



- Brooding *Astatotilapia burtoni* may regulate endocrine signals to induce starvation.



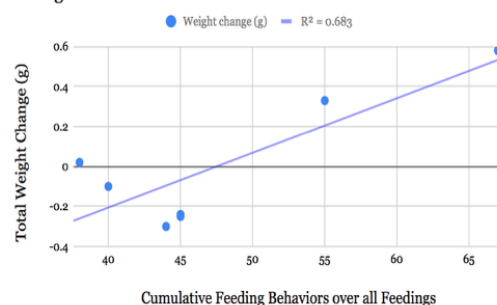
- AgRP is a hunger-inducing neuropeptide that has not been well-characterized behaviorally in these fish.

We aim to correlate feeding behavior with AgRP expression in female *A. burtoni*

Behavioral Sampling to Find a Proxy for Feeding

We used behavior sampling to quantify several behaviors in one population. Using that data, we were able to determine a behavior that is positively correlated with mass change and therefore eating behavior.

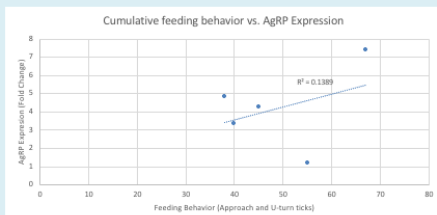
Total Feeding Behaviors over all Feedings compared to Weight Change



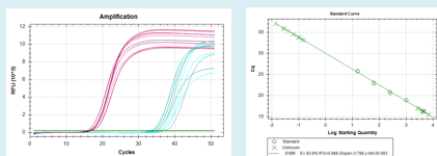
- (Right) Ethogram for behavior sampling.
- (Left) Results for cumulative feeding behaviors using Approach and U-turn data show a positive correlation of 0.683.

Ethogram	
Behavior	Description
Approach and U-turn	Fish approaches pellet, bites pellet, and turns around to swim away
Approach (doesn't eat)	Fish approaches the pellet (may bite) but doesn't consume it
Chase n' Bite	Fish chases and bites another fish
Reverse	Fish swims in reverse

Quantitative Real-time PCR



- Gene expression data showed that there is a slight positive correlation between feeding behavior and AgRP expression (top).
- Amplification curves for rfl32 (pink) and AgRP (blue). Ct values begin around cycle 19 for rfl32 and 37 for AgRP (bottom left)



- Standard curve for rfl32 serial dilution (bottom right). AgRP standards were omitted due to inconsistency between serial dilution concentrations.

Conclusion / Working Model

Due to the weak correlation and largely inconclusive data, we believe further procedure refinement is required with regards to AgRP regulation in nonbrooding *Astatotilapia burtoni*.

Acknowledgments

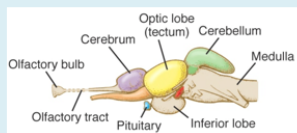
We would like to thank Suzy Renn, Karen Maruska, and Greta Glover for their help with this project

Literature Cited

Volkoff H. (2011) Control of Appetite in Fish. Encyclopedia of Fish Physiology: From Genome to Environment, Vols 1-3:1509-14.

Porter, Danielle T., et al. "Distribution and Female Reproductive State Differences in Orexigenic and Anorexigenic Neurons in the Brain of the Mouth Brooding African Cichlid Fish, *Astatotilapia burtoni*." *The Canadian Journal of Chemical Engineering*, Wiley-Blackwell, 13 July 2017, onlineibrary.wiley.com/doi/10.1002/cne.24268/full.

The main experimental components...



- Behavior sampling
- RNA extraction and reverse transcription
- qPCR analysis

(1) Tanks were fed a normalized amount of food by tank biomass. Behavior sampling was performed for 2 weeks while fish were eating.

(2) Fish brains were removed and RNA was extracted and reverse transcribed for downstream qPCR.

(3) Whole-brain AgRP expression was quantified by qPCR using rfl32 as a housekeeping gene.