Table 3a. Statistics, Demographics for the 2015 Jackson County Jail Inmate Population, 1/1/2015 - 12/31/2015

Inmate Id	Gender	Race	Age	Jail Days	Charge Count	Felony Charge Count	Misdemeanor Charge Count	Violent Charge Count	Drug Charge Count	Property Charge Count	Public Order Charge Count	Traffic Charge Count	Other Charge Count
1000001	M	Black	25-34	1	1	0	1	0	0	0	0	0	1
1000002	M	White	35-44	1	1	0	1	0	0	0	0	0	1
1000003	M	White	35-44	1	1	0	1	0	0	0	0	0	1
1000004	M	White	35-44	1	1	0	1	0	0	0	0	0	1

Table S2. Mendelian Randomization estimation for metabolites on the risk of Familial hypercholesterolemia. (n=30)

Outcome	Traits	Exposure	Methods	nsnp	Beta	Se	Low	Up	*P*	OR	OR_lowCI95	OR_upCI95	Pleiotropy test			Heterogeneity test			MR-PRESSO (raw)	
													egger_intercept	Se	*P*	Q	Q_df	Q_pval	RSSobs	P
Familial hypercholesterolemia	GCST90199642	Ribitol levels	MR Egger	27.000	0.046	0.041	-0.035	0.127	0.278	1.047	0.965	1.136				19.736	25.000	0.761		
			Weighted median	27.000	0.030	0.041	-0.049	0.110	0.454	1.031	0.952	1.116								
			Inverse variance weighted	27.000	0.060	0.030	0.001	0.119	0.045	1.062	1.001	1.126				19.982	26.000	0.792		
			Simple mode	27.000	0.037	0.075	-0.109	0.184	0.622	1.038	0.897	1.202								
			Weighted mode	27.000	0.044	0.037	-0.029	0.116	0.249	1.045	0.972	1.123								
			MR-Egger (intercept)										0.005	0.010	0.624					
			MR-PRESSO (raw)																21.016	0.804
Familial hypercholesterolemia	GCST90199766	3-(3-amino-3-carboxypropyl)uridine levels	MR Egger	9.000	-0.123	0.191	-0.498	0.251	0.539	0.884	0.608	1.285				4.714	7.000	0.695		
			Weighted median	9.000	-0.164	0.128	-0.414	0.086	0.199	0.849	0.661	1.090								
			Inverse variance weighted	9.000	-0.216	0.098	-0.408	-0.023	0.028	0.806	0.665	0.977				5.031	8.000	0.754		
			Simple mode	9.000	-0.174	0.180	-0.528	0.180	0.363	0.840	0.590	1.197								
			Weighted mode	9.000	-0.163	0.162	-0.480	0.154	0.344	0.850	0.619	1.167								
			MR-Egger (intercept)										-0.010	0.018	0.591					
			MR-PRESSO (raw)																6.268	0.784
Familial hypercholesterolemia	GCST90199768	Phenylacetylglutamine levels	MR Egger	16.000	0.101	0.171	-0.234	0.435	0.564	1.106	0.792	1.546				12.928	14.000	0.532		
			Weighted median	16.000	0.202	0.111	-0.015	0.419	0.068	1.224	0.985	1.521								
			Inverse variance weighted	16.000	0.189	0.079	0.034	0.343	0.017	1.208	1.035	1.409				13.263	15.000	0.582		
			Simple mode	16.000	0.109	0.179	-0.242	0.460	0.552	1.115	0.785	1.584								
			Weighted mode	16.000	0.232	0.155	-0.071	0.536	0.154	1.262	0.931	1.709								
			MR-Egger (intercept)										0.012	0.020	0.572					
			MR-PRESSO (raw)																15.044	0.602
Familial hypercholesterolemia	GCST90199773	Phenol sulfate levels	MR Egger	17.000	-0.513	0.217	-0.939	-0.088	0.032	0.598	0.391	0.916				13.984	15.000	0.527		
			Weighted median	17.000	-0.190	0.099	-0.384	0.005	0.056	0.827	0.681	1.005								
			Inverse variance weighted	17.000	-0.182	0.072	-0.323	-0.042	0.011	0.833	0.724	0.959				16.582	16.000	0.413		
			Simple mode	17.000	-0.176	0.186	-0.541	0.189	0.359	0.839	0.582	1.209								
			Weighted mode	17.000	-0.188	0.178	-0.536	0.160	0.305	0.828	0.585	1.173								
			MR-Egger (intercept)										0.035	0.022	0.128					
			MR-PRESSO (raw)																18.615	0.422
Familial hypercholesterolemia	GCST90199784	Cysteine-glutathione disulfide levels	MR Egger	20.000	-0.079	0.113	-0.300	0.143	0.495	0.924	0.741	1.153				24.066	18.000	0.153		
			Weighted median	20.000	-0.105	0.069	-0.241	0.030	0.128	0.900	0.786	1.031								
			Inverse variance weighted	20.000	-0.129	0.054	-0.234	-0.024	0.016	0.879	0.791	0.976				24.416	19.000	0.181		
			Simple mode	20.000	-0.316	0.134	-0.579	-0.052	0.030	0.729	0.560	0.949								
			Weighted mode	20.000	-0.117	0.068	-0.250	0.017	0.103	0.890	0.779	1.017								
			MR-Egger (intercept)										-0.009	0.017	0.615					
			MR-PRESSO (raw)																26.523	0.229
Familial hypercholesterolemia	GCST90199795	2-hydroxypalmitate levels	MR Egger	15.000	0.200	0.170	-0.134	0.534	0.261	1.221	0.875	1.705				15.185	13.000	0.296		
			Weighted median	15.000	0.124	0.101	-0.075	0.322	0.223	1.132	0.928	1.380								
			Inverse variance weighted	15.000	0.157	0.075	0.009	0.305	0.037	1.170	1.009	1.356				15.279	14.000	0.359		
			Simple mode	15.000	0.089	0.159	-0.222	0.400	0.584	1.093	0.801	1.492								
			Weighted mode	15.000	0.129	0.130	-0.127	0.384	0.340	1.137	0.881	1.468								
			MR-Egger (intercept)										-0.006	0.019	0.781					
			MR-PRESSO (raw)																17.055	0.389
Familial hypercholesterolemia	GCST90199829	3-methyladipate levels	MR Egger	14.000	-0.248	0.154	-0.549	0.053	0.132	0.780	0.578	1.054				9.735	12.000	0.639		
			Weighted median	14.000	-0.141	0.098	-0.332	0.050	0.148	0.868	0.717	1.051								
			Inverse variance weighted	14.000	-0.174	0.070	-0.311	-0.037	0.013	0.840	0.733	0.964				10.028	13.000	0.692		
			Simple mode	14.000	-0.108	0.167	-0.435	0.219	0.530	0.898	0.648	1.245								
			Weighted mode	14.000	-0.151	0.139	-0.423	0.121	0.296	0.860	0.655	1.128								
			MR-Egger (intercept)										0.010	0.019	0.598					
			MR-PRESSO (raw)																11.585	0.715
Familial hypercholesterolemia	GCST90200122	Nisinate (24:6n3) levels	MR Egger	17.000	0.086	0.123	-0.156	0.328	0.495	1.090	0.856	1.389				19.502	15.000	0.192		
			Weighted median	17.000	0.158	0.074	0.012	0.303	0.033	1.171	1.013	1.354								
			Inverse variance weighted	17.000	0.107	0.054	0.001	0.212	0.047	1.112	1.001	1.236				19.545	16.000	0.241		
			Simple mode	17.000	0.198	0.158	-0.112	0.507	0.229	1.218	0.894	1.660								
			Weighted mode	17.000	0.235	0.157	-0.073	0.543	0.154	1.265	0.930	1.722								
			MR-Egger (intercept)										0.004	0.020	0.858					
			MR-PRESSO (raw)																23.042	0.218
Familial hypercholesterolemia	GCST90200183	N-acetyl-2-aminooctanoate levels	MR Egger	18.000	0.058	0.059	-0.057	0.173	0.339	1.060	0.944	1.189				5.553	16.000	0.992		
			Weighted median	18.000	0.060	0.045	-0.027	0.148	0.177	1.062	0.973	1.159								
			Inverse variance weighted	18.000	0.076	0.038	0.001	0.151	0.047	1.079	1.001	1.163				5.717	17.000	0.995		
			Simple mode	18.000	0.099	0.099	-0.095	0.294	0.331	1.104	0.909	1.341								
			Weighted mode	18.000	0.063	0.046	-0.028	0.154	0.192	1.065	0.972	1.167								
			MR-Egger (intercept)										0.005	0.012	0.691					
			MR-PRESSO (raw)																6.799	0.996
Familial hypercholesterolemia	GCST90200225	3-hydroxy-2-methylpyridine sulfate levels	MR Egger	16.000	0.265	0.119	0.031	0.499	0.044	1.303	1.031	1.647				11.437	14.000	0.651		
			Weighted median	16.000	0.174	0.092	-0.006	0.354	0.059	1.190	0.994	1.424								
			Inverse variance weighted	16.000	0.164	0.064	0.038	0.289	0.010	1.178	1.039	1.336				12.437	15.000	0.646		
			Simple mode	16.000	0.139	0.134	-0.124	0.402	0.316	1.149	0.884	1.495								
			Weighted mode	16.000	0.189	0.119	-0.045	0.423	0.135	1.208	0.956	1.526								
			MR-Egger (intercept)										-0.024	0.024	0.334					
			MR-PRESSO (raw)																14.282	0.666
Familial hypercholesterolemia	GCST90200234	Picolinoylglycine levels	MR Egger	19.000	-0.212	0.139	-0.485	0.062	0.147	0.809	0.616	1.064				13.864	17.000	0.677		
			Weighted median	19.000	-0.138	0.089	-0.312	0.037	0.122	0.872	0.732	1.037								
			Inverse variance weighted	19.000	-0.150	0.065	-0.277	-0.023	0.021	0.861	0.758	0.977				14.116	18.000	0.722		
			Simple mode	19.000	-0.042	0.155	-0.346	0.262	0.790	0.959	0.708	1.299								
			Weighted mode	19.000	-0.178	0.121	-0.416	0.059	0.158	0.837	0.660	1.061								
			MR-Egger (intercept)										0.008	0.016	0.622					
			MR-PRESSO (raw)																15.458	0.766
Familial hypercholesterolemia	GCST90200324	Anthranilate levels	MR Egger	23.000	-0.105	0.057	-0.217	0.007	0.079	0.900	0.805	1.007				15.669	21.000	0.788		
			Weighted median	23.000	-0.046	0.055	-0.154	0.062	0.402	0.955	0.858	1.064								
			Inverse variance weighted	23.000	-0.083	0.038	-0.157	-0.009	0.027	0.920	0.855	0.991				15.936	22.000	0.819		
			Simple mode	23.000	-0.109	0.106	-0.318	0.099	0.316	0.897	0.728	1.104								
			Weighted mode	23.000	-0.050	0.053	-0.154	0.055	0.362	0.952	0.857	1.056								
			MR-Egger (intercept)										0.005	0.011	0.611					
			MR-PRESSO (raw)																18.390	0.840
Familial hypercholesterolemia	GCST90200352	Methylsuccinate levels	MR Egger	19.000	-0.091	0.168	-0.420	0.238	0.596	0.913	0.657	1.269				26.158	17.000	0.072		
			Weighted median	19.000	-0.051	0.097	-0.240	0.138	0.597	0.950	0.786	1.148								
			Inverse variance weighted	19.000	-0.179	0.076	-0.327	-0.030	0.018	0.836	0.721	0.970				26.690	18.000	0.085		
			Simple mode	19.000	-0.290	0.186	-0.653	0.074	0.136	0.749	0.520	1.077								
			Weighted mode	19.000	-0.062	0.126	-0.310	0.185	0.627	0.939	0.733	1.204								
			MR-Egger (intercept)										-0.012	0.020	0.564					
			MR-PRESSO (raw)																29.960	0.106
Familial hypercholesterolemia	GCST90200460	X-11372 levels	MR Egger	21.000	-0.189	0.130	-0.444	0.066	0.163	0.828	0.642	1.068				24.343	19.000	0.183		
			Weighted median	21.000	-0.132	0.087	-0.302	0.039	0.130	0.877	0.739	1.039								
			Inverse variance weighted	21.000	-0.129	0.064	-0.254	-0.003	0.044	0.879	0.775	0.997				24.709	20.000	0.213		
			Simple mode	21.000	-0.088	0.154	-0.389	0.214	0.576	0.916	0.678	1.239								
			Weighted mode	21.000	-0.129	0.118	-0.360	0.102	0.286	0.879	0.698	1.107								
			MR-Egger (intercept)										0.008	0.015	0.600					
			MR-PRESSO (raw)																27.107	0.266
Familial hypercholesterolemia	GCST90200482	GCST90200482	MR Egger	22.000	0.088	0.127	-0.161	0.338	0.496	1.092	0.851	1.402				17.872	20.000	0.596		
			Weighted median	22.000	0.118	0.091	-0.061	0.297	0.198	1.125	0.940	1.346								
			Inverse variance weighted	22.000	0.130	0.063	0.006	0.254	0.039	1.139	1.006	1.289				18.013	21.000	0.648		
			Simple mode	22.000	0.240	0.170	-0.093	0.573	0.172	1.271	0.912	1.773								
			Weighted mode	22.000	0.269	0.179	-0.081	0.619	0.147	1.308	0.922	1.857								
			MR-Egger (intercept)										0.006	0.016	0.711					
			MR-PRESSO (raw)																20.010	0.657
Familial hypercholesterolemia	GCST90200487	X-11880 levels	MR Egger	13.000	-0.302	0.207	-0.707	0.103	0.172	0.740	0.493	1.109				18.886	11.000	0.063		
			Weighted median	13.000	-0.151	0.100	-0.348	0.045	0.131	0.860	0.706	1.046								
			Inverse variance weighted	13.000	-0.188	0.092	-0.367	-0.008	0.041	0.829	0.693	0.992				19.546	12.000	0.076		
			Simple mode	13.000	-0.134	0.139	-0.406	0.139	0.356	0.875	0.666	1.149								
			Weighted mode	13.000	-0.134	0.121	-0.371	0.104	0.293	0.875	0.690	1.110								
			MR-Egger (intercept)										0.017	0.028	0.548					
			MR-PRESSO (raw)																21.768	0.113
Familial hypercholesterolemia	GCST90200558	X-18888 levels	MR Egger	23.000	-0.110	0.083	-0.272	0.052	0.198	0.896	0.762	1.053				23.748	21.000	0.305		
			Weighted median	23.000	-0.078	0.064	-0.204	0.047	0.222	0.925	0.815	1.049								
			Inverse variance weighted	23.000	-0.093	0.047	-0.185	-0.001	0.048	0.911	0.831	0.999				23.819	22.000	0.357		
			Simple mode	23.000	-0.041	0.107	-0.250	0.168	0.705	0.960	0.779	1.183								
			Weighted mode	23.000	-0.034	0.074	-0.180	0.112	0.652	0.967	0.836	1.118								
			MR-Egger (intercept)										0.004	0.014	0.805					
			MR-PRESSO (raw)																25.732	0.390
Familial hypercholesterolemia	GCST90200559	X-18901 levels	MR Egger	23.000	0.105	0.091	-0.074	0.284	0.265	1.110	0.928	1.328				20.962	21.000	0.461		
			Weighted median	23.000	0.128	0.074	-0.016	0.273	0.081	1.137	0.984	1.313								
			Inverse variance weighted	23.000	0.112	0.052	0.010	0.214	0.032	1.119	1.010	1.239				20.971	22.000	0.523		
			Simple mode	23.000	0.216	0.144	-0.066	0.497	0.147	1.241	0.936	1.644								
			Weighted mode	23.000	0.181	0.115	-0.045	0.406	0.131	1.198	0.956	1.501								
			MR-Egger (intercept)										0.001	0.012	0.924					
			MR-PRESSO (raw)																23.193	0.527
Familial hypercholesterolemia	GCST90200597	X-22834 levels	MR Egger	17.000	-0.374	0.185	-0.735	-0.012	0.061	0.688	0.479	0.988				21.594	15.000	0.119		
			Weighted median	17.000	-0.113	0.088	-0.287	0.060	0.201	0.893	0.751	1.062								
			Inverse variance weighted	17.000	-0.199	0.072	-0.340	-0.058	0.006	0.820	0.712	0.944				23.119	16.000	0.111		
			Simple mode	17.000	-0.077	0.162	-0.395	0.241	0.642	0.926	0.674	1.273								
			Weighted mode	17.000	-0.104	0.138	-0.375	0.167	0.462	0.901	0.687	1.181								
			MR-Egger (intercept)										0.023	0.022	0.320					
			MR-PRESSO (raw)																27.138	0.131
Familial hypercholesterolemia	GCST90200672	X-26054 levels	MR Egger	27.000	-0.021	0.057	-0.132	0.090	0.713	0.979	0.876	1.094				17.815	25.000	0.850		
			Weighted median	27.000	-0.059	0.048	-0.153	0.035	0.218	0.943	0.858	1.036								
			Inverse variance weighted	27.000	-0.089	0.035	-0.158	-0.020	0.012	0.915	0.853	0.980				20.183	26.000	0.783		
			Simple mode	27.000	-0.064	0.096	-0.253	0.124	0.509	0.938	0.776	1.132								
			Weighted mode	27.000	-0.064	0.045	-0.152	0.023	0.160	0.938	0.859	1.023								
			MR-Egger (intercept)										-0.015	0.010	0.136					
			MR-PRESSO (raw)																21.969	0.780
Familial hypercholesterolemia	GCST90200675	N-acetyltyrosine levels	MR Egger	25.000	0.023	0.048	-0.071	0.118	0.630	1.024	0.932	1.125				12.626	23.000	0.960		
			Weighted median	25.000	0.051	0.039	-0.026	0.128	0.194	1.052	0.974	1.137								
			Inverse variance weighted	25.000	0.063	0.032	0.001	0.126	0.046	1.065	1.001	1.134				13.852	24.000	0.950		
			Simple mode	25.000	0.064	0.090	-0.113	0.241	0.485	1.066	0.893	1.272								
			Weighted mode	25.000	0.054	0.037	-0.017	0.126	0.151	1.056	0.983	1.134								
			MR-Egger (intercept)										0.012	0.010	0.280					
			MR-PRESSO (raw)																14.861	0.958
Familial hypercholesterolemia	GCST90200736	Adenosine 5'-diphosphate (ADP) to arginine ratio	MR Egger	19.000	0.135	0.063	0.011	0.258	0.048	1.144	1.011	1.295				19.281	17.000	0.313		
			Weighted median	19.000	0.115	0.055	0.007	0.222	0.037	1.121	1.007	1.249								
			Inverse variance weighted	19.000	0.087	0.041	0.006	0.168	0.035	1.091	1.006	1.182				20.408	18.000	0.310		
			Simple mode	19.000	0.101	0.093	-0.082	0.284	0.294	1.106	0.921	1.329								
			Weighted mode	19.000	0.118	0.058	0.005	0.231	0.056	1.125	1.005	1.260								
			MR-Egger (intercept)										-0.014	0.015	0.333					
			MR-PRESSO (raw)																21.750	0.378
Familial hypercholesterolemia	GCST90200748	Aspartate to glutamate ratio	MR Egger	19.000	-0.180	0.129	-0.433	0.073	0.180	0.835	0.649	1.075				11.873	17.000	0.808		
			Weighted median	19.000	-0.114	0.083	-0.277	0.049	0.170	0.892	0.758	1.050								
			Inverse variance weighted	19.000	-0.161	0.059	-0.277	-0.045	0.006	0.851	0.758	0.956				11.901	18.000	0.852		
			Simple mode	19.000	-0.088	0.119	-0.321	0.144	0.465	0.915	0.726	1.155								
			Weighted mode	19.000	-0.102	0.097	-0.292	0.089	0.311	0.903	0.747	1.093								
			MR-Egger (intercept)										0.002	0.015	0.868					
			MR-PRESSO (raw)																13.009	0.885
Familial hypercholesterolemia	GCST90200754	Sphingosine to phosphate ratio	MR Egger	13.000	-0.117	0.240	-0.588	0.353	0.634	0.889	0.556	1.423				12.449	11.000	0.331		
			Weighted median	13.000	-0.314	0.106	-0.521	-0.107	0.003	0.730	0.594	0.898								
			Inverse variance weighted	13.000	-0.165	0.077	-0.315	-0.015	0.031	0.848	0.730	0.985				12.499	12.000	0.406		
			Simple mode	13.000	-0.340	0.201	-0.734	0.055	0.118	0.712	0.480	1.057								
			Weighted mode	13.000	-0.349	0.164	-0.671	-0.027	0.055	0.705	0.511	0.973								
			MR-Egger (intercept)										-0.006	0.027	0.838					
			MR-PRESSO (raw)																15.483	0.370
Familial hypercholesterolemia	GCST90200803	Spermidine to phosphate ratio	MR Egger	18.000	-0.080	0.109	-0.293	0.133	0.474	0.923	0.746	1.143				14.357	16.000	0.572		
			Weighted median	18.000	-0.131	0.086	-0.298	0.037	0.127	0.878	0.742	1.038								
			Inverse variance weighted	18.000	-0.165	0.059	-0.280	-0.050	0.005	0.848	0.755	0.951				15.226	17.000	0.579		
			Simple mode	18.000	-0.100	0.142	-0.378	0.179	0.493	0.905	0.685	1.196								
			Weighted mode	18.000	-0.113	0.127	-0.362	0.137	0.388	0.893	0.696	1.146								
			MR-Egger (intercept)										-0.014	0.015	0.365					
			MR-PRESSO (raw)																17.108	0.593
Familial hypercholesterolemia	GCST90200821	Adenosine 5'-diphosphate (ADP) to glycine ratio	MR Egger	23.000	0.075	0.071	-0.065	0.215	0.304	1.078	0.937	1.240				15.031	21.000	0.821		
			Weighted median	23.000	0.115	0.057	0.004	0.226	0.041	1.122	1.005	1.254								
			Inverse variance weighted	23.000	0.087	0.038	0.012	0.161	0.022	1.091	1.012	1.175				15.067	22.000	0.859		
			Simple mode	23.000	0.067	0.084	-0.097	0.232	0.431	1.070	0.907	1.261								
			Weighted mode	23.000	0.107	0.066	-0.022	0.236	0.120	1.112	0.978	1.266								
			MR-Egger (intercept)										0.003	0.014	0.853					
			MR-PRESSO (raw)																16.057	0.876
Familial hypercholesterolemia	GCST90200833	Cholate to adenosine 5'-monophosphate (AMP) ratio	MR Egger	18.000	-0.154	0.124	-0.397	0.088	0.230	0.857	0.673	1.092				19.347	16.000	0.251		
			Weighted median	18.000	-0.138	0.079	-0.294	0.017	0.082	0.871	0.746	1.018								
			Inverse variance weighted	18.000	-0.122	0.061	-0.242	-0.003	0.045	0.885	0.785	0.997				19.458	17.000	0.303		
			Simple mode	18.000	-0.192	0.138	-0.462	0.078	0.182	0.826	0.630	1.082								
			Weighted mode	18.000	-0.153	0.127	-0.401	0.095	0.243	0.858	0.669	1.100								
			MR-Egger (intercept)										0.005	0.017	0.766					
			MR-PRESSO (raw)																21.778	0.325
Familial hypercholesterolemia	GCST90200929	Glycerol to carnitine ratio	MR Egger	22.000	-0.087	0.063	-0.210	0.036	0.180	0.917	0.811	1.036				7.839	20.000	0.993		
			Weighted median	22.000	-0.070	0.066	-0.199	0.059	0.288	0.932	0.820	1.061								
			Inverse variance weighted	22.000	-0.097	0.045	-0.185	-0.008	0.032	0.908	0.831	0.992				7.889	21.000	0.996		
			Simple mode	22.000	-0.227	0.116	-0.454	-0.001	0.063	0.797	0.635	0.999								
			Weighted mode	22.000	-0.076	0.059	-0.192	0.040	0.214	0.927	0.825	1.041								
			MR-Egger (intercept)										-0.002	0.010	0.824					
			MR-PRESSO (raw)																8.624	0.997
Familial hypercholesterolemia	GCST90200984	Cholesterol to benzoate ratio	MR Egger	10.000	-0.239	0.290	-0.807	0.329	0.433	0.788	0.446	1.389				2.736	8.000	0.950		
			Weighted median	10.000	-0.152	0.113	-0.373	0.069	0.178	0.859	0.689	1.072								
			Inverse variance weighted	10.000	-0.180	0.088	-0.353	-0.007	0.042	0.835	0.702	0.993				2.782	9.000	0.972		
			Simple mode	10.000	-0.124	0.168	-0.453	0.204	0.477	0.883	0.636	1.226								
			Weighted mode	10.000	-0.124	0.164	-0.445	0.196	0.467	0.883	0.641	1.217								
			MR-Egger (intercept)										0.007	0.033	0.836					
			MR-PRESSO (raw)																3.341	0.977
Familial hypercholesterolemia	GCST90200992	Alanine to asparagine ratio	MR Egger	28.000	0.141	0.096	-0.047	0.329	0.154	1.151	0.954	1.390				33.464	26.000	0.149		
			Weighted median	28.000	0.155	0.069	0.020	0.290	0.024	1.168	1.020	1.336								
			Inverse variance weighted	28.000	0.117	0.051	0.017	0.218	0.021	1.125	1.018	1.243				33.573	27.000	0.179		
			Simple mode	28.000	0.072	0.140	-0.203	0.348	0.610	1.075	0.816	1.416								
			Weighted mode	28.000	0.172	0.089	-0.003	0.346	0.065	1.187	0.997	1.414								
			MR-Egger (intercept)										-0.004	0.013	0.774					

Table S3.Summary information on the SNPs used as genetic instruments.(FH→Metabolites)

Exposures: Familial hypercholesterolemia

SNP	effect_allele.exposure	other_allele.exposure	beta.exposure	se.exposure	pval.exposure	R2	F statistics
rs11591147	T	G	-0.508123	0.06264	4.99E-16	2.00E-04	65.80086
rs499883	A	G	0.144529	0.0205749	2.15E-12	0.000149907	49.34372029
rs646776	T	C	0.171424	0.0254452	1.62E-11	0.000137887	45.38672776
rs7575840	T	G	0.122598	0.0220665	2.76E-08	9.37803E-05	30.86719905
rs185567543	T	A	0.36879	0.0646098	1.14E-08	9.90E-05	32.58058216
rs118039278	A	G	0.250891	0.045168	2.78E-08	9.37E-05	30.85359712
rs2954027	A	T	-0.124388	0.0204612	1.21E-09	1.12E-04	36.95661025
rs9644862	G	T	0.115318	0.0204638	1.75E-08	9.65E-05	31.75550319
rs115478735	T	A	0.141933	0.0248997	1.20E-08	9.87E-05	32.491959
rs964184	C	G	-0.238822	0.0276063	5.11E-18	2.27E-04	74.83928272
rs112898275	C	T	-0.321033	0.0361958	7.36E-19	2.39E-04	78.66478419
rs143466522	A	G	0.560841	0.0732518	1.91E-14	1.78E-04	58.61925152
rs142834163	A	G	0.508043	0.0785085	9.72E-11	1.27E-04	41.87597628
rs7412	T	C	-0.422718	0.0491594	8.05E-18	2.25E-04	73.94106404