

22 March 2015 – JB

Zebrafish Lab

Zebrafish, native to freshwater and part of the minnow family, are often used as vertebrate model organisms in the study of embryonic development. They are used because they develop externally in transparent eggs, so tracking progress is easy. In this experiment, we will be testing to see if caffeine will have any affect of zebrafish development. We hypothesize that the caffeine treated zebrafish have a higher mortality percentage than the controlled sample. We predict that the caffeine will trigger the zebrafish's adrenaline system to activate and work overtime, in turn leading to the early death of the organism.

In this experiment, zebra fish will be introduced to a dose of caffeine in the early stages of development. We treated one sample of zebrafish with deerpark water and one sample with caffeine infused water. Every two days we removed any deceased or molded zebra fish, changed the solution out with fresh solution, fed them, and measured their growth.

DPF Average	Control	Treatment	Heart Rate	comments	Pictures Control	Pictures Treated
Day 1 2/20	Sphere 4 hr	Sphere 4 hr				
Day 4 2/23	Shield 6 hr	18- somite 17.6 hr		<u>Treatment:</u> 2 - 35 hr, 3 - 6 hr, many dead embryos <u>Control:</u> 5 - 6 hr, 1 - 42 hr		
Day 6 2/25	protruding mouth 72 hr	protruding mouth 72 hr	<u>Control:</u> 10 0 bmp <u>Treatment:</u> 160 bpm	<u>Treatment:</u> 6 live - 72 hr 1 dead - all hatched - slower swimming with nudge - still without nudge <u>Control:</u> 11 live - 72 hr 0 dead - fast with nudge - no movement without nudge		
Day 8 2/27	protruding mouth 72 hr	protruding mouth 72 hr	<u>Control:</u> 100 bpm <u>Treatment:</u> bmp 160 bpm	<u>Treatment:</u> 72 hr: 6 live, 0 dead - medium swimming with nudge, yet tails were moving faster - harder to move than control - slow without nudge <u>Control:</u> 72 hr: 6 live, 1 dead - fast with nudge - slow without nudge		
Day 10 2/29	72 hr protruding mouth	72 hr protruding mouth		<u>Treatment:</u> 5 live, 1 dead -medium swimming -minimal movement with nudge <u>Control:</u> 6 live, 0 dead - fast swimming with and without nudge		
Day 12	fully developed	fully developed	<u>Control:</u> 72 bpm <u>Treatment:</u>	<u>Treatment:</u> 3 live, missing 3... very very slow weighed down by		
			bmp 104 bpm	head <u>Control:</u> 3 live, 2 dead, 1 missing very very slow		
Day 14				<u>Treatment:</u> <u>Control:</u>		

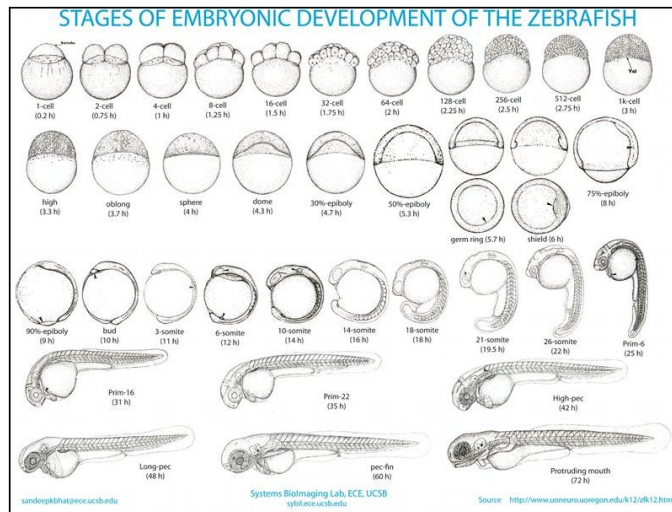


Chart used for development monitoring.

Based on the data shown above, the hypothesis can be supported. The zebrafish exposed to the caffeine experienced a higher speed and frequency percentage in mortality. This means that caffeine may have the potential for harmful affects in human growth development.