Table S.5: **Results of Separate Association Analysis of Lipid Traits in the Individual European Studies in the Regions of *APOE* and *LDLR* Genes Using the F-distributed Statistics.** The associations that attain a threshold significance of $P < 3.1\times10^{-6}$ are marked by red (Liu *et al.* 2014). The results of "Basis of both GVF and $\beta(t)$" were based on smoothing both GVF and genetic effect functions $\beta(t)$ of fixed effect model, the results of "Basis of beta-Smooth Only" were based on beta-smooth only model (Fan *et al.* 2013), the results of "Additive Model (6)" were based on the additive effect model (6) to analyze study by study (i.e., $L = 1$), and the p-values of SKAT-O Were Based of R Package SKAT. Abbreviation: GVF = Genetic Variant Function.

Study	Gene	Traits	P-values of the F-distributed Statistics					P-values of SKAT-O
			Basis of both GVF and $\beta(t)$		Basis of beta-Smooth Only		Additive Model (6)	
			B-spline Basis	Fourier Basis	B-spline Basis	Fourier Basis		
D2d-2007	APOE	LDL	1.89×10^{-25}	9.02×10^{-25}	1.89×10^{-25}	9.02×10^{-25}	2.85×10^{-24}	5.87×10^{-13}
		CHOL	9.09×10^{-18}	3.01×10^{-17}	9.09×10^{-18}	3.01×10^{-17}	7.97×10^{-17}	1.72×10^{-9}
FUSION Stage 2	APOE	LDL	4.34×10^{-10}	2.24×10^{-11}	4.34×10^{-10}	2.24×10^{-11}	3.42×10^{-11}	8.61×10^{-14}
		CHOL	1.34×10^{-12}	4.92×10^{-13}	1.34×10^{-12}	4.92×10^{-13}	8.70×10^{-13}	1.64×10^{-12}
Norway	APOE	LDL	3.79×10^{-28}	1.90×10^{-27}	3.79×10^{-28}	1.90×10^{-27}	6.05×10^{-27}	6.21×10^{-6}
		CHOL	2.12×10^{-14}	6.15×10^{-14}	2.12×10^{-14}	6.15×10^{-14}	1.35×10^{-13}	3.00×10^{-3}
DIAGEN	APOE	LDL	7.84×10^{-7}	3.31×10^{-6}	7.84×10^{-7}	3.31×10^{-6}	5.76×10^{-6}	2.37×10^{-1}
METSIM	APOE	LDL	1.85×10^{-5}	1.98×10^{-5}	1.85×10^{-5}	1.98×10^{-5}	3.45×10^{-5}	1.25×10^{-4}
	LDLR	CHOL	3.47×10^{-4}	2.97×10^{-6}	3.47×10^{-4}	2.97×10^{-6}	5.67×10^{-6}	5.79×10^{-3}