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Lipid Metabolism

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ABSTRACT

Perilipin 2, also known as Adipose differentiation-relation protein or PLIN2, is a lipid droplet-binding protein present in almost every tissue. The absence of PLIN2 upregulates hepatic very low-density lipoprotein secretion, relieves hepatosteatosis, and improves whole body insulin resistance in mice. Despite of the importance in mediating lipid metabolism, the regulation of PLIN2 itself remains largely unknown. Previous reports have shown that X-box binding protein 1 (XBP1) is an important regulator of lipogenesis. XBP1 is a transcription factor that recognizes and binds to a consensus sequence, 5'-TGACGTGG-3'. Interestingly, when we looked through the promoter region of mouse *Plin2* gene, we found that the consensus sequence is present in the *Plin2* promoter. Therefore, we hypothesize that XBP1 might directly bind to *Plin2* promoter and regulate the *Plin2* expression.

To test our hypothesis, we will perform the luciferase assay to examine whether the *Plin2* promoter activity is regulated by XBP1. We first designed forward and reverse PCR primers, which include BglII and BamHI restriction enzyme sites respectively, to amplify the *Plin2* promoter region (from -1100 to +40). We performed PCR and cloned the *Plin2* promoter to a TA vector. The TA vector was then sequenced to exclude any point mutations. After sequencing, we sub cloned the *Plin2* promoter into a vector containing a luciferase reporter. In the future, we will transfect 293T, a human embryonic kidney cell line, with the *Plin2* promoter-luciferase vector we generated. We will compare the *Plin2* promoter activity by measuring the luminescence in the presence or absence of XBP1.

Key words: Plin2, XBP1, Consensus Sequence, Luciferase Assay

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