Is plasma cortisol response to stress in rainbow trout regulated by catecholamine-induced hyperglycemia? - DTU Orbit (03/11/2019)

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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.

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