

Compensatory Increased Activities of Mitochondrial Respiratory Chain Complexes from Eyes of Glucose-Immersed Zebrafish

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Abstract : Diabetes is a metabolic disease characterized by hyperglycemia, insulin resistant, mitochondrial dysfunction. Diabetes is associated with the development of diabetic retinopathy resulting in worsening vision and eventual blindness. In this study, eyes were enucleated from glucose-immersed zebrafish which is a good animal model to generate diabetes, and then mitochondria were isolated to evaluate activities of mitochondrial electron transfer complexes. Surprisingly, the amount of isolated mitochondria was increased in eyes from glucose-immersed zebrafish compared to those from non-glucose-immersed zebrafish. Spectrophotometric analysis for measuring activities of mitochondrial complex I, II, III, and IV revealed that mitochondria functions was even enhanced in eyes from glucose-immersed zebrafish. These results indicated that 3 days or 7 days glucose-immersion on zebrafish to induce diabetes might contribute metabolic compensatory mechanism to restore their mitochondrial homeostasis on the early stage of diabetes in eyes.

Keywords : diabetes, glucose immersion, mitochondrial complexes, zebrafish

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