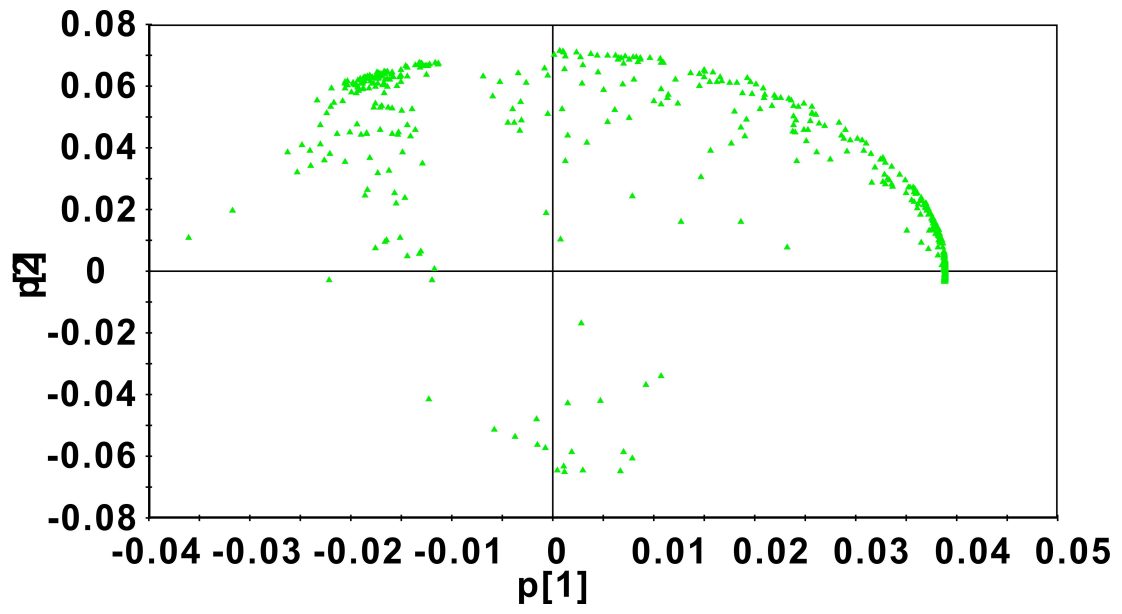


## Supplementary Information

**Table S5** Basic annotations of biomarkers from MetaboAnalyst

No.	Query	Match	HMDB	PubChem	KEGG	Enzymes	Transporters
1	n-Butyrate	Butyric acid	HMDB00039	264	C00246	17	1
2	Deoxycholate	Deoxycholic acid	HMDB00626	222528	C04483	2	8
3	Leucine	L-Leucine	HMDB00687	6106	C00123	7	1
4	Valine	L-Valine	HMDB00883	6287	C00183	6	1
5	Propionate	Propionic acid	HMDB00237	1032	C00163	5	—
6	3-Hydroxybutyrate	3-Hydroxybutyric acid	HMDB00357	441	C01089	4	—
7	Isoleucine	L-Isoleucine	HMDB00172	6306	C00407	6	1
8	Lactate	L-Lactic acid	HMDB00190	107689	C00186	5	—
9	Alanine	L-Alanine	HMDB00161	5950	C00041	21	4
10	Citrulline	Citrulline	HMDB00904	9750	C00327	14	—
11	Lysine	L-Lysine	HMDB00182	5962	C00047	25	—
12	Acetate	Acetic acid	HMDB00042	176	C00033	41	2
13	Glutamate	D-Glutamic acid	HMDB03339	23327	C00217	2	—
14	Succinate	Succinic acid	HMDB00254	1110	C00042	44	—
15	Dimethylamine	Dimethylamine	HMDB00087	674	C00543	4	—
16	Trimethylamine	Trimethylamine	HMDB00906	1146	C00565	5	—
17	Creatinine	Creatinine	HMDB00562	588	C00791	—	—
18	Phenylalanine	L-Phenylalanine	HMDB00159	6140	C00079	19	2
19	Tryptophan	L-Tryptophan	HMDB00929	6305	C00078	11	2
20	$\alpha$ -Glucose	D-Glucose	HMDB00122	5793	C00031	29	—
21	Glycerol	Glycerol	HMDB00131	753	C00116	42	1
22	Taurine	Taurine	HMDB00251	1123	C00245	11	—

Figure S1 Loading plot from PCA model among control group, T2DN group and treated group.



**Figure S2** Permutation test plots (200 permutations) for fecal extracts: (A) control group *VS* T2DN group; (B) T2DN group *VS* treated group.

