

**File name: Supplementary Data 1**

**Description:** List of traits in PhenomeXcan, with information about trait code, description, type (binary, categorical, continuous, ordinal), sample size, number of cases, number of controls, and study source.

**File name: Supplementary Data 2**

**Description:** Archive containing two files about the CRISPR-Cas9 screening on lipid regulation: 1) a list of 462 differentially expressed genes, their effect on lipids (decrease or increase), and rank, and 2) information about the ranking criteria for genes.

**File name: Supplementary Data 3**

**Description:** Clustering partition with  $k=16$  groups of 3,752 traits from PhenomeXcan projected into the latent space (with 987 latent variables).

**File name: Supplementary Data 4**

**Description:** Clustering partition with  $k=22$  groups of 3,752 traits from PhenomeXcan projected into the latent space (with 987 latent variables).

**File name: Supplementary Data 5**

**Description:** Clustering partition with  $k=25$  groups of 3,752 traits from PhenomeXcan projected into the latent space (with 987 latent variables).

**File name: Supplementary Data 6**

**Description:** Clustering partition with  $k=26$  groups of 3,752 traits from PhenomeXcan projected into the latent space (with 987 latent variables).

**File name: Supplementary Data 7**

**Description:** Clustering partition with  $k=29$  groups of 3,752 traits from PhenomeXcan projected into the latent space (with 987 latent variables).

**File name: Supplementary Data 8**

**Description:** Readable format of primer sequences for generating Illumina libraries.