

## ACCELERATING VENOM PROTEIN RESEARCH

### The Problem

- Researchers at OSU's Venom Biochemistry Lab (*Venom Lab*) need an easy way to store, compare, analyze, and share their venom proteins.

### Our Solution

- A public-facing website with protein entries and articles to share the *Venom Lab's* research.
- A database to support over 400 venom proteins with filtering and search.
- Integration with standard protein visualization and analysis tools such as Mol\*, Foldseek and TM-Align.

# THE UNKNOWN VENOME

## A website to store and analyze venom proteins

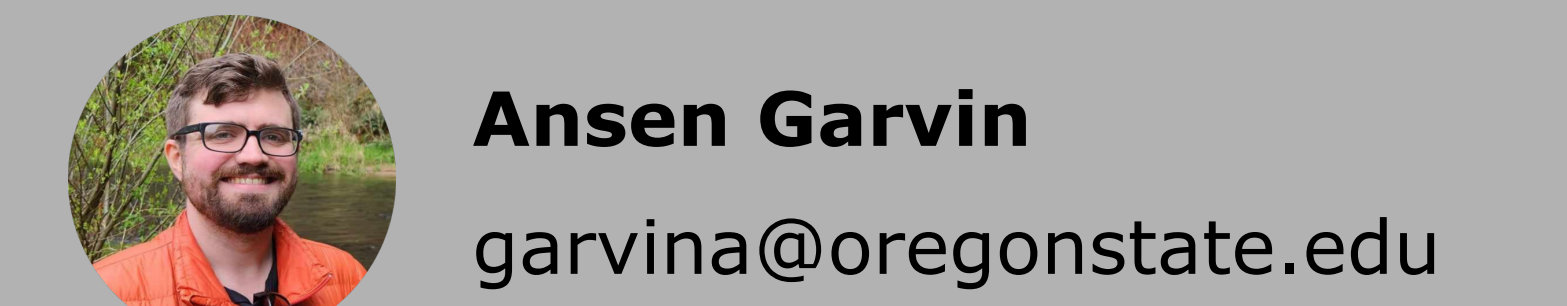
The screenshot displays the Venome website interface with several key sections:

- Search (A):** A search bar with filters for species (e.g., *ganaspis hookeri*, *leptopilina bouardi*) and amino acid length. Search results show protein entries like "Gh comp2027 c0 seq2" with details on organism, method, length, and mass.
- Analyze (B):** A "Computed Insights" section for a specific protein entry, showing a table of "3D Similar Proteins" with columns for Name, E-Value, Prob. Match, Region of Similarity, and TMAAlign. A "3D Similar Proteins" table lists entries like "Gh comp2027 c0 seq2" with E-Values ranging from  $2.878e-56$  to  $7.479e-5$ .
- Compare (C):** An "Align" section showing protein structures being compared using TMAAlign, with a "Foldseek Data" section below it.
- Learn (D):** A "Learn" section providing instructions on how to embed proteins and images into articles, with an example showing a protein structure visualization.

**Figure 2:** With Venome, the *Venom Lab* can upload their proteins, (A) search and filter for proteins, (B) visualize and analyze 3D structures, and (C) compare between them. Website users can (D) learn about the site or the Lab's research with interactive articles.

## THE TEAM

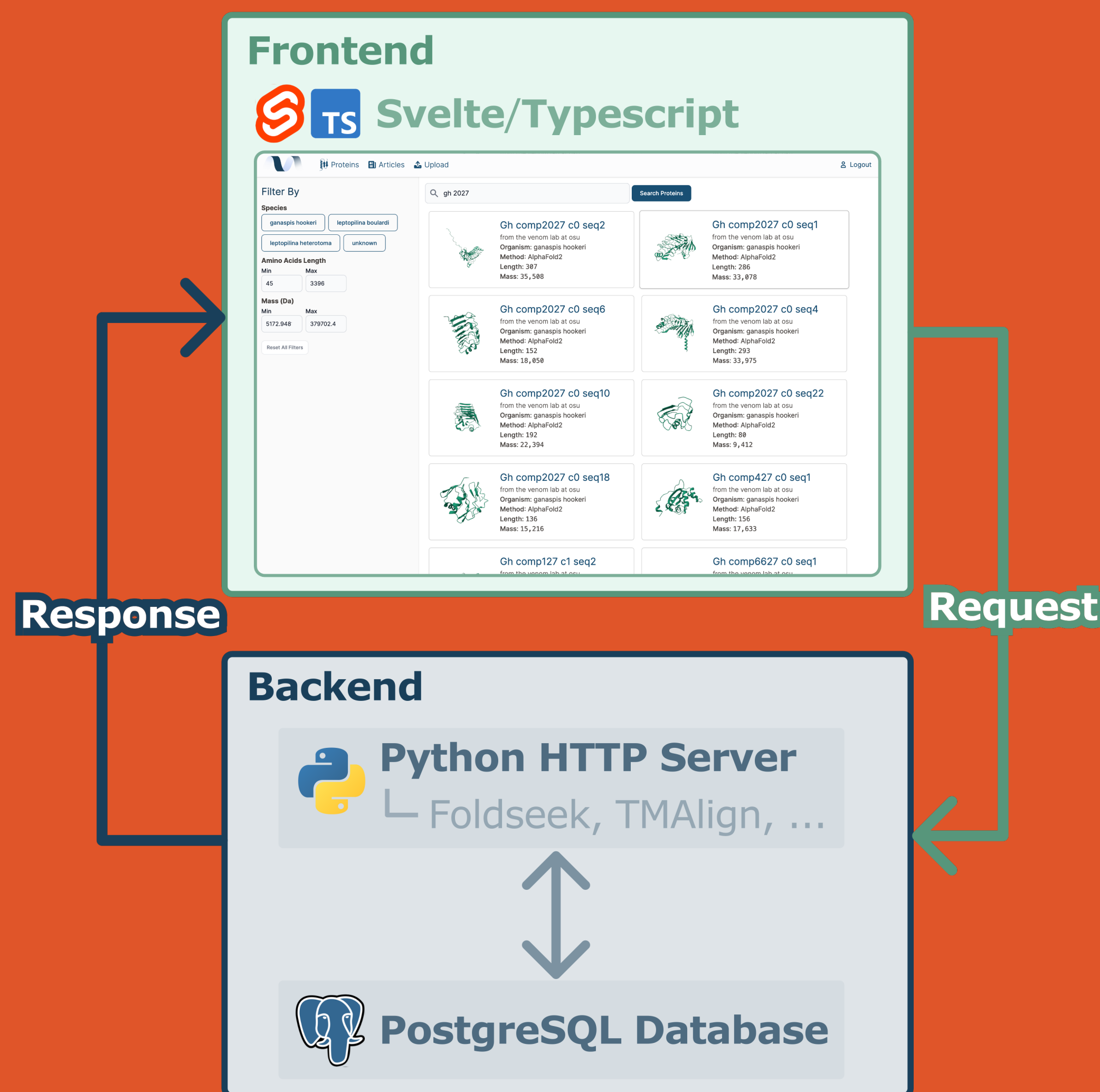
### Capstone Group



### OSU Venom Biochemistry Lab



**Figure 3:** Venome Team picture (including parasitoid wasps in the tubes).



**Figure 1:** High-level overview of our client-server architecture for the Venome site.