Central CO₂/pH Chemosensitivity Influence on Respiration in both Early and Late Staged Tadpoles

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Abstract

We test the hypothesis that central respiratory CO₂/pH chemosensitivity, recorded from isolated brainstems, remains consistent throughout tadpole development. Results indicate that tadpoles at all developmental stages respond to CO₂/pH, and that the sensitivity of these responses does not change with development.

Introduction

As the tadpole develops into a frog, arterial pH decreases (acidosis) due to an accumulation of CO₂ associated with the transition from aquatic to terrestrial environments. This study aims to determine consistency or change in CO₂/pH sensitivity over development.

With tadpole development lung ventilation increases, and eventually replaces gill (buccal) respiration as the primary mechanism for gas exchange.

Potential transitions in CO₂/pH sensitivity are inconclusive.

Methods

Tadpole brain stems where isolated en bloc and transferred to a recording superfusion chamber (Fig 2.) where activities of nerves normally controlling ventilation were recorded generating neurograms (Fig 3.)

Results

This study demonstrates that isolated brain stems exposed to various CO₂ concentrations generated a fictive respiratory response, and that the sensitivity of this remains consistent throughout tadpole development.

Discussion

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References

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