Investigating the diversity of Venom Allergen-like Proteins expressed in flatworms

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Scripting for Biologists Final Project
Bioinformatics Pipeline

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Overview

The evolution of (blood) parasitism in flatworms
What's VAP got to do with it?

Breanna Sipley
Masters Thesis Seminar
Biological Sciences

Friday, June 28
10:00 AM
Funchess 332

@Breanna_Sipley | Bioinformatics | Flatworms | Gene Tree | Parasites | Phyletica Lab | Biological Sciences

- Revisit
- Improve
- Move
- Generalize

What are VAPs and why do we care about them?
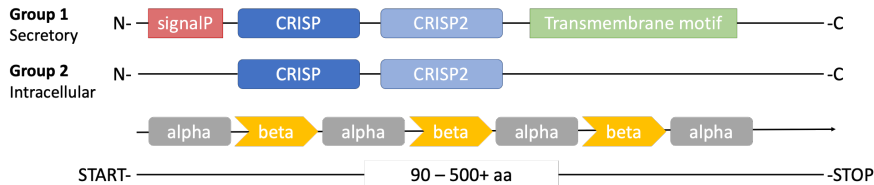
Sterol-binding secretory proteins

Figure: VAP domain architecture

Implications for parasitism

- Secreted by parasites
- Deferentially expressed
- Induce vertebrate IgE

Large, ancient radiation of parasites[*]

"Turbellaria" **Monogenea** **Cestoda** **Trematoda**
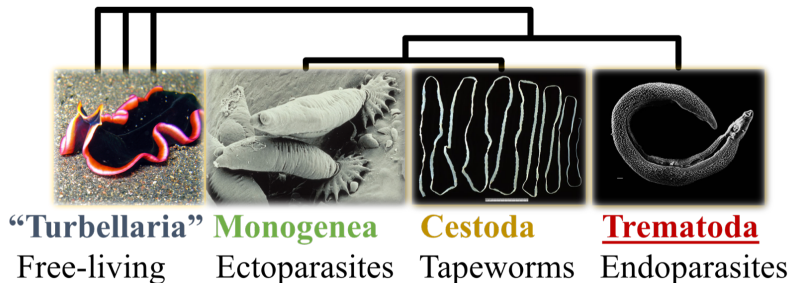Free-living Ectoparasites Tapeworms Endoparasites

Figure: Simple flatworm phylogeny indicating single origin of parasitism

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[*]Also, medical and economic value

Bioinformatics pipeline

Purpose

To survey the diversity of Venom Allergen-like Proteins (VAPs) expressed in *Schistosoma mansoni*

link: https://github.com/Sipley/pipeline

⇓

Summary

- Acquire a large dataset of sequences
- Pull out Gene Family of Interest from all sequences (non-redundant)
- Infer the best gene tree for your Gene Family of Interest
- Color best gene tree based on signal peptide predictions
- Compare average rates of amino acid substitutions

link: https://github.com/Sipley/pipeline

Wrap-up

- Revisit
- Improve
- Move
- Generalize

Questions?