Supplementary Method

Permutation test of area under the curve

We performed permutation test of area under the curve (AUC) of clinic-genetic model in obese group to identify whether the AUC is valid or not. First, we permutated diabetes status of obese group and estimated AUC of the data with the permutated disease status 1,000 times. Second, we randomly sampled the same number of obese group from normal and overweight group, and permutated diabetes status. The $P$ value of the permutation test is

$$p = \frac{n(\text{permAUC} > \text{oriAUC})}{n_{\text{Perm}}}$$

where $\text{permAUC}$ is a AUC with permutated diabetes status, and $\text{oriAUC}$ is AUC of clinico-genetic model in obese group. $n()$ is number of $\text{permAUC} > \text{oriAUC}$, and $n_{\text{Perm}}$ is number of permutation (1,000).