

Figure 1 Visualization of sensitivity analysis for eosinophil on SP. (A) Leave-one-out method of eosinophils; (B) funnel plot of eosinophils; (C) scatter diagram of eosinophils; (D) forest map of eosinophils. MR, Mendelian randomization; SE, standard error; SNP, single nucleotide polymorphism; SP, spontaneous pneumothorax.

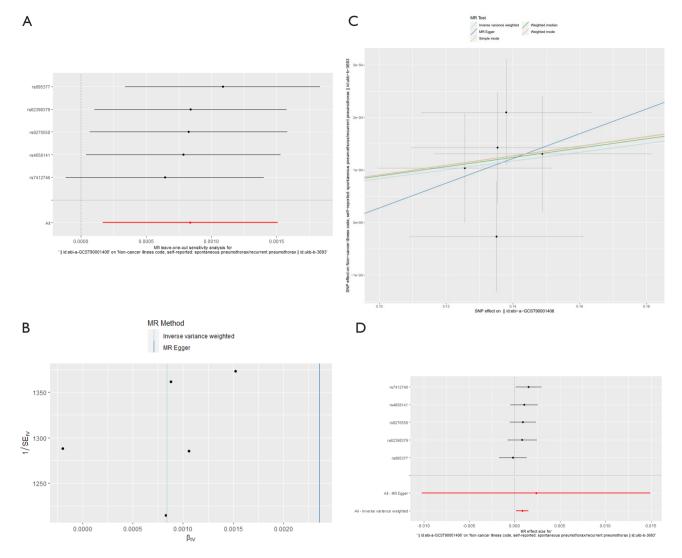


Figure S2 Visualization of sensitivity analysis for memory B cell %B cell on SP. (A) Leave-one-out method of memory B cell %B cell; (B) funnel plot of memory B cell %B cell; (C) scatter diagram of memory B cell %B cell; (D) forest map of memory B cell %B cell. MR, Mendelian randomization; SE, standard error; SNP, single nucleotide polymorphism; SP, spontaneous pneumothorax.

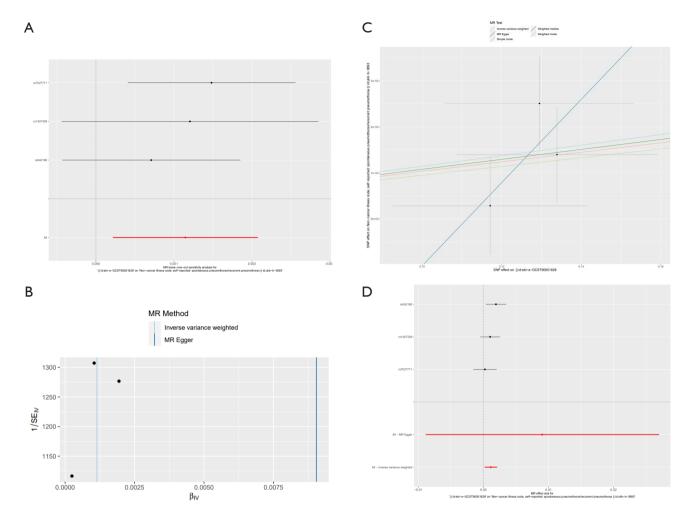


Figure S3 Visualization of sensitivity analysis for HLA-DR*CD8* T cell %T cell on SP. (A) Leave-one-out method of HLA-DR*CD8* T cell %T cell; (B) funnel plot of HLA-DR*CD8* T cell %T cell; (C) scatter diagram of HLA-DR*CD8* T cell %T cell; (D) forest map of HLA-DR*CD8* T cell %T cell. HLA-DR, human leukocyte antigen-DR isotype; MR, Mendelian randomization; SE, standard error; SNP, single nucleotide polymorphism; SP, spontaneous pneumothorax.

Outcome	Exposure-P	nSNP	OR (95% CI)		P-value
Eosinophil	5e-05				1
MR Egger		12	3.88e+00 (3.11e-47-4.85e+47)		0.981
Weighted median		12	3.71e+00 (1.11e-01-1.24e+02)		0.464
Inverse variance weighted		12	3.07e+00 (1.48e-01-6.39e+01)		0.468
Memory B cell %B cell	5e-05				i
MR Egger		12	1.85e-03 (0.00e+00-Inf)	-	0.990
Weighted median		12	6.52e-06 (3.95e-25-1.08e+14)	-	0.597
Inverse variance weighted		12	3.68e+05 (1.82e-11-7.41e+21)		10.503
CD4+ T AC	5e-05				-
MR Egger		12	1.98e+50 (0.00e+00-Inf)		0.800
Weighted median		12	9.21e-02 (3.38e-20-2.51e+17)	-	0.912
Inverse variance weighted		12	4.54e-05 (8.55e-20-2.41e+10)		0.563
CD8dim T cell Absolute Count	5e-05				i
MR Egger		12	2.76e-110 (0.00e+00-7.25e+228) =	0.540
Weighted median		12	2.08e+01 (1.03e-18-4.22e+20)		0.894
Inverse variance weighted		12	1.55e+07 (2.66e-07-9.01e+20)		0.306
Effector Memory CD4+ T cell %T c	cell 5e-05				
MR Egger		12	1.19e-222 (0.00e+00-1.00e+219) =	-10.347
Weighted median		12	1.20e-08 (3.20e-28-4.53e+11)	-	0.428
Inverse variance weighted		12	1.12e-03 (1.53e-21-8.21e+14)		0.746
HLA DR+ CD8+ T cell %T cell	5e-05				i i
MR Egger		12	1.38e-311 (0.00e+00-7.58e+64)		0.136
Weighted median		12	1.80e-08 (7.59e-28-4.26e+11)	-	10.433
Inverse variance weighted		12	3.75e-02 (1.66e-18-8.45e+14)	-	0.864
CD8dim Natural Killer T %T cell	5e-05				- 1
MR Egger		12	0.00e+00 (0.00e+00-3.61e+02)		0.080
Weighted median		12	9.88e-05 (8.86e-24-1.10e+15)		0.680
Inverse variance weighted		12	9.90e+01 (7.88e-13-1.24e+16)		0.781
-			,	0	1
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				Protective effect	Hazard effect

Figure S4 Estimating the reverse Mendelian causal effect of spontaneous pneumothorax on positive immune cells with a P-threshold of 5E-05. CI, confidence interval; CD, cluster of differentiation; Exposure-P, P value during instrumental variable extraction for exposure factors; HLA-DR, human leukocyte antigen-DR isotype; MR, Mendelian randomization; nSNP, number of single nucleotide polymorphisms; OR, odds ratio.

Outcome	Exposure-P	nSNP	OR (95% CI)		P-value
eosinophil	5e-06				I
wald ratio		1	3.87e+02 (1.08e-01-1.39e+06)		10.154
Memory B cell %B cell	5e-06				l I
Inverse variance weighted		2	6.03e-17 (2.43e-48-1.50e+15)	-	0.311
CD4+ T AC	5e-06				!
Inverse variance weighted		2	2.18e-14 (1.92e-45-2.47e+17)	-	0.389
CD8dim T cell Absolute Count	5e-06				I
Inverse variance weighted		2	6.37e-13 (2.00e-43-2.02e+18)		0.433
Effector Memory CD4+ T cell %T cell	5e-06				i
Inverse variance weighted		2	3.81e-27 (1.03e-58-1.41e+05)	-	0.101
HLA DR+ CD8+ T cell %T cell	5e-06				!
Inverse variance weighted		2	3.04e-19 (4.20e-49-2.20e+11)	-	10.224
CD8dim Natural Killer T %T cell	5e-06				l I
Inverse variance weighted		2	1.67e-21 (9.32e-53-3.00e+10)		0.193
				0	1
				Protective effect	Hazard effect

Figure S5 Estimating the reverse Mendelian causal effect of spontaneous pneumothorax on positive immune cells with a P-threshold of 5E-06. CI, confidence interval; CD, cluster of differentiation; Exposure-P, P value during instrumental variable extraction for exposure factors; HLA-DR, human leukocyte antigen-DR isotype; nSNP, number of single nucleotide polymorphisms; OR, odds ratio.