Is plasma cortisol response to stress in rainbow trout regulated by catecholamine-induced hyperglycemia?

Based on previous studies we hypothesize that under stress conditions catecholamine-induced hyperglycemia contributes to enhance cortisol production in head kidney of rainbow trout. Therefore, treatment with propranolol (beta(-)-adrenoceptor blocker) should reduce the hyperglycemia elicited by stress and, therefore, we expected reduced glucosensing response and cortisol production in head kidney. Propranolol treatment was effective in blocking most of the effects of catecholamines in liver energy metabolism resulting in a lower glycemia in stressed fish. The decreased glycemia of stressed fish treated with propranolol was observed along with reduced transcription of genes involved in the cortisol synthetic pathway, which supports our hypothesis. However, changes in putative glucosensing parameters assessed in head kidney were scarce and in general did not follow changes noted in glucose levels in plasma. Furthermore, circulating cortisol levels did not change in parallel with changes in glycemia. As a whole, the present results suggest that glycemia could participate in the regulation of cortisol synthetic pathways but other factors are also likely involved. Propranolol effects on trout stress response were different depending on time passed after stress onset; the direct or indirect involvement of catecholaminergic response in the regulation of cortisol production and release deserves further investigation. (C) 2014 Elsevier Inc. All rights reserved.
Scopus rating (2008): SJR 0.939 SNIP 1.159
Scopus rating (2007): SJR 0.791 SNIP 1
Scopus rating (2006): SJR 0.657 SNIP 0.83
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 0.764 SNIP 0.924
Scopus rating (2004): SJR 0.705 SNIP 0.951
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 0.505 SNIP 0.674
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 0.458 SNIP 0.771
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 0.589 SNIP 0.945
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 0.586 SNIP 0.756
Scopus rating (1999): SJR 0.575 SNIP 0.77

Original language: English

DOIs: 10.1016/j.ygcen.2014.04.002
Source: FindIt
Source-ID: 266803175
Publication: Research - peer-review › Journal article – Annual report year: 2014