Characterization of Interleukin-17 in Botryllus schlosseri: A Driver of the Innate Immune Response

Department of Molecular, Cellular, and Developmental Biology

Soham Ray, Rafael Solorzano, Dr. Anthony De Tomaso

INTRODUCTION

- Interleukins are a family of cytokines (signaling proteins) that play a role in the immune response.
- Botryllus schlosseri possess only one Interleukin: Interleukin-17 (IL-17).
- How has IL-17 evolved and how is it regulated in Botryllus schlosseri?

METHODS

- Genomic and Transcriptomic data was utilized to identify different members of the IL-17 family:
- Phylogenetic tree (using Maximum likelihood)
- Genomic Position and Direction
- Regulation of IL-17 was studied through:
- Differential expression of candidate ligand and receptor genes during Botryllus's normal life cycle using transcriptome data
- RT-qPCR was used to identify if IL-17 ligands or receptors had different expression levels during infection (with BioParticlesTM)

RESULTS

- IL-17 ligand expression is greater in stages A-C compared to stage D
- IL-17 receptor expression was constant throughout the balstogentic cycle
- Select IL-17 members were upregulated when infected with BioParticlesTM

DISCUSSION

- The genomic scaffolds indicates that several IL-17 members are a result of gene duplication which is a precursor for the evolution of interleukins
- The upregulation of IL-17 during an infection suggests that the gene in Botryllus is integral for its innate immune response.

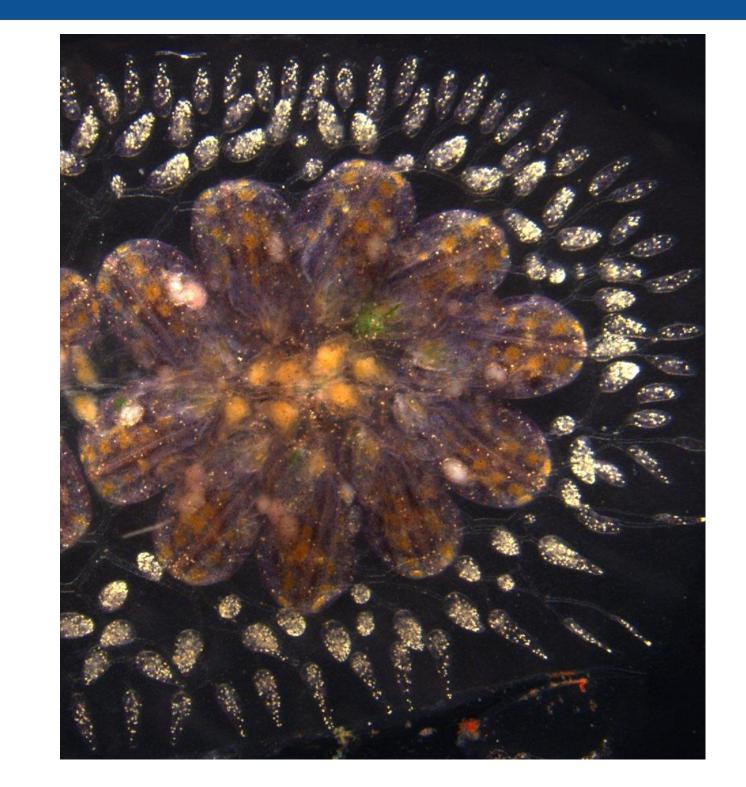
Acknowledgments

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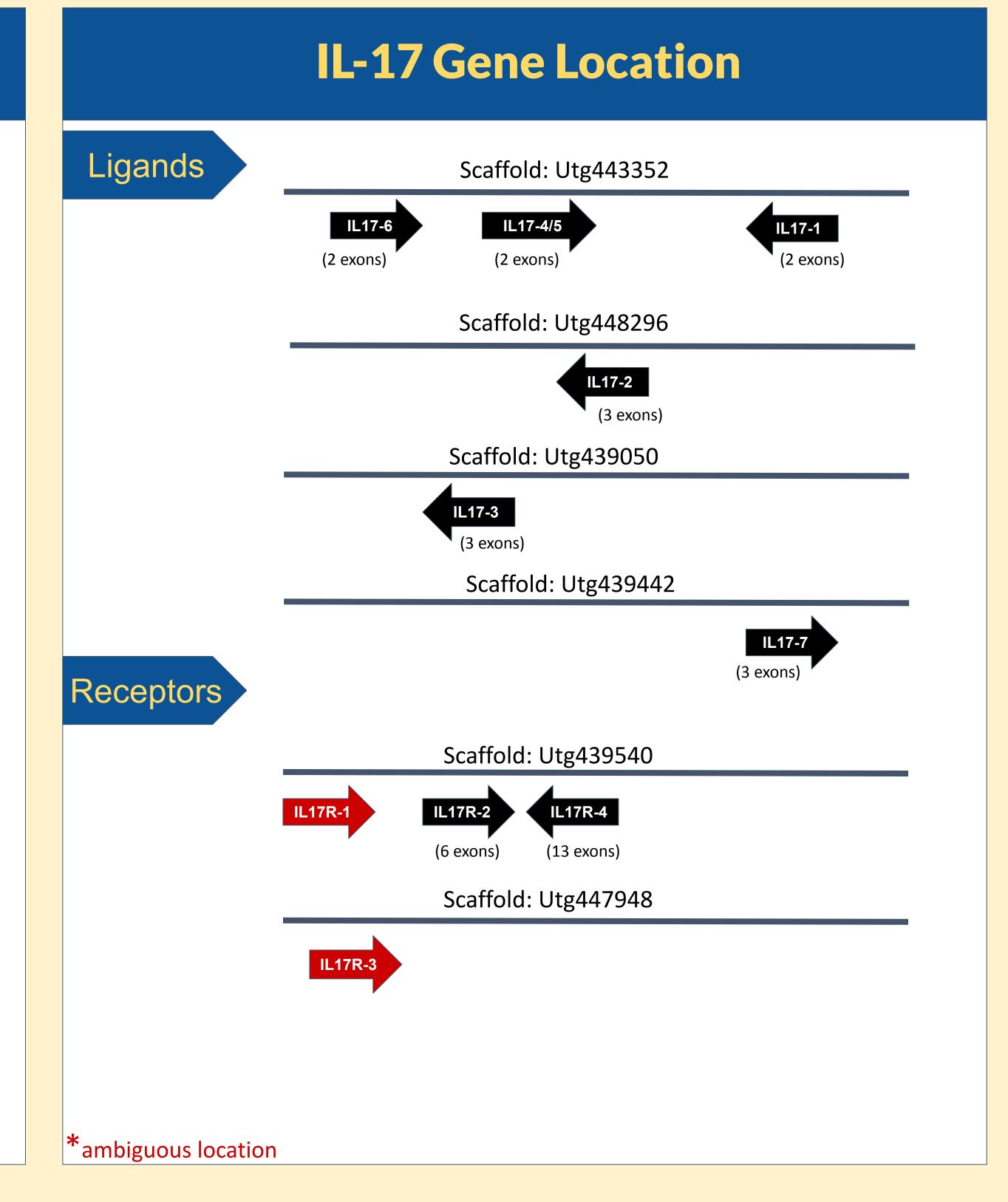
The upregulation of Interleukin-17-L7 during an infection suggests

that the gene in B. schlosseri is integral for its innate immune response.

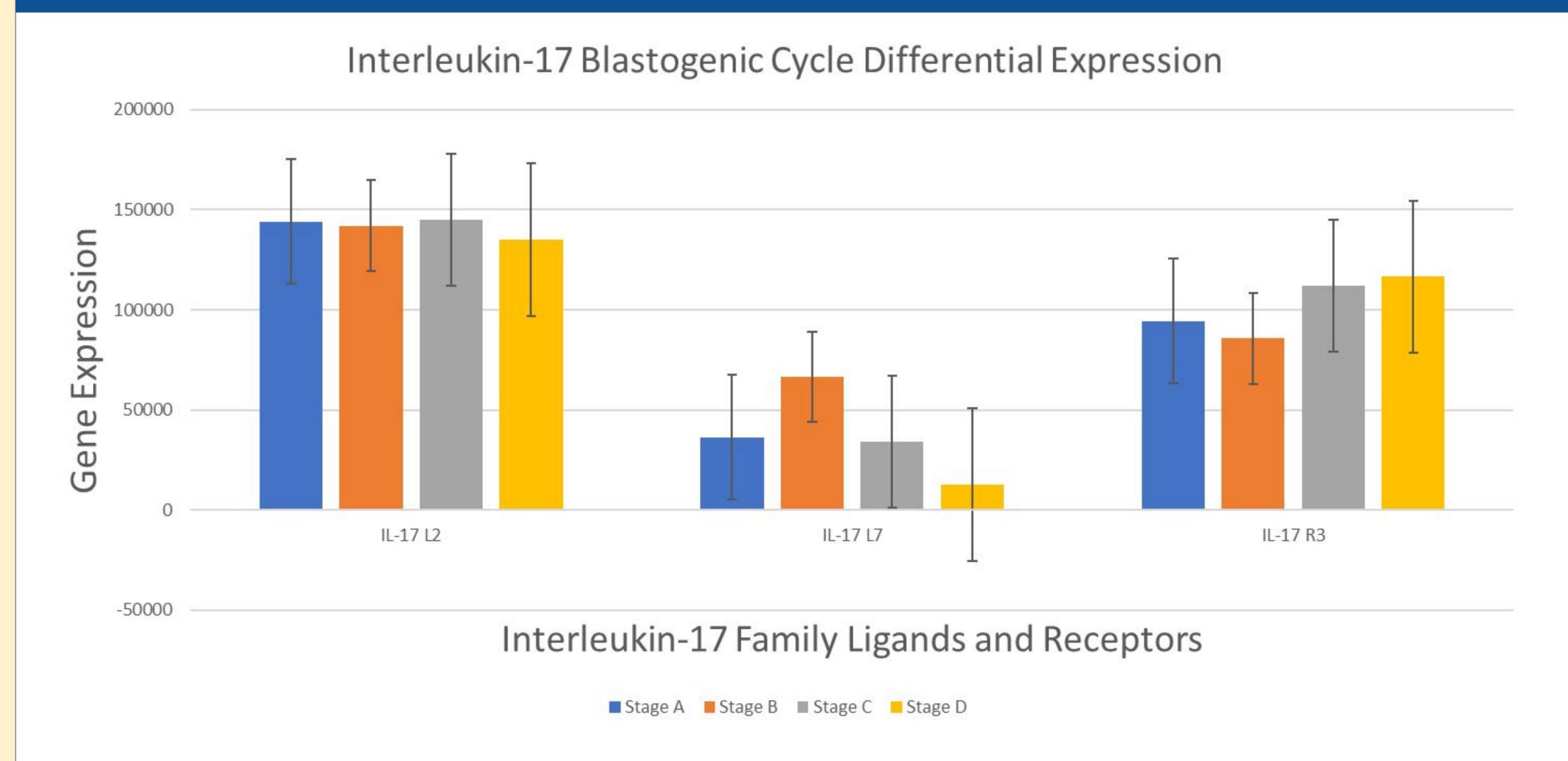
Botryllus schlosseri



- colonial tunicate
- closest invertebrate relative to humans
- 80% of genes in sequenced genome have vertebrate homologs
- 7 day blastogenetic cycle



Differential Expression: IL-17 Expression throughout its Life Cycle



Location of IL-17 Genes Ligands Receptors - sp Q8BH06 I17RE MOUSE - sp Q8NFR9 I17RE HUMAN - sp Q8K4C2 I17RC MOUSE - sp Q8NAC3 I17RC HUMAN sp Q60943 I17RA MOUSE - sp Q96F46 I17RA HUMAN sp Q9JIP3 I17RB MOUSE sp Q9NRM6 I17RB HUMAN - sp Q8JZL1 I17RD MOUSE sp Q8NFM7 I17RD HUMAN IL17 4R Bschlosseri IL17 1R Bschlosseri IL17 3R Bschlosseri

*IL-17 ligand tree remains unresolved (above is an incomplete image)

IL17 2R Bschlosseri

RT-qPCR: Members in the IL-17 family are upregulated when faced with an Infection

