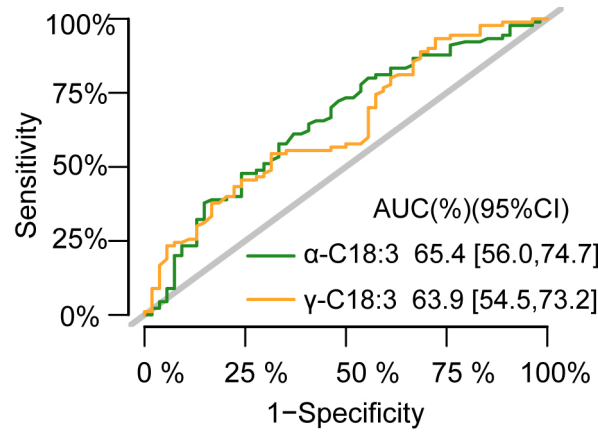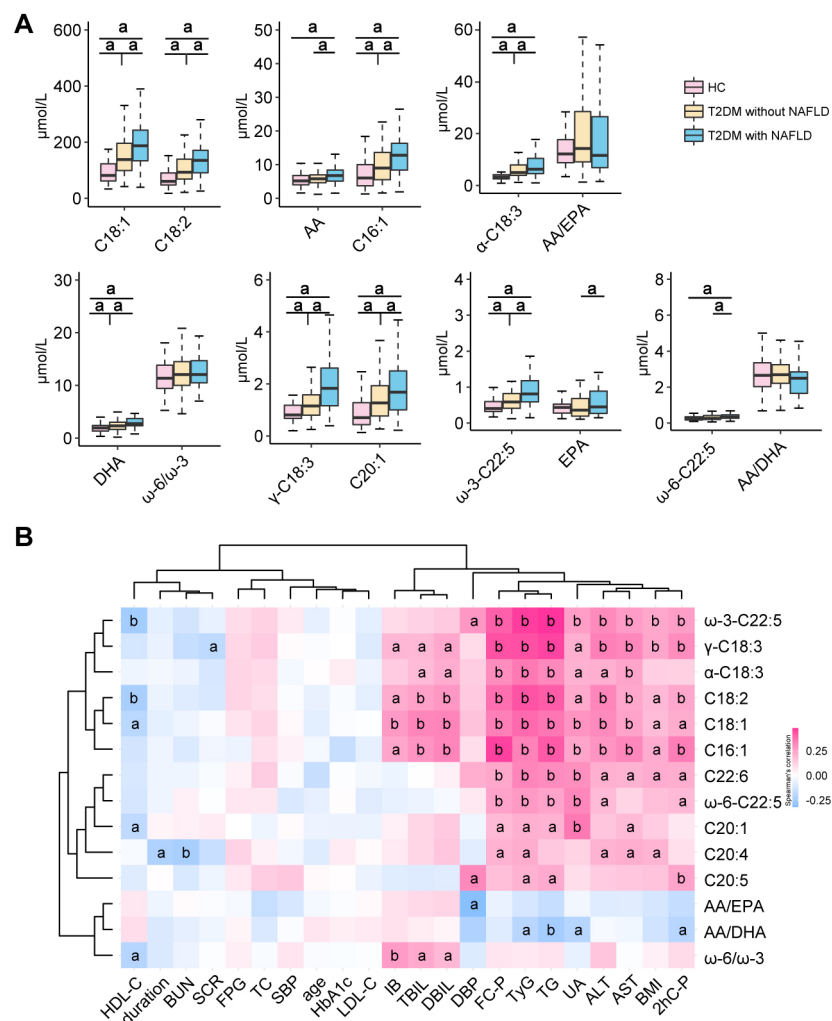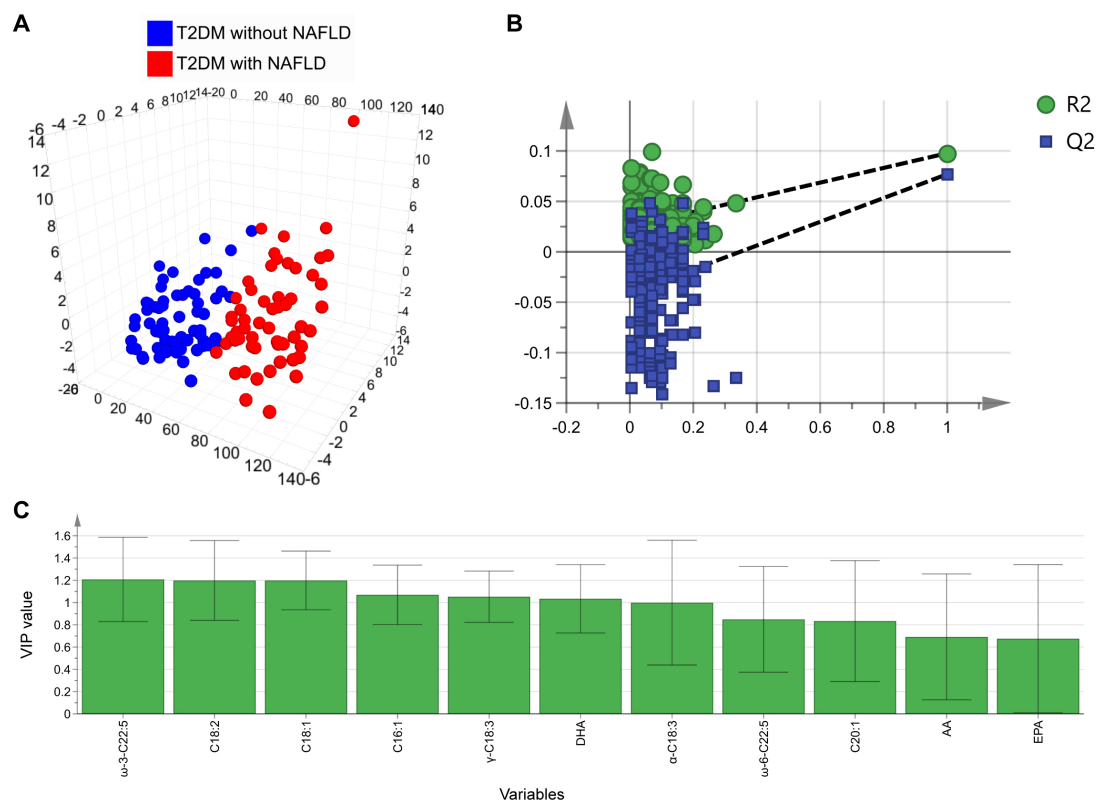**Supplementary Figure 1 Bile acids (BAs) and unsaturated fatty acids (UFAs) distribution among Healthy Control (HC), type 2 diabetes mellitus (T2DM) without nonalcoholic fatty liver disease (NAFLD), and T2DM with NAFLD. Clustering analysis of serum BAs and UFAs levels.** A: Serum levels of UFAs in three groups. Wilcoxon test ([a] $P < 0.05$); B: Serum levels of BAs in three groups. Wilcoxon test ([a] $P < 0.05$); C: Spearman's correlation analysis between BAs and UFAs ([a] $P < 0.05$, [b] $P < 0.01$); D: Spearman's correlation analysis between UFAs and clinical indicators T2DM with or without NAFLD (* $P < 0.05$, + $P < 0.01$).

Supplementary Figure 2 Receiver operating characteristic curve (ROC) analysis of γ-linolenic acid (γ-C18:3, GLA)) and α-linolenic acid (α-C18:3, ALA) in predicting clinically significant fibrosis in nonalcoholic fatty liver disease.
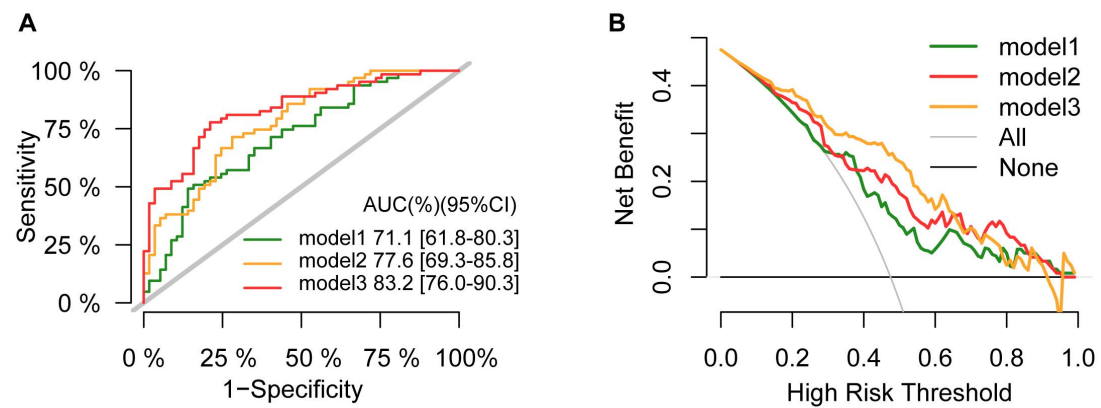
Supplementary Figure 3 Bile acids (BAs) and unsaturated fatty acids (UFAs) distribution among Healthy Control (HC), type 2 diabetes mellitus (T2DM) without nonalcoholic fatty liver disease (NAFLD), and T2DM with NAFLD. A: Clustering analysis of serum UFAs levels. Serum levels of UFAs in three groups. Wilcoxon test ([a] $P <$ 0.05); B: Spearman's correlation analysis between UFAs and clinical indicators in T2DM with or without NAFLD ([a] $P < 0.05$, [b] $P < 0.01$).

Supplementary Figure 4 Multivariate analysis of unsaturated fatty acids in orthogonal partial least squares-discriminant analysis (OPLS-DA) model in validation cohort. A: OPLS−DA 3D model between T2DM with or without NAFLD groups. $R^2X = 0.597$, $R^2Y = 0.098$, and $Q^2Y = 0.077$; B: The 200−permutation test demonstrated no overfitting in the OPLS-DA model [$Q^2 = (0.0, -0.041)$, $R^2 = (0, 0.025)$]; C: The contribution of the metabolite

to distinguishT2DM with or without NAFLD is indicated by variable influence on

projection (VIP) values.

Supplementary Figure 5 Logistic regression risk prediction model about non-alcoholic fatty liver disease (NAFLD) in type 2 diabetes mellitus (T2DM) of validation cohort. A: Comparison of three predictive model assessments of the 95% CI of their AUC values; B: Comparison of model performance from Decision Curve analysis.