

ZEBRAFISH (*DANIO RERIO*): A MODEL ORGANISM?



Current Progress

- ▣ Previous work has shown significant behavioral effects induced by the administration of pharmacological agents, making zebrafish an effective model for translational drug research
- ▣ Recently we have shown that Zebrafish are an effective model for drug dependency, as evidenced by distress related behavior
- ▣ Additionally we have drawn parallels between behavioral phenotypes and physiological endpoints
 - Stress Hormone (Cortisol) levels

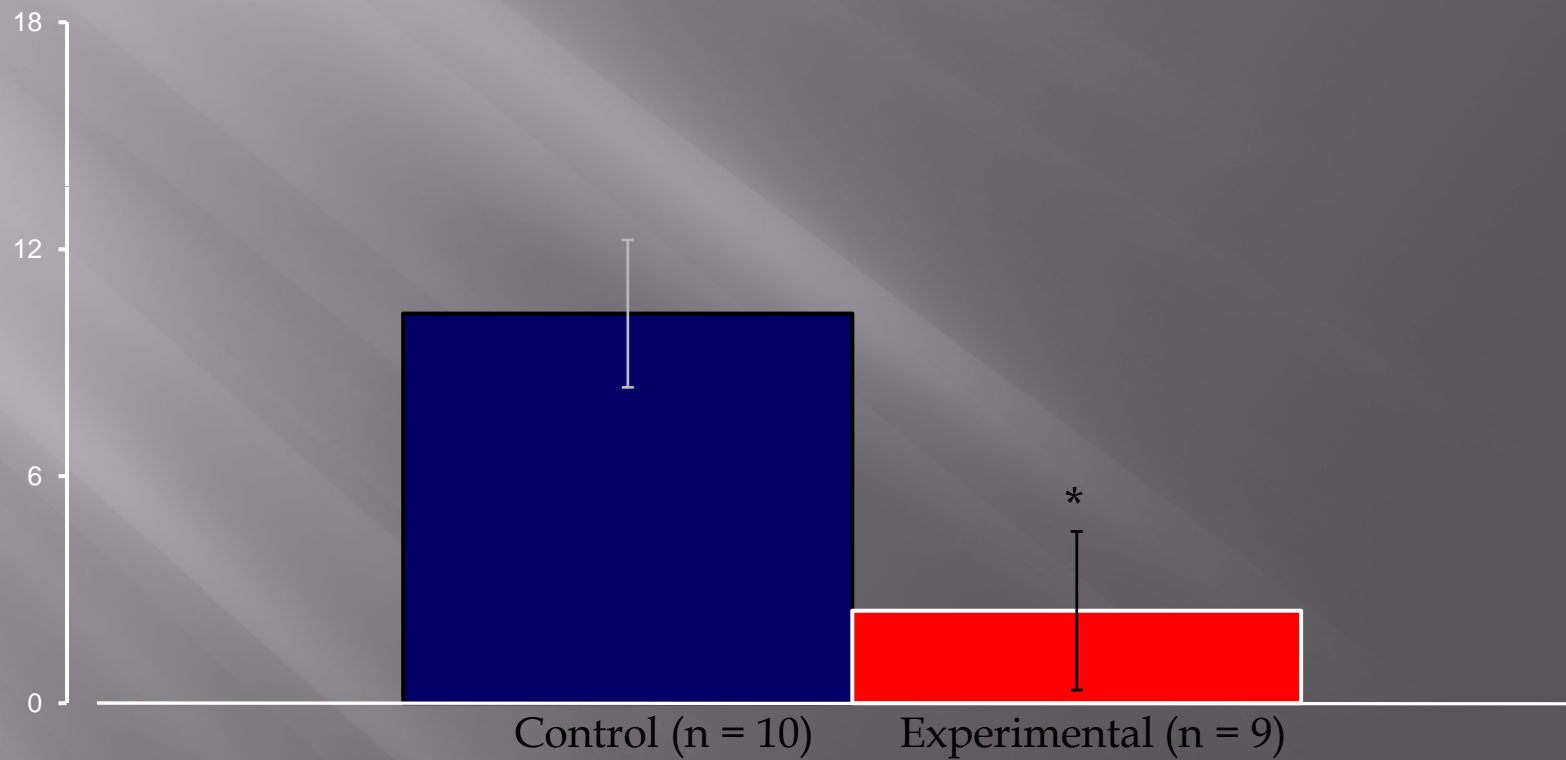
Diazepam Withdrawal

Highly significant behavioral data:

- Average number of entries to the upper half: $P \leq 0.011$
- Average time spent in the upper half: $P \leq 0.0042$
- Number of erratic movements: $P \leq 0.012$

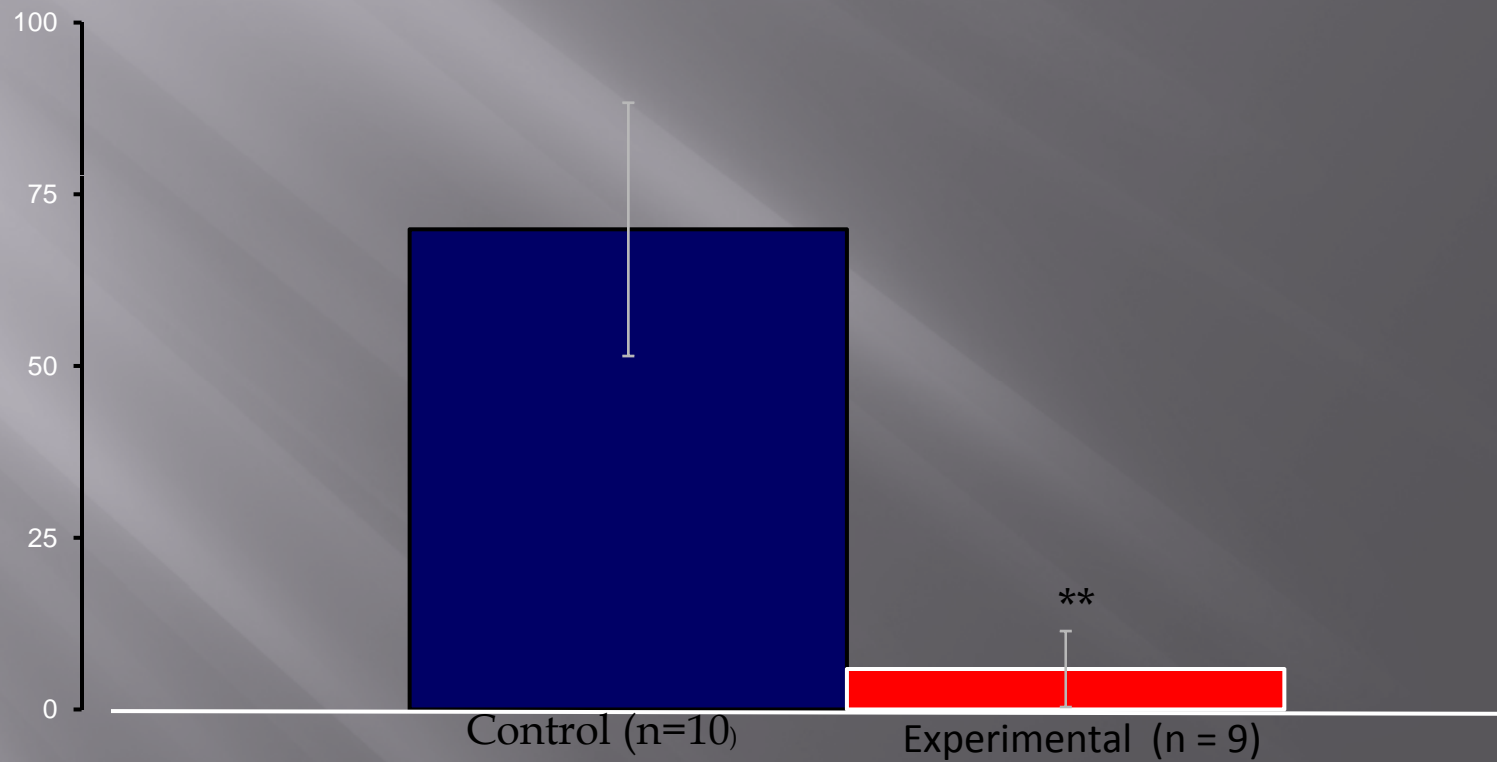
Diazepam Withdrawal

Transitions to the upper half



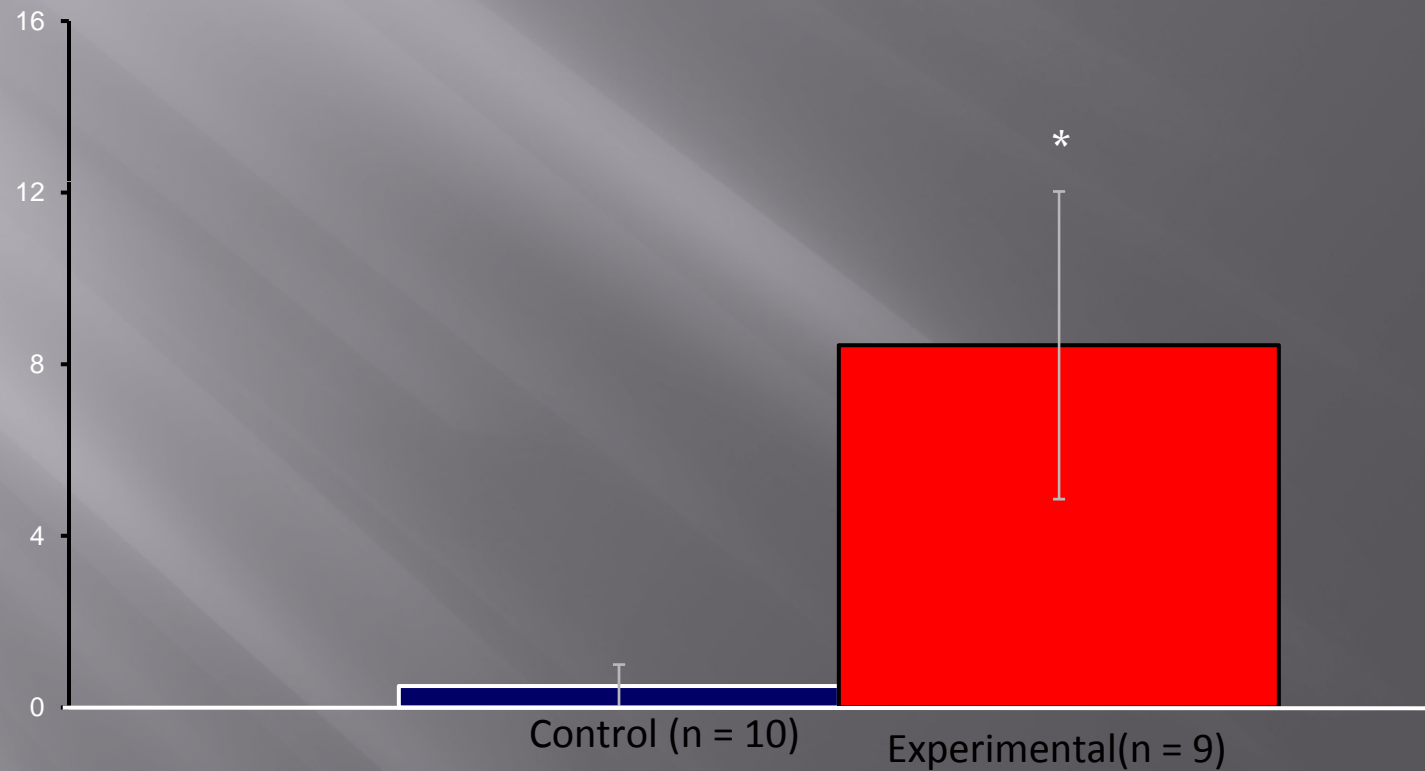
Diazepam Withdrawal

Time in the upper half (s)



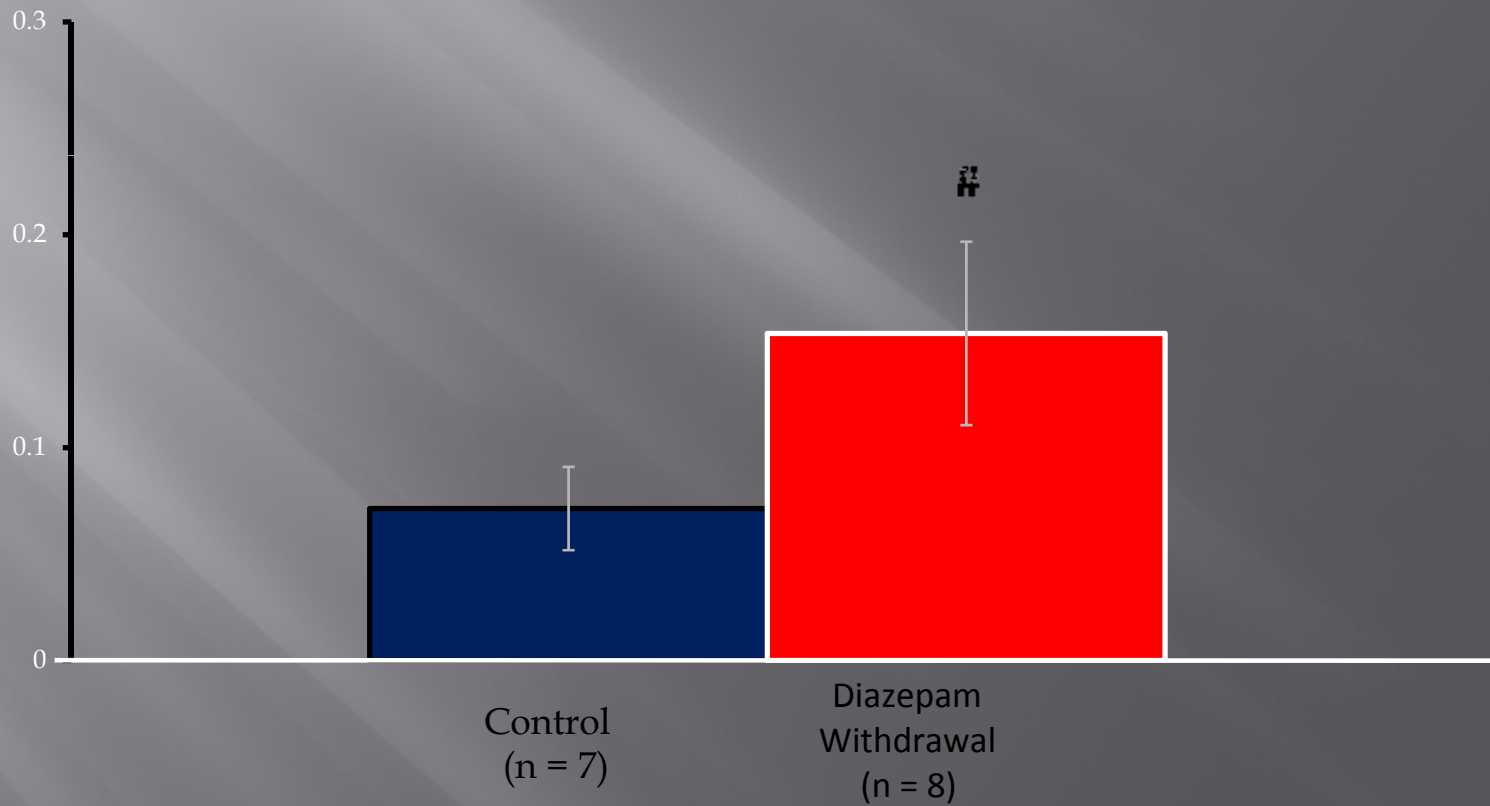
Diazepam Withdrawal

Erratic Movements



Diazepam Withdrawal

Total Cortisol ($\mu\text{g/dL}$)



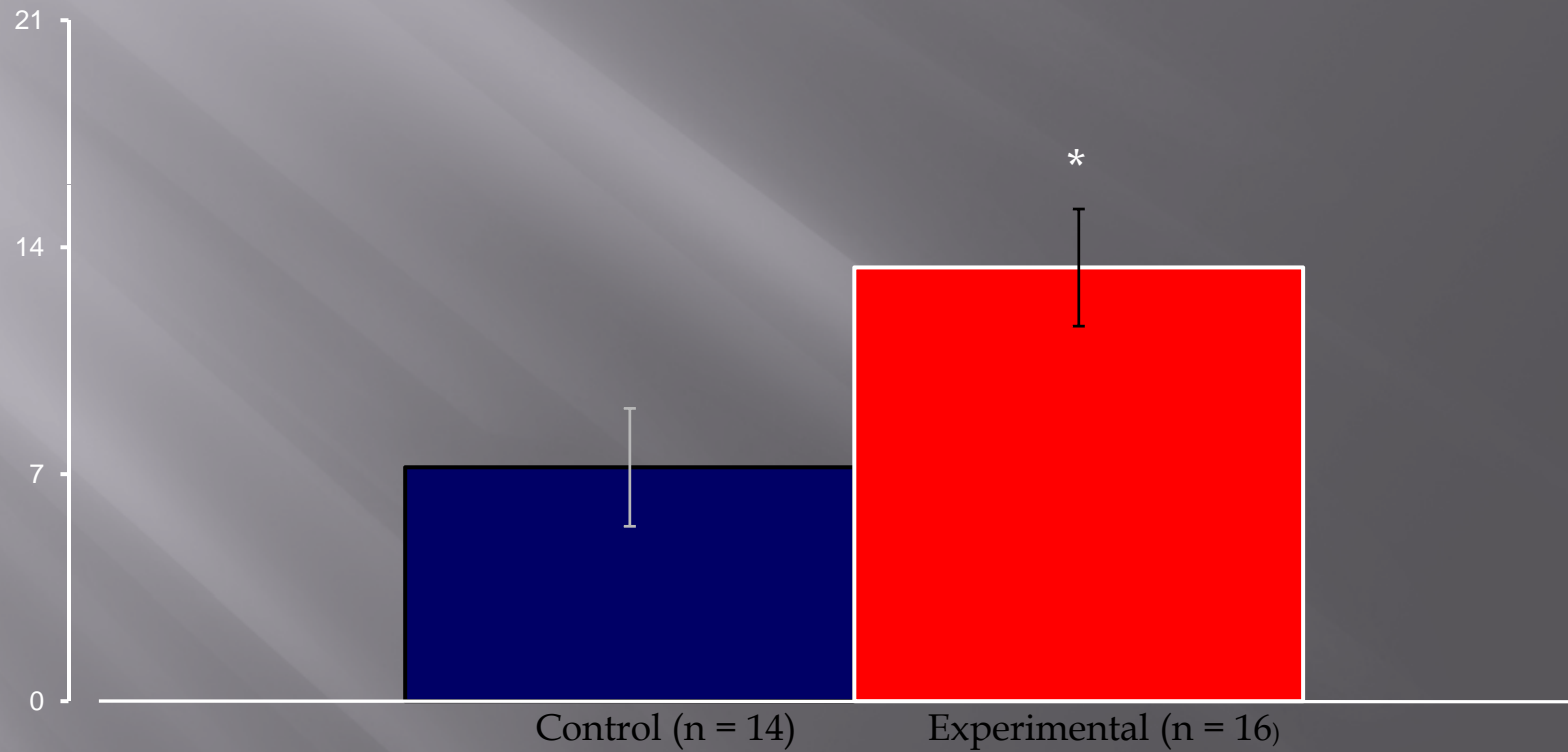
SSRI Withdrawal

Highly significant behavioral data:

- Average number of entries to the upper half: $P \leq 0.011$
- Average time spent in the upper half: $P \leq 0.0002$

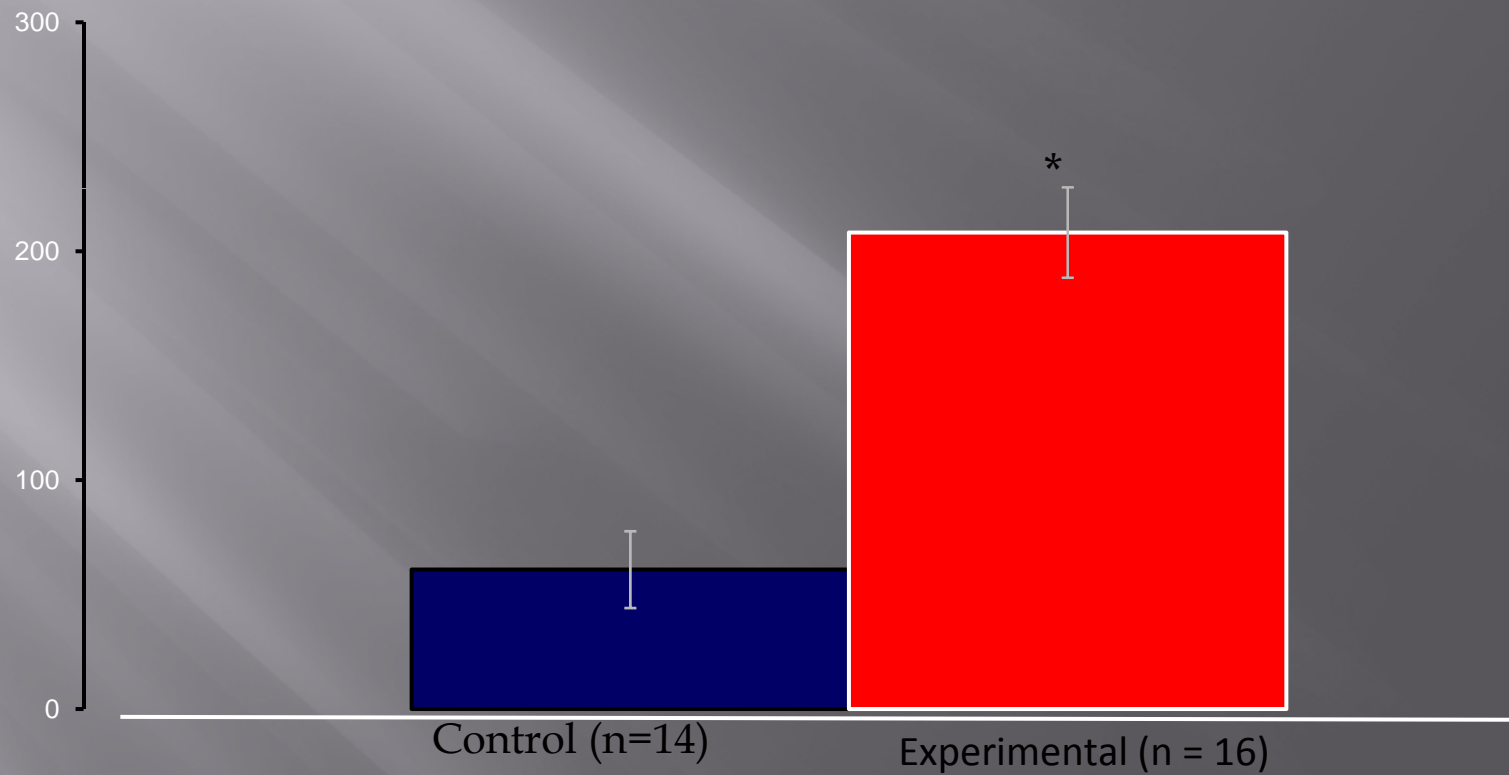
SSRI Withdrawal

Transitions to the upper half



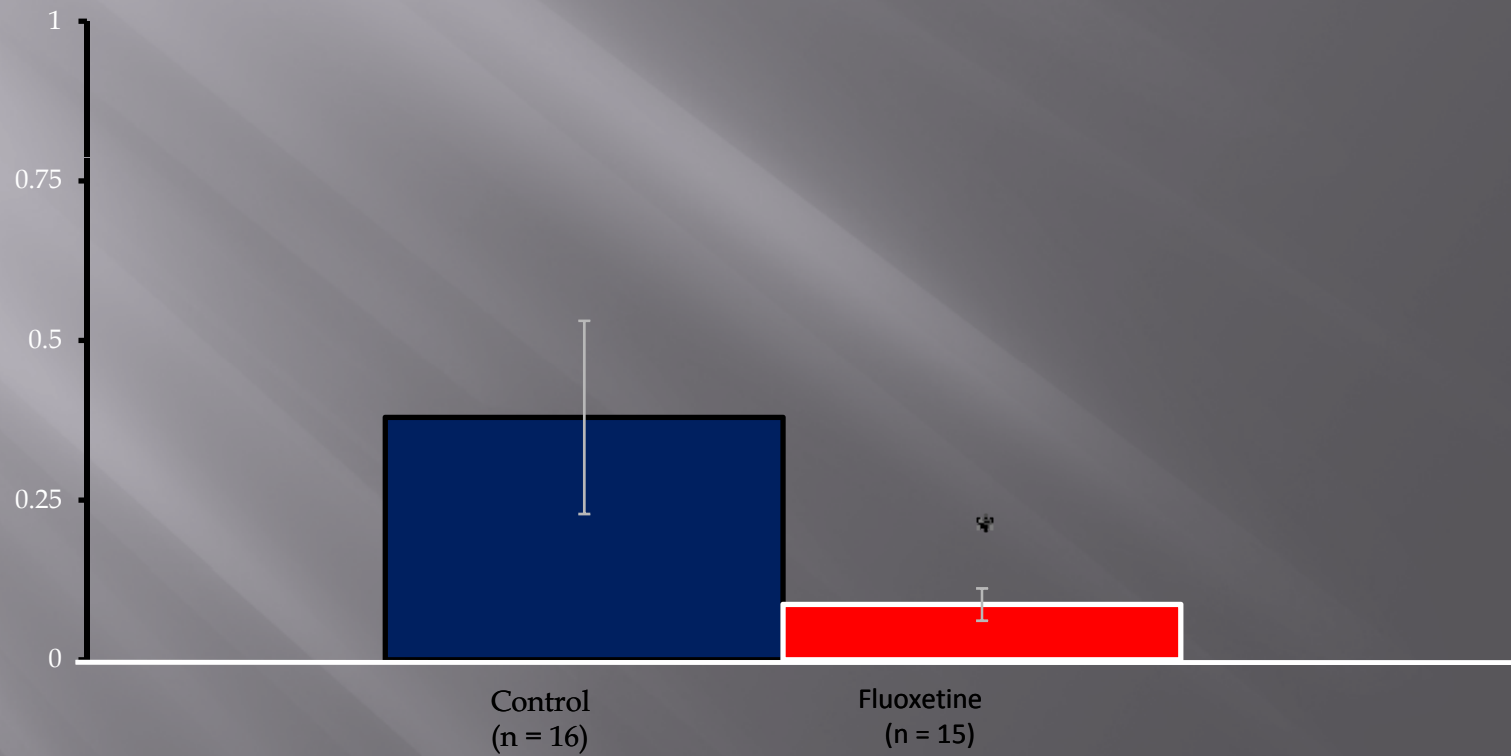
SSRI Withdrawal

Time in the upper half (s)



SSRI Administration

Total Cortisol ($\mu\text{g/dL}$)



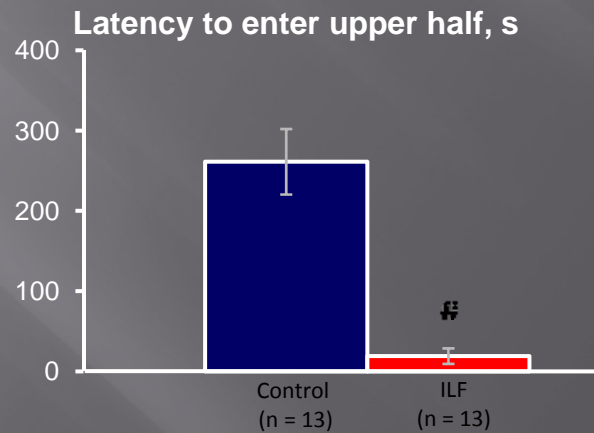
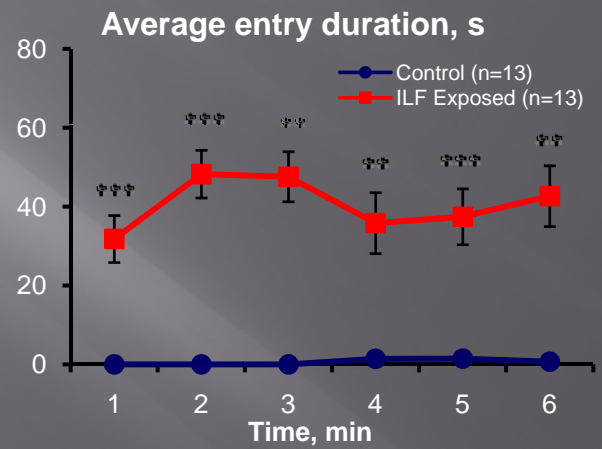
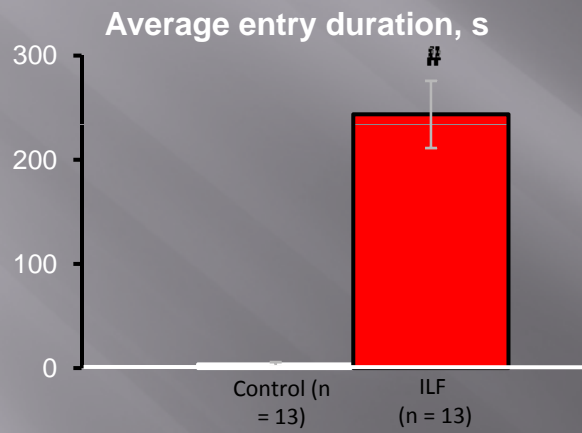
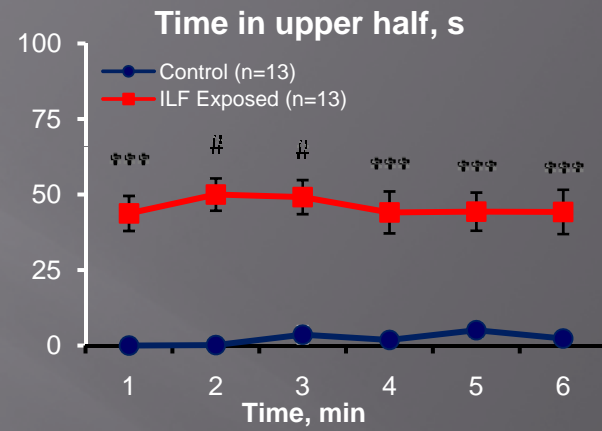
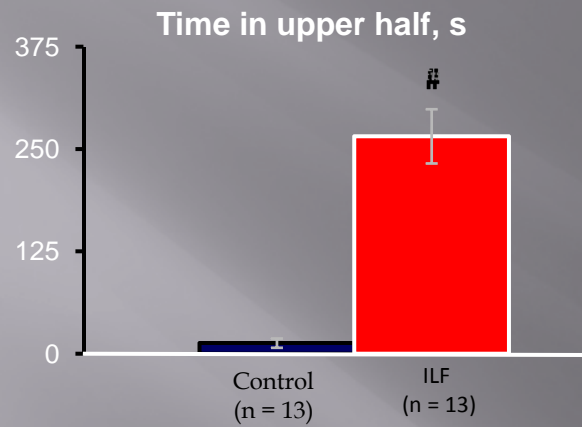
Current/Future Directions

- ▣ Continue to develop pharmacological and behavioral models
 - Drug dependency (addiction) and withdrawal paradigms
 - Stress models
 - ▣ Indian leaf fish exposure

- ▣ Physiological endpoint measurements
 - Whole body Hormone levels (Cortisol)
 - Gene expression
 - ▣ RNA isolated from brain and body samples
 - Develop primers for specific genes of interest (NPY, NPY receptor, 5-HT, SERT, SERT receptor, BDNF, GABA)
 - Northern blot analysis

ILF Exposure

Method: zebrafish are generally housed together in a tank (as a shoal), the Indian leaf fish was added to the tank for a period of 24-48 hours (overnight or two days). After the exposure period the zebrafish were tested in the novel tank diving test and then sacrificed for physiological testing.



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- ▣ Lab members:
 - ▣ Dr. Allan V. Kalueff PhD
 - ▣ Carisa L. Bergner
 - ▣ Rupert J. Egan
 - ▣ Peter C. Hart

- ▣ Our collaborators Dr. Glasgow and Dr. Amri