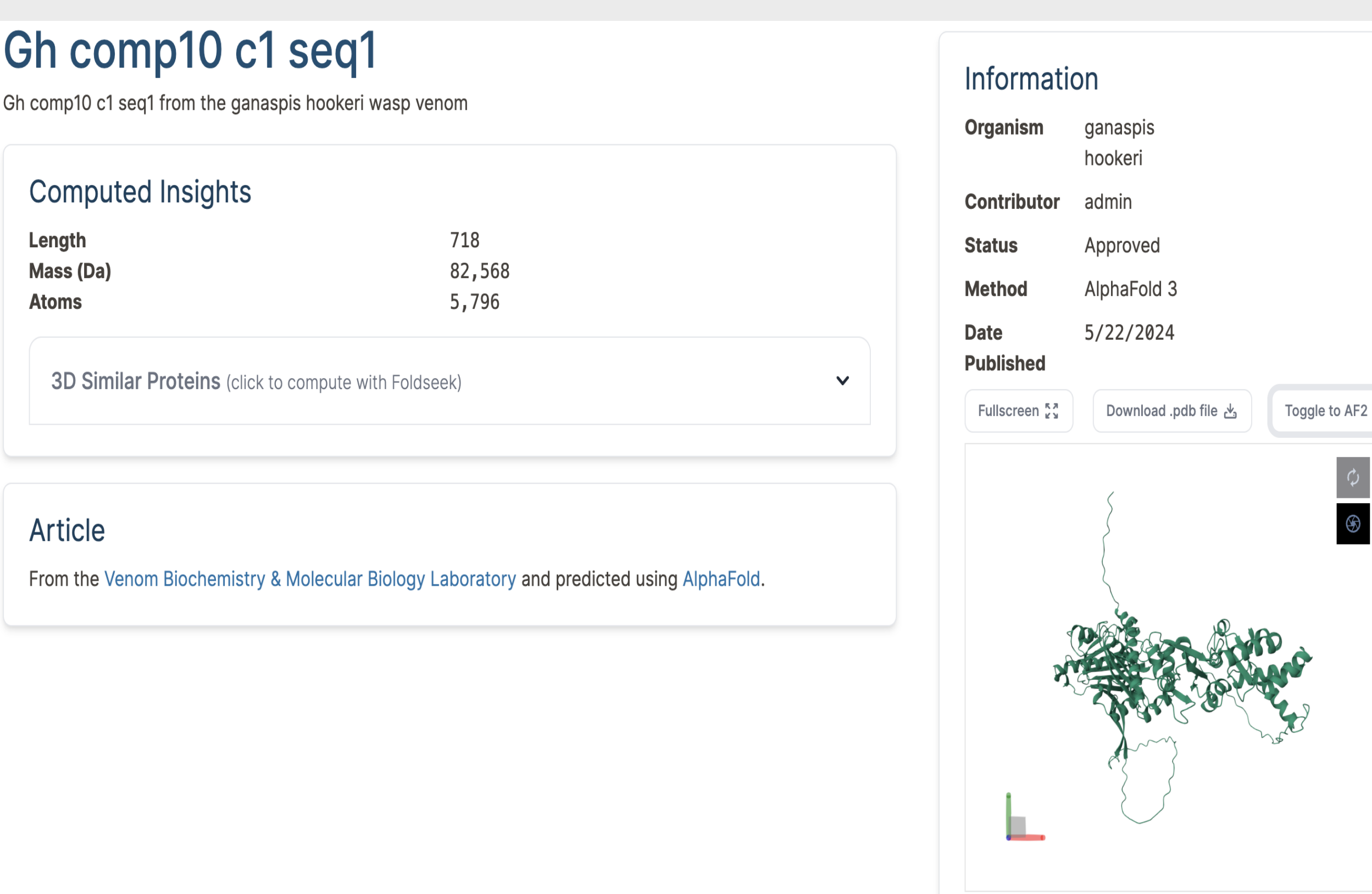
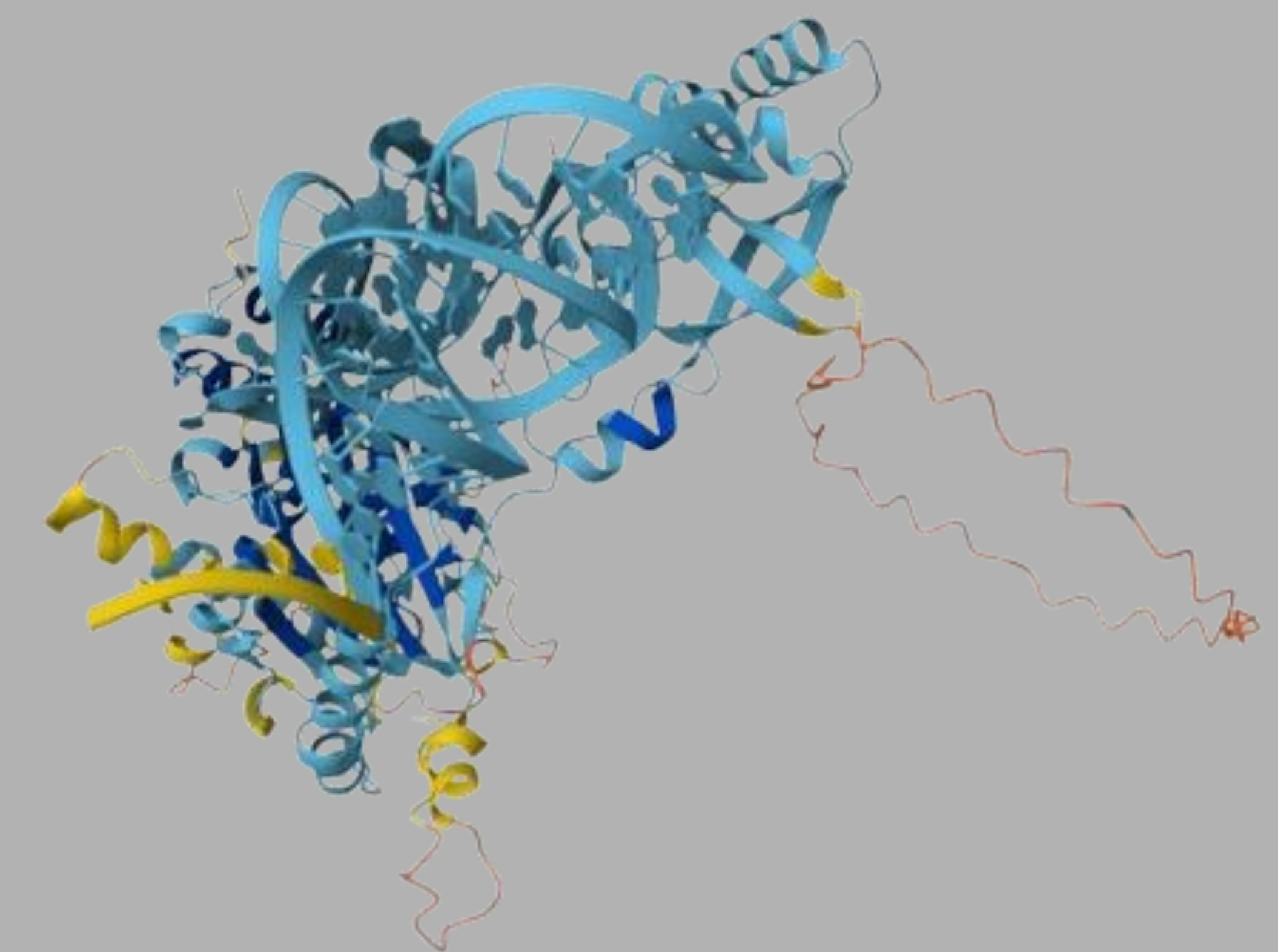


Figure 4. Protein view page including AlphaFold 3



## MEET THE VENOME TEAM

- Capstone Group



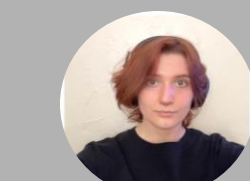
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## VISUALIZE, COMPARE, STORE

The goal to enable biochemists to learn and contribute to the venom protein database is accomplished in a few main steps within this site. Users can upload their proteins (Fig 2), Search and filter proteins (Fig 3), visualize and analyze proteins and their 3D structures (Fig 4), compare between protein models (Fig 1).