

## SUPPLEMENTARY TABLES

**Supplementary Table 2. Information of two outcome datasets (PBC and PSC) from FINNGEN database.**

Name	Ncase	Ncontrol	Url
Primary biliary cholangitis (PBC)	557	281127	<a href="https://storage.googleapis.com/finngen-public-data-r9/summary_stats/finngen_R9_CHIRBIL_PRIM.gz">https://storage.googleapis.com/finngen-public-data-r9/summary_stats/finngen_R9_CHIRBIL_PRIM.gz</a>
Cholangitis (primary sclerosing, PSC)	1715	330903	<a href="https://storage.googleapis.com/finngen-public-data-r9/summary_stats/finngen_R9_K11_CHOLANGI.gz">https://storage.googleapis.com/finngen-public-data-r9/summary_stats/finngen_R9_K11_CHOLANGI.gz</a>

**Supplementary Table 6. The results of reverse Mendelian randomization between ERAP1 coded protein and PBC.**

id.exposure	id.outcome	Outcome	Exposure	Method	nsnp	b	se	p-val
KxOEMA	ERAP1	ERAP1	PBC	MR Egger	3	-0.01979	0.089422	0.861327
KxOEMA	ERAP1	ERAP1	PBC	Weighted median	3	0.013847	0.012106	0.252686
KxOEMA	ERAP1	ERAP1	PBC	Inverse variance weighted	3	0.023478	0.017492	0.179524
KxOEMA	ERAP1	ERAP1	PBC	Simple mode	3	0.010633	0.016608	0.587571
KxOEMA	ERAP1	ERAP1	PBC	Weighted mode	3	0.00895	0.014435	0.598468