The current FET test protocol does not include endpoints that allow for the prediction of sublethal adverse effects, and there have been no significant differences reported for heart rate in any of the sodium chloride treatment groups (Fig. 8).

Significant differences were detected in heart rate between 3,4-DCA treatment groups at 76 hpf (Fig. 8). There was a significant difference in the sodium chloride treatment groups, but post-hoc testing was unable to identify which groups were different (Fig. 10).

**Conclusions and Future Directions**

- Gene expression showed the least promise. Significant alterations were only seen in one of the four genes targeted, and then only in response to one of the chemicals.
- Pericardial area showed the most promise for improving the sensitivity of the FET test. It was significantly increased in three of the four chemicals tested, and in three out of the four chemicals it demonstrated a dose-dependent trend. Further research is needed to establish what the long-term adverse impacts of odema are on the health of fish.
- Heart rate was less sensitive than pericardial area, but more sensitive than gene expression. Significant alterations were seen in two of the four chemicals.

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