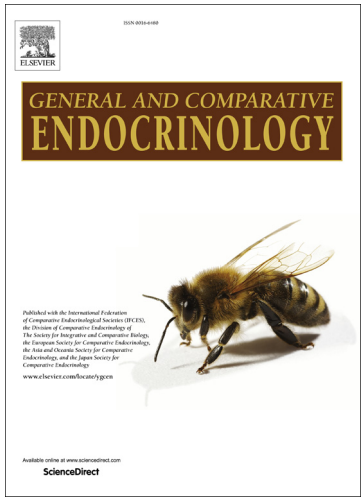

Different regulation of insulin on glucose and lipid metabolism in 2 strains of gibel carp

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Different regulation of insulin on glucose and lipid metabolism in 2 strains of gibel carp

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Abstract

To test the hypothesis that response to insulin by regulating glucose and lipid metabolism in gibel carp A strain may be different from that in DT strain, bovine insulin was injected into both strains of gibel carp after previous fasting for 48 h. The results showed that insulin induced hypoglycemia at 3 h in 2 strains, and that this was coupled with increased expression of glucose transporters (GLUT2 in the liver and GLUT1, GLUT4 in the muscle) and glycolytic enzyme (HK2 in the muscle) in both strains. Insulin induced increased glycolysis (GK) and fatty acid oxidation (ACO3 in the liver and CPT1a, ACO3 in the muscle) in the DT strain. Conversely, very strong lipogenic capacity, as indicated by higher mRNA levels of transcription factor of fatty acid anabolism (SREBP1) and lipogenic enzymes (ACC, ACLY, and FAS) and decrease lipolytic capacity as indicated by lower mRNA levels of fatty acid oxidation enzymes in the liver (ACO3) and muscle (CPT1a and ACO3) detected in the A strain after insulin injection. Higher plasma insulin levels and decreased plasma free fatty acid levels were detected at 8 h post insulin injection in A strain induced hypoglycemia. However, plasma glucose levels returned to baseline and no effect on fatty acid levels in the DT strain was observed in response to insulin treatment at the same point in time. These insulin-strain interactions demonstrated that insulin induced different changes in glucose and lipid metabolism in these 2 strains as expected.