Toxin Overlap in *Crotalus* Snake Genus: Analyzing Venom Composition

1. **Research Question(s)**
    a. **How much toxin overlap exists between *Crotalus* snake genus?**
        i. What are the most common venom toxins across the genus?
        ii. How similar or different are venom compositions between snakes within the genus?
        iii. How much toxin overlap exists between crotalid snakes?
2. **Objective(s)**
    a. Provide a framework for analyzing venom toxin composition in *Crotalus* snakes.
    b. Develop R scripts to import, clean, visualize, and compare toxin composition data.
    c. Summarize toxin distribution across snakes within the *Crotalus* genus using graphical representation.
    d. Identify which toxins are most prevalent across the genus in an effort to identify which toxins should be the primary targets when thinking of creating universal or broad-spectrum antivenoms.
3. **Approach**
    a. I used the -omics data from several publications to create a dataset representing venom toxin composition across various *Crotalus* snakes. The dataset contains binary presence/absence values for major snake venom toxin types. Using R, we will:
        i. Load and clean the dataset.
        ii. Visualize toxin distribution using heatmaps.
        iii. Summarize toxin diversity across snakes within the genus.
4. **Selected References**

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