The purpose of the experiment was to see if different concentrations of cAMP, another biochemical involved in the HPI-axis, and concentrations of ACTH and cortisol elicited different levels of cortisol production. We believed that at higher [ACTH], more cortisol would be produced.

The data regarding cAMP implicated that concentrations diminish quite quickly after stimulation. (Mommsen et al, 1998) The results showed that using different concentrations of ACTH to stimulate the interrenal cells produced no significant differences in cortisol production. Between 0.5 and 1 IU/mL, there was a trend showing increased production at the higher concentration. (see Figure 1). At the higher concentrations (1, 2, 10 IU/mL), there was a trend showing decreased production at higher concentrations. (see Figure 2). None of the differences were statistically significant at p=0.05.

The data presented in this experiment will be used create and alter protocols that will be used in further experiments. Knowing how much ACTH to use, and when we should take concentration readings will allow us to alter and confidently quantify other variables. We conclude that 1 IU/mL is an adequate concentration of ACTH to use to stimulate interrenal cells. If testing for cAMP levels, the optimal time to measure at would be ten minutes post-stimulation, but those results do slightly, but not drastically. In the cortisol experiments, it could be that 1 IU/mL is simply the most ACTH a cell can process. We could hypothesize that higher doses are toxic to these cells, as cortisol production decreased above 1 IU/mL. Cell death would explain the apparent drop in cortisol production.

The data regarding cAMP implicated that concentrations diminish quite quickly after stimulation. This is consistent with known fact, as cAMP is degraded quickly by enzymes, so its presence could only be detected for a short period after stimulation. (Mommsen et al, 1998)

The data presented in this experiment will be used create and alter protocols that will be used in further experiments. Knowing how much ACTH to use, and when we should take concentration readings will allow us to alter and confidently quantify other variables. We conclude that 1 IU/mL is an adequate concentration of ACTH to use to stimulate interrenal cells. If testing for cAMP levels, the optimal time to measure at would be ten minutes post-stimulation, but those results are preliminary; a larger n number is needed.

Do the interrenal cells show a dose-dependent response to ACTH? It appears that they do slightly, but not drastically. In the cortisol experiments, it could be that 1 IU/mL is simply the most ACTH a cell can process. We could hypothesize that higher doses are toxic to these cells, as cortisol production decreased above 1 IU/mL. Cell death would explain the apparent drop in cortisol production.

The results obtained from the cAMP work showed a trend of decreasing concentrations with time (see Figure 3). However, we can not say with any confidence that this is conclusive, as the n number is so low for this data (n=2).

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References
