P002 Dietary fish oil influences the expression of hepatic nuclear factor α and related genes

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Hepatic nuclear factor 4α (HNF4α) is a transcription factor which controls the expression of key genes regulating hepatic lipid metabolism. Dietary n-3 polyunsaturated fatty acids (PUFA) found in fish oil reduce plasma triglyceride (TG) levels by inhibiting liver VLDL secretion, but the role of HNF4α in mediating this effect is not known. In this study, the acute and chronic effects of dietary fish oil on the expression of mRNA for HNF4α and its target genes were investigated. In rat hepatocytes exposed to chylomicron remnants derived from fish oil, HNF4α mRNA expression was decreased. Feeding rats a diet containing fish oil for 4 weeks, on the other hand, caused a marked rise in the levels of mRNA for HNF4α and its target gene HNF1α, although the abundance of transcripts for other target genes including microsomal triglyceride transfer protein and apolipoprotein B was not signficantly changed. These results indicate that dietary fish oil n-3 PUFA modulate the expression of mRNA for HNF4α in different ways in the short and the long term, and suggest that HNF4α may play a part in the mediation of the effects of n-3 PUFA on VLDL secretion.