

S60-4 Sterol-mediated Regulation of Human Lipin 1 Gene Expression

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Lipin 1 plays a crucial role in lipid metabolism in adipose tissue, skeletal muscle, and liver. Its physiological role involves two cellular functions: regulation of phosphatidate phosphatase activity and regulation of fatty acid oxidation. In this study, we have demonstrated that lipin 1 gene (*LPINI*) expression is regulated by cellular sterols, which are key regulators of lipid metabolism. We have also characterized the sterol-response element and nuclear factor Y-binding sites in the human *LPINI* promoter. Using a luciferase assay, electrophoretic mobility shift assay, and chromatin immunoprecipitation assay, we demonstrated that these elements are responsible for the transcription of *LPINI* gene, mediated by SREBP-1 (sterol regulatory element-binding protein 1) and nuclear factor Y. Furthermore, we investigated whether lipin 1 is involved in lipogenesis by transfection of *LPINI* small interfering RNA. We infer that sterol-mediated regulation of lipin 1 gene transcription modulates triglyceride accumulation. This modulation involves changes in the activity of phosphatidate phosphatase.