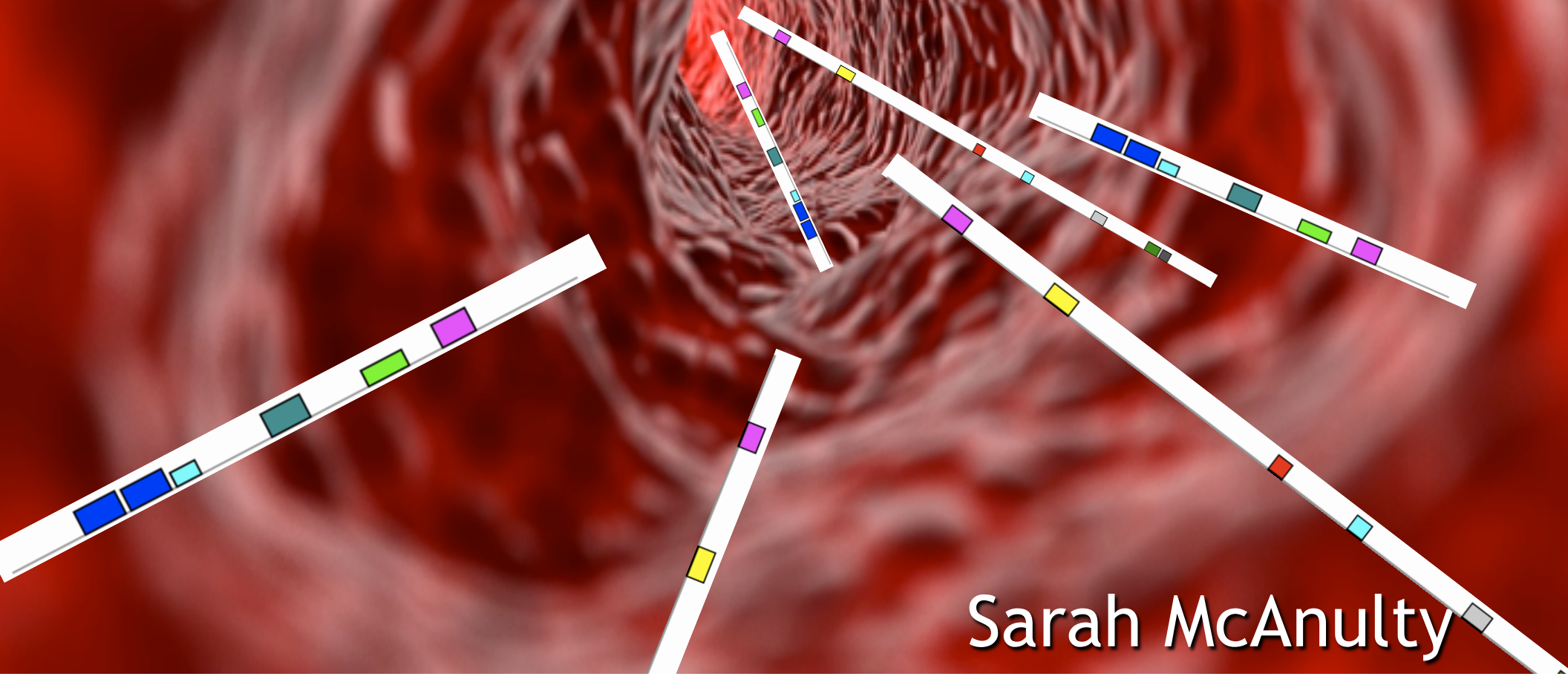


Phylogenetic Assessment of Innate Immunity's Complement Component C3 and Factor B (Bf)

In Cnidarians

3D!



Sarah McAnulty

Innate Immunity

Organism is born with its innate immune system

No development over time

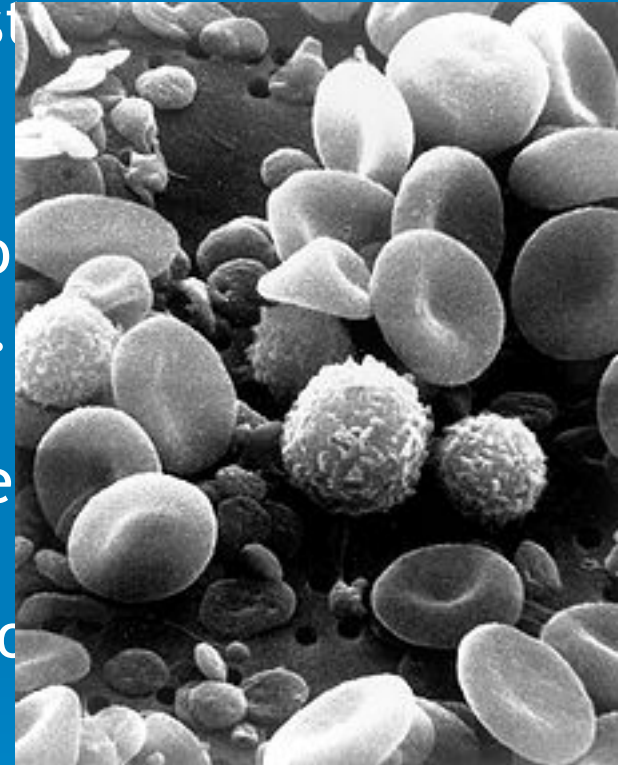
Includes Anatomical Barriers- skin, etc

Provides immediate defense against infection

Found in all classes of plant and animal life.

Antigen-nonspecific defense components

- Phagocytic cells (neutrophils, monocytes, macrophages);
- Cells that release inflammatory mediators (mast cells, and eosinophils);
- Natural killer cells (NK cells)
- Molecules such as **complement proteins**, acute phase proteins, and cytokines.



Which organisms are known to possess an innate immune system?
How does it compare to adaptive immunity or “cell-based” immunity in vertebrates?

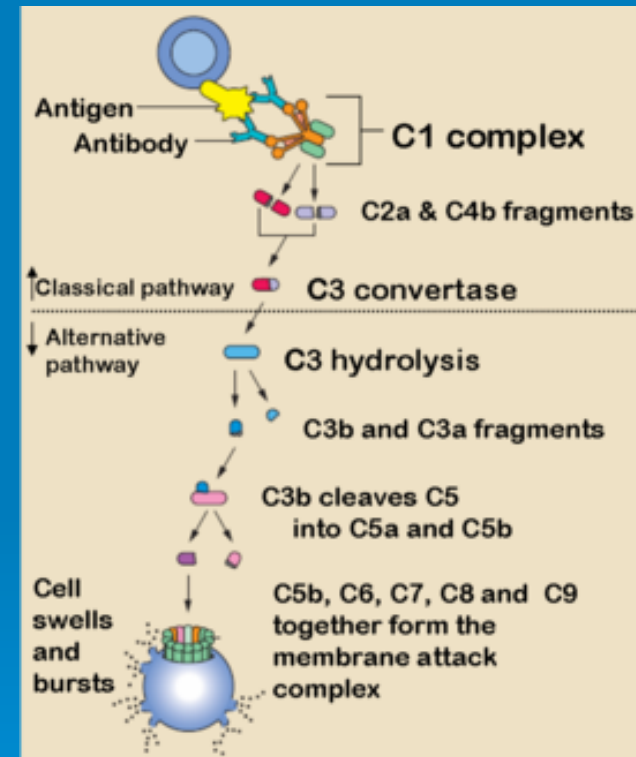
The Complement System

Series of proteins circulating in the blood
Circulate in an inactive form.
Become sequentially activated
Work in cascade- binding of one protein promotes the binding of the next protein in the cascade.

Complement system genes

- Code for Proteins
- Proteolytic cleavage
- Smaller components
- Bind to varied
- Sometimes bind to continue cascade

Varied what?



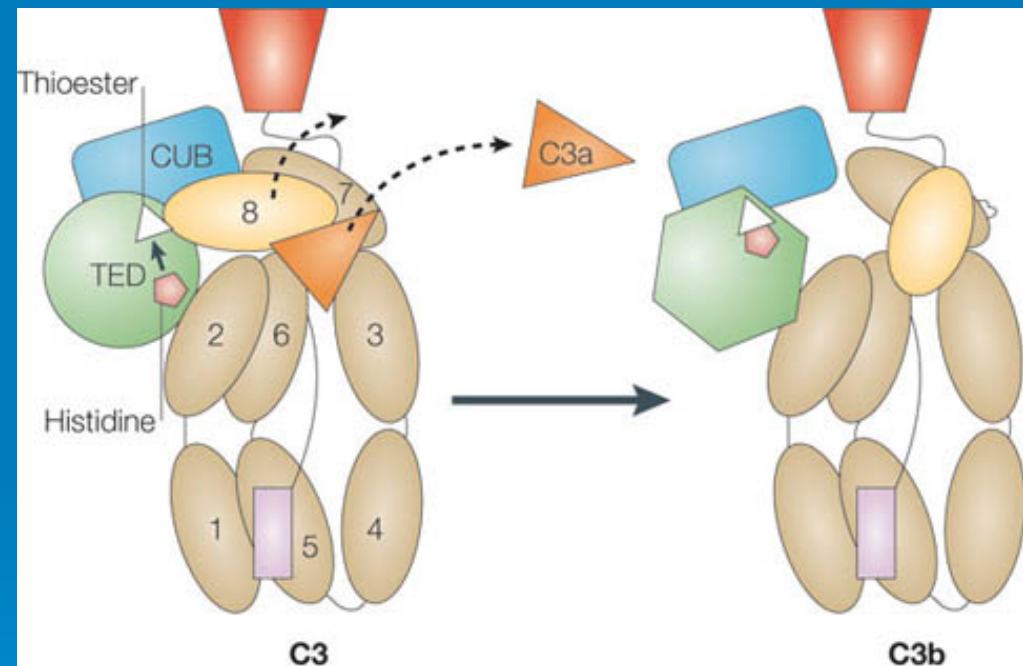
Complement Component C3

Part of the Classical Complement Pathway

Cleaved by C3 Convertase

C3a- an anaphylotoxin-
triggers release of substances which
produce a local inflammatory response

C3b- serves as an opsonizing agent (a
binding enhancer for the process of
phagocytosis)



Complement Factor B (Bf)

Part of the alternative Pathway of complement activation

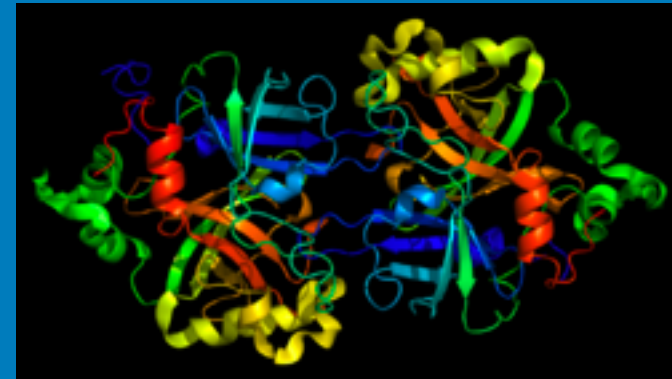
Factor B is a single chain polypeptide floating in bloodstream.

Gets cleaved by Factor D

Bb- Associates with C3b to form the alternative pathway C3 convertase.

-Proliferates preactivated B lymphocytes

Ba- inhibits proliferation of B lymphocytes



Why switch fonts?

Methods

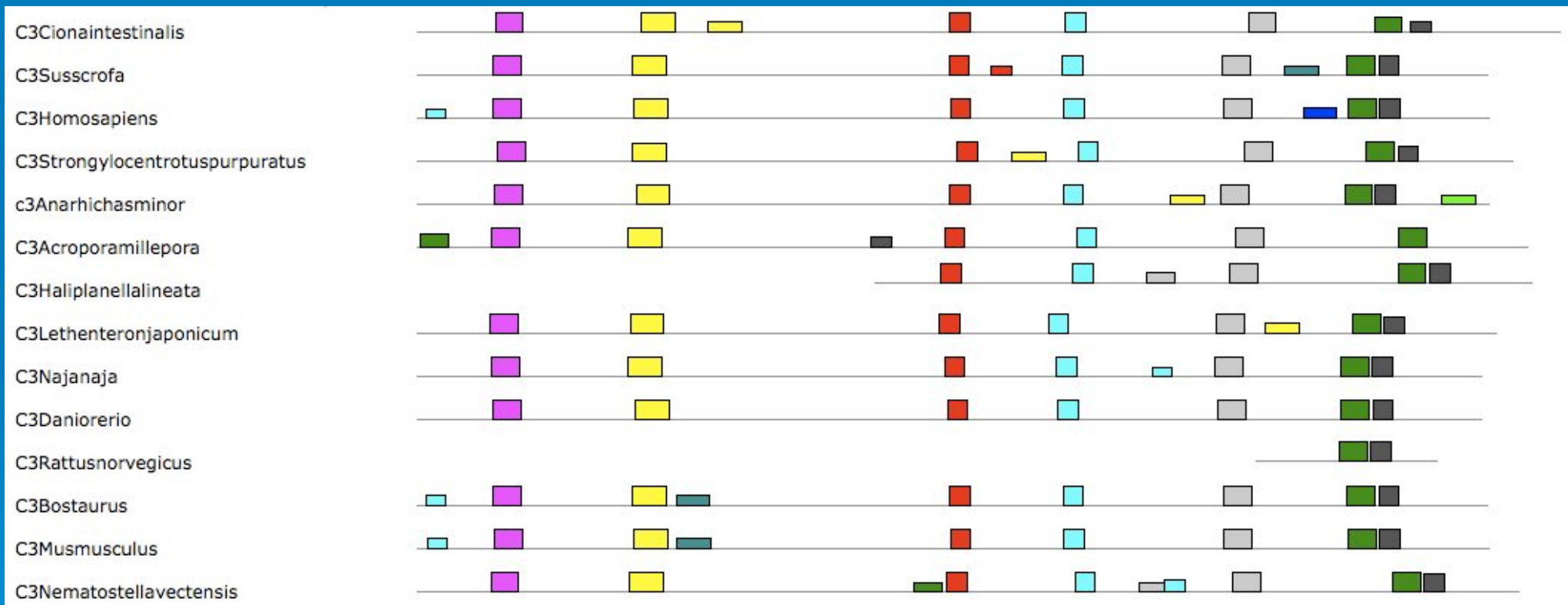
- *Collected C3 and Factor B sequences from NCBI/Edbase
- *Blast- Assure Ed accuracy, acquire reference frame
- *MEME- motif analysis
- *Glam2- Gapped motif
- *SeqBoot- Acquire bootstrap value
- *ProtDist-
- *Neighbor-
- *Consense- Of the 100 trees
- *FigTree- Acquire attractive tree

Explain your goal: i.e., to look for these proteins in *Edwardsiella*, a model cnidarian. Do you expect cnidarians to have complement genes?

Drawing the tree isn't really a method. You could have drawn it by hand. So you can leave that out.

Complement Component C3 Motifs

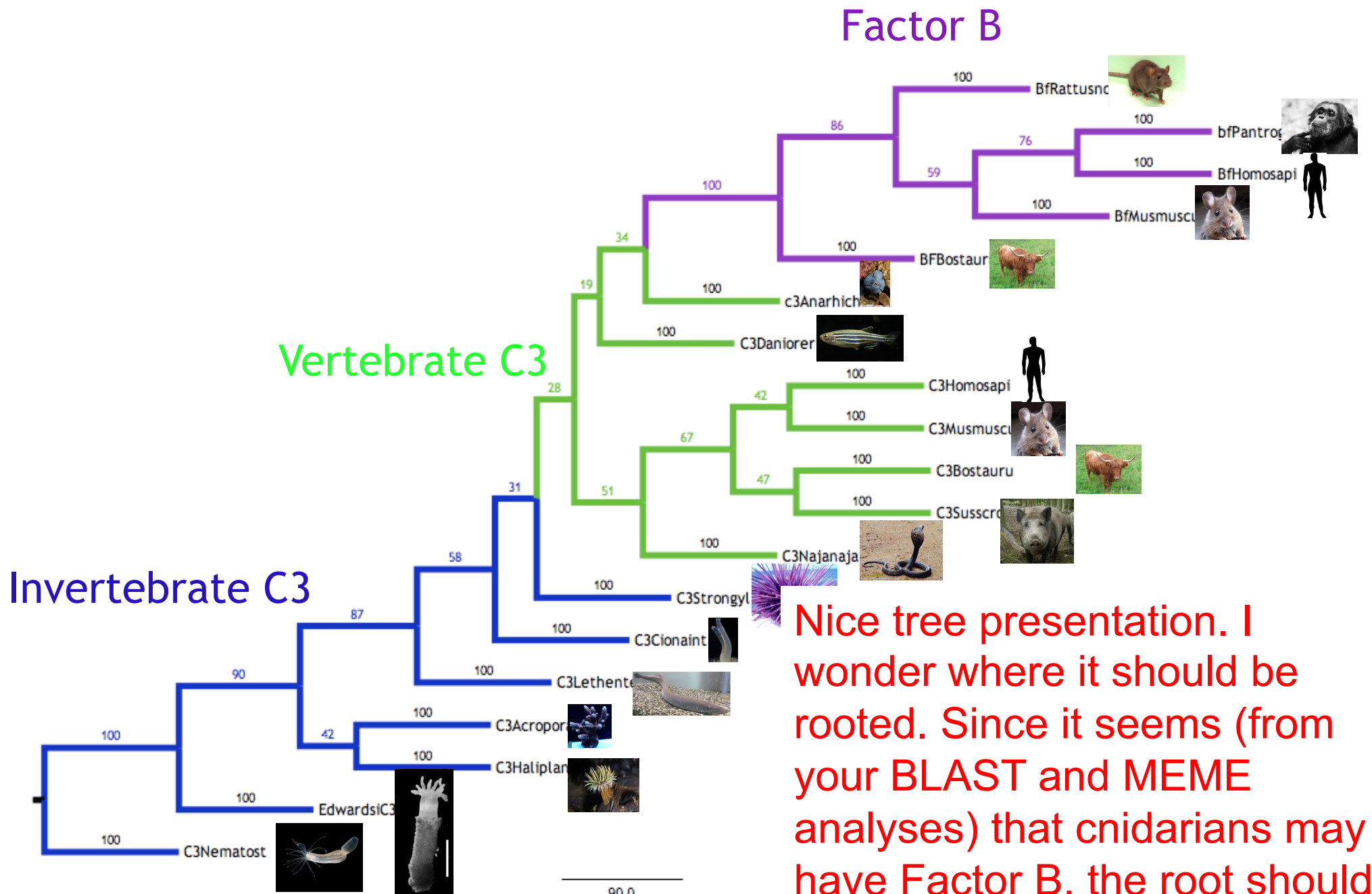
First indicate how you searched for sequences and how many sequences you found. Then indicate that you looked for conserved motifs to corroborate the identify of the cnidarian proteins and examine whether their motif organization is conserved.



Some indication of scale? It would be useful to point out that the basic order of conserved motifs is highly conserved across

Complement Factor B Motifs





Nice tree presentation. I wonder where it should be rooted. Since it seems (from your BLAST and MEME analyses) that cnidarians may have Factor B, the root should probably go between the C3s and Bfs

Future Directions

Get full Factor B sequences, especially from invertebrates

Did Factor B in inverts come about differently?

More precise language would help here. What do you mean by “come about differently?”

References

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