

Supplementary Materials for An observational and genetic investigation into the association between psoriasis and risk of malignancy

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Supplementary Table 1. Multi-variable Cox regression analysis for risk of cancers associated with psoriasis (Whole population).

All statistical tests are two-sided and unadjusted for multiple comparisons.

Cancers	Case/Total	HR (95%CI)	p value
Lip, oral cavity and pharynx			
C00 Malignant neoplasm of lip	62/476574	1.68(0.52,5.37)	0.383
C02 Malignant neoplasm of other and unspecified parts of tongue	269/476495	1.20(0.64,2.26)	0.573
C03 Malignant neoplasm of gum	65/476589	0.48(0.07,3.50)	0.471
C04 Malignant neoplasm of floor of mouth	53/476567	2.39(0.89,6.42)	0.083
C06 Malignant neoplasm of other and unspecified parts of mouth	95/476570	1.37(0.50,3.76)	0.539
C07 Malignant neoplasm of parotid gland	117/476550	1.51(0.62,3.72)	0.365
C09 Malignant neoplasm of tonsil	283/476505	0.66(0.30,1.49)	0.323
C10 Malignant neoplasm of oropharynx	102/476574	1.16(0.43,3.15)	0.772
C14 Malignant neoplasm of other and ill-defined sites in the lip, oral cavity and pharynx	94/476578	0.91(0.29,2.86)	0.866
Digestive organs			
C15 Malignant neoplasm of oesophagus	1405/476411	1.05(0.80,1.40)	0.716
C16 Malignant neoplasm of stomach	1079/476449	0.93(0.66,1.32)	0.680
C17 Malignant neoplasm of small intestine	315/476542	0.85(0.42,1.72)	0.654
C18 Malignant neoplasm of colon	4730/475361	0.97(0.82,1.15)	0.762
C19 Malignant neoplasm of rectosigmoid junction	1107/476293	0.79(0.54,1.16)	0.235
C20 Malignant neoplasm of rectum	2040/475891	1.14(0.90,1.45)	0.282
C21 Malignant neoplasm of anus and anal canal	268/476518	1.64(0.93,2.89)	0.089
C22 Malignant neoplasm of liver and intrahepatic bile ducts	903/476551	1.24(0.89,1.72)	0.211
C23 Malignant neoplasm of gallbladder	147/476595	1.10(0.45,2.69)	0.842
C24 Malignant neoplasm of other and unspecified parts of biliary tract	289/476566	0.91(0.45,1.85)	0.798
C25 Malignant neoplasm of pancreas	1581/476529	0.94(0.70,1.25)	0.660
C26 Malignant neoplasm of other and ill-defined digestive organs	285/476551	1.43(0.81,2.52)	0.214
Respiratory system and intrathoracic organs			
C32 Malignant neoplasm of larynx	253/476460	1.39(0.78,2.45)	0.260
C34 Malignant neoplasm of bronchus and lung	4828/476296	1.15(0.99,1.32)	0.065
C38 Malignant neoplasm of heart, mediastinum and pleura	93/476591	1.06(0.33,3.34)	0.926
Bone and articular cartilage			
C41 Malignant neoplasm of bone and articular cartilage of other and unspecified sites	141/476565	1.01(0.41,2.46)	0.989
Skin			
C43 Malignant melanoma of skin	2862/475595	1.14(0.92,1.42)	0.223
C44 Other malignant neoplasms of skin	17470/471914	1.11(1.02,1.21)	0.015
Mesothelial and soft tissue			
C45 Mesothelioma	474/476590	1.54(1.00,2.37)	0.048
C48 Malignant neoplasm of retroperitoneum and peritoneum	357/476559	1.04(0.55,1.94)	0.911
C49 Malignant neoplasm of other connective and soft tissue	399/476442	0.72(0.37,1.42)	0.345
Breast			
C50 Malignant neoplasm of breast	10173/470084	1.23(1.11,1.38)	< 0.001
Urinary tract			
C64 Malignant neoplasm of kidney, except renal pelvis	1650/476220	1.17(0.91,1.51)	0.222
C66 Malignant neoplasm of ureter	184/476572	0.66(0.24,1.77)	0.407
C67 Malignant neoplasm of bladder	3012/475613	1.18(0.99,1.42)	0.071
C68 Malignant neoplasm of other and unspecified urinary organs	78/476586	1.59(0.58,4.35)	0.369
Central nervous system			
C69 Malignant neoplasm of eye and adnexa	157/476478	0.63(0.20,1.97)	0.426
C71 Malignant neoplasm of brain	967/476502	0.96(0.66,1.40)	0.830
Endocrine glands			
C73 Malignant neoplasm of thyroid gland	454/476378	0.64(0.32,1.29)	0.211
Ill-defined, secondary and unspecified sites			
C76 Malignant neoplasm of other and ill-defined sites	168/476544	0.55(0.17,1.77)	0.315
C77 Secondary and unspecified malignant neoplasm of lymph nodes	9634/474581	1.12(1.00,1.25)	0.045
C78 Secondary malignant neoplasm of respiratory and digestive organs	11082/476023	0.95(0.85,1.06)	0.361
C79 Secondary malignant neoplasm of other sites	8958/476179	0.97(0.86,1.10)	0.633
C80 Malignant neoplasm without specification of site	2454/476329	0.95(0.75,1.20)	0.664
Lymphoid, haematopoietic and related tissue			
C81 Hodgkin's disease	262/476436	1.50(0.84,2.69)	0.167
C82 Follicular [nodular] non-Hodgkin's lymphoma	577/476370	0.85(0.51,1.42)	0.535
C83 Diffuse non-Hodgkin's lymphoma	1435/476329	1.17(0.88,1.55)	0.283
C85 Other and unspecified types of non-Hodgkin's lymphoma	1367/475959	1.04(0.76,1.41)	0.814
C86 Other specified types of T/NK-cell lymphoma	62/476599	1.70(0.53,5.45)	0.369
C88 Malignant immunoproliferative diseases	236/476572	0.74(0.31,1.80)	0.509
C90 Multiple myeloma and malignant plasma cell neoplasms	1123/476396	1.03(0.73,1.45)	0.862
C91 Lymphoid leukaemia	978/476324	0.91(0.62,1.34)	0.639
C92 Myeloid leukaemia	727/476393	1.34(0.92,1.94)	0.124
C94 Other leukaemias of specified cell type	60/476597	0.53(0.07,3.86)	0.535
Primary multiple sites			
C97 Malignant neoplasms of primary multiple sites	1282/476594	1.43(1.08,1.88)	0.011

Supplementary Table 2. Multi-variable Cox regression analysis for risk of cancers associated with psoriasis (Male).

All statistical tests are two-sided and unadjusted for multiple comparisons.

Cancers	Case/Total	HR (95%CI)	p value
Lip, oral cavity and pharynx			
C00 Malignant neoplasm of lip	30/219669	0.98(0.13,7.21)	0.983
C02 Malignant neoplasm of other and unspecified parts of tongue	173/219615	1.22(0.57,2.60)	0.609
C03 Malignant neoplasm of gum	40/219675	0.80(0.11,5.87)	0.830
C04 Malignant neoplasm of floor of mouth	42/219657	2.94(1.05,8.27)	0.040
C06 Malignant neoplasm of other and unspecified parts of mouth	65/219669	1.44(0.45,4.61)	0.535
C07 Malignant neoplasm of parotid gland	60/219656	1.61(0.50,5.16)	0.420
C09 Malignant neoplasm of tonsil	210/219611	0.57(0.21,1.55)	0.273
C10 Malignant neoplasm of oropharynx	80/219663	1.09(0.34,3.45)	0.887
C11 Malignant neoplasm of nasopharynx	33/219670	0.91(0.13,6.59)	0.917
C12 Malignant neoplasm of pyriform sinus	39/219667	1.35(0.33,5.57)	0.688
C14 Malignant neoplasm of other and ill-defined sites in the lip, oral cavity and pharynx	71/219666	0.75(0.18,3.06)	0.686
Digestive organs			
C15 Malignant neoplasm of oesophagus	1027/219535	0.95(0.68,1.33)	0.776
C16 Malignant neoplasm of stomach	760/219590	0.82(0.54,1.26)	0.367
C17 Malignant neoplasm of small intestine	171/219650	1.28(0.60,2.73)	0.523
C18 Malignant neoplasm of colon	2533/218984	1.00(0.81,1.25)	0.982
C19 Malignant neoplasm of rectosigmoid junction	706/219517	0.63(0.38,1.06)	0.080
C20 Malignant neoplasm of rectum	1275/219246	1.05(0.78,1.42)	0.740
C21 Malignant neoplasm of anus and anal canal	91/219652	0.67(0.16,2.71)	0.571
C22 Malignant neoplasm of liver and intrahepatic bile ducts	559/219652	1.47(1.01,2.14)	0.046
C23 Malignant neoplasm of gallbladder	46/219682	1.34(0.32,5.54)	0.685
C24 Malignant neoplasm of other and unspecified parts of biliary tract	151/219663	0.40(0.10,1.61)	0.197
C25 Malignant neoplasm of pancreas	839/219641	1.01(0.70,1.47)	0.944
C26 Malignant neoplasm of other and ill-defined digestive organs	165/219657	0.52(0.17,1.63)	0.261
Respiratory system and intrathoracic organs			
C32 Malignant neoplasm of larynx	223/219559	1.31(0.70,2.43)	0.399
C34 Malignant neoplasm of bronchus and lung	2502/219504	1.22(1.01,1.48)	0.040
C38 Malignant neoplasm of heart, mediastinum and pleura	55/219681	0.56(0.08,4.02)	0.561
Bone and articular cartilage			
C41 Malignant neoplasm of bone and articular cartilage of other and unspecified sites	93/219664	0.64(0.18,2.26)	0.484
Skin			
C43 Malignant melanoma of skin	1451/219293	1.11(0.83,1.48)	0.497
C44 Other malignant neoplasms of skin	9775/217337	1.12(1.00,1.25)	0.041
Mesothelial and soft tissue			
C45 Mesothelioma	378/219675	1.53(0.95,2.46)	0.078
C48 Malignant neoplasm of retroperitoneum and peritoneum	61/219672	0.49(0.07,3.54)	0.480
C49 Malignant neoplasm of other connective and soft tissue	238/219596	0.71(0.31,1.63)	0.421
Breast			
C50 Malignant neoplasm of breast	98/219645	0.92(0.29,2.92)	0.893
Male genital organs			
C60 Malignant neoplasm of penis	83/219653	3.02(1.45,6.29)	0.003
C61 Malignant neoplasm of prostate	10764/217466	0.89(0.80,1.00)	0.048
C62 Malignant neoplasm of testis	109/219448	0.91(0.29,2.89)	0.879
Urinary tract			
C64 Malignant neoplasm of kidney, except renal pelvis	1076/219436	1.23(0.91,1.67)	0.177
C66 Malignant neoplasm of ureter	128/219664	0.67(0.21,2.11)	0.497
C67 Malignant neoplasm of bladder	2276/218934	1.23(1.00,1.51)	0.046
C68 Malignant neoplasm of other and unspecified urinary organs	68/219672	1.34(0.42,4.27)	0.622
Central nervous system			
C69 Malignant neoplasm of eye and adnexa	88/219626	0.69(0.17,2.83)	0.611
C71 Malignant neoplasm of brain	555/219633	1.06(0.67,1.69)	0.802
Endocrine glands			
C73 Malignant neoplasm of thyroid gland	130/219629	1.43(0.63,3.25)	0.394
C74 Malignant neoplasm of adrenal gland	30/219673	2.08(0.48,8.81)	0.313
Ill-defined, secondary and unspecified sites			
C76 Malignant neoplasm of other and ill-defined sites	75/219655	0.63(0.14,2.77)	0.539
C77 Secondary and unspecified malignant neoplasm of lymph nodes	4157/219201	1.04(0.88,1.22)	0.682
C78 Secondary malignant neoplasm of respiratory and digestive organs	5209/219437	0.95(0.81,1.10)	0.496
C79 Secondary malignant neoplasm of other sites	4700/219532	1.03(0.88,1.20)	0.702
C80 Malignant neoplasm without specification of site	1166/219561	1.12(0.83,1.51)	0.473
Lymphoid, haematopoietic and related tissue			
C81 Hodgkin's disease	141/219592	1.92(0.98,3.79)	0.058
C82 Follicular [nodular] non-Hodgkin's lymphoma	272/219564	1.33(0.75,2.38)	0.329
C83 Diffuse non-Hodgkin's lymphoma	816/219512	1.22(0.86,1.74)	0.274
C85 Other and unspecified types of non-Hodgkin's lymphoma	749/219328	1.09(0.75,1.61)	0.645
C86 Other specified types of T/NK-cell lymphoma	39/219683	0.82(0.11,5.99)	0.846

C88 Malignant immunoproliferative diseases	135/219670	0.97(0.36,2.62)	0.950
C90 Multiple myeloma and malignant plasma cell neoplasms	653/219560	1.07(0.70,1.63)	0.769
C91 Lymphoid leukaemia	631/219495	0.87(0.54,1.38)	0.549
C92 Myeloid leukaemia	424/219579	1.47(0.94,2.30)	0.094
C94 Other leukaemias of specified cell type	37/219683	0.81(0.11,5.90)	0.833
Primary multiple sites			
C97 Malignant neoplasms of primary multiple sites	757/219682	1.38(0.97,1.96)	0.073

Supplementary Table 3. Multi-variable Cox regression analysis for risk of cancers associated with psoriasis (Female).

All statistical tests are two-sided and unadjusted for multiple comparisons

Cancers	Case/Total	HR (95%CI)	p value
Lip, oral cavity and pharynx			
C00 Malignant neoplasm of lip	32/256905	2.54(0.60,10.67)	0.203
C02 Malignant neoplasm of other and unspecified parts of tongue	96/256880	1.15(0.36,3.66)	0.811
C06 Malignant neoplasm of other and unspecified parts of mouth	30/256901	1.23(0.17,9.03)	0.839
C07 Malignant neoplasm of parotid gland	57/256894	1.41(0.34,5.81)	0.632
C09 Malignant neoplasm of tonsil	73/256894	0.95(0.23,3.88)	0.942
Digestive organs			
C15 Malignant neoplasm of oesophagus	378/256876	1.40(0.84,2.33)	0.202
C16 Malignant neoplasm of stomach	319/256859	1.25(0.69,2.29)	0.464
C17 Malignant neoplasm of small intestine	144/256892	0.26(0.04,1.83)	0.175
C18 Malignant neoplasm of colon	2197/256377	0.93(0.71,1.22)	0.604
C19 Malignant neoplasm of rectosigmoid junction	401/256776	1.14(0.64,2.03)	0.649
C20 Malignant neoplasm of rectum	765/256645	1.32(0.89,1.94)	0.165
C21 Malignant neoplasm of anus and anal canal	177/256866	2.27(1.21,4.23)	0.010
C22 Malignant neoplasm of liver and intrahepatic bile ducts	344/256899	0.81(0.41,1.61)	0.552
C23 Malignant neoplasm of gallbladder	101/256913	0.99(0.31,3.14)	0.984
C24 Malignant neoplasm of other and unspecified parts of biliary tract	138/256903	1.60(0.70,3.65)	0.263
C25 Malignant neoplasm of pancreas	742/256888	0.83(0.52,1.33)	0.433
C26 Malignant neoplasm of other and ill-defined digestive organs	120/256894	3.17(1.63,6.18)	0.001
Respiratory system and intrathoracic organs			
C32 Malignant neoplasm of larynx	30/256901	1.96(0.47,8.27)	0.358
C34 Malignant neoplasm of bronchus and lung	2326/256792	1.05(0.84,1.31)	0.648
C38 Malignant neoplasm of heart, mediastinum and pleura	38/256910	1.95(0.47,8.12)	0.360
Bone and articular cartilage			
C41 Malignant neoplasm of bone and articular cartilage of other and unspecified sites	48/256901	1.99(0.57,7.01)	0.283
Skin			
C43 Malignant melanoma of skin	1411/256302	1.19(0.86,1.64)	0.298
C44 Other malignant neoplasms of skin	7695/254577	1.09(0.95,1.26)	0.227
Mesothelial and soft tissue			
C45 Mesothelioma	96/256915	1.55(0.57,4.24)	0.389
C48 Malignant neoplasm of retroperitoneum and peritoneum	296/256887	1.18(0.60,2.28)	0.633
C49 Malignant neoplasm of other connective and soft tissue	161/256846	0.73(0.23,2.28)	0.586
Breast			
C50 Malignant neoplasm of breast	10075/250439	1.24(1.11,1.38)	< 0.001
Female genital organs			
C51 Malignant neoplasm of vulva	152/256860	1.29(0.55,2.99)	0.560
C53 Malignant neoplasm of cervix uteri	185/256718	1.51(0.71,3.21)	0.288
C54 Malignant neoplasm of corpus uteri	1638/256272	1.23(0.94,1.61)	0.135
C55 Malignant neoplasm of uterus, part unspecified	199/256862	0.97(0.40,2.36)	0.949
C56 Malignant neoplasm of ovary	1269/256470	1.20(0.87,1.65)	0.258
C57 Malignant neoplasm of other and unspecified female genital organs	232/256894	1.19(0.56,2.52)	0.653
Urinary tract			
C64 Malignant neoplasm of kidney, except renal pelvis	574/256784	1.04(0.64,1.68)	0.885
C66 Malignant neoplasm of ureter	56/256908	0.62(0.09,4.48)	0.634
C67 Malignant neoplasm of bladder	736/256679	1.02(0.67,1.56)	0.935
Central nervous system			
C69 Malignant neoplasm of eye and adnexa	69/256852	0.52(0.07,3.76)	0.518
C71 Malignant neoplasm of brain	412/256869	0.80(0.41,1.57)	0.520
Endocrine glands			
C73 Malignant neoplasm of thyroid gland	324/256749	0.24(0.06,0.96)	0.043
Ill-defined, secondary and unspecified sites			
C76 Malignant neoplasm of other and ill-defined sites	93/256889	0.41(0.06,2.97)	0.380
C77 Secondary and unspecified malignant neoplasm of lymph nodes	5477/255380	1.20(1.03,1.39)	0.018
C78 Secondary malignant neoplasm of respiratory and digestive organs	5873/256586	0.95(0.81,1.11)	0.526
C79 Secondary malignant neoplasm of other sites	4258/256647	0.89(0.74,1.08)	0.245
C80 Malignant neoplasm without specification of site	1288/256768	0.78(0.54,1.13)	0.191
Lymphoid, haematopoietic and related tissue			
C81 Hodgkin's disease	121/256844	0.90(0.29,2.84)	0.859
C82 Follicular [nodular] non-Hodgkin's lymphoma	305/256806	0.35(0.11,1.08)	0.067
C83 Diffuse non-Hodgkin's lymphoma	619/256817	1.09(0.68,1.75)	0.724
C85 Other and unspecified types of non-Hodgkin's lymphoma	618/256631	0.95(0.58,1.57)	0.848
C88 Malignant immunoproliferative diseases	101/256902	0.38(0.05,2.76)	0.341
C90 Multiple myeloma and malignant plasma cell neoplasms	470/256836	0.97(0.54,1.73)	0.913
C91 Lymphoid leukaemia	347/256829	1.01(0.52,1.96)	0.980
C92 Myeloid leukaemia	303/256814	1.12(0.58,2.18)	0.729
Primary multiple sites			
C97 Malignant neoplasms of primary multiple sites	525/256912	1.50(0.97,2.34)	0.070

Supplementary Table 4. Multi-variable Cox regression analysis for risk of exclusive cancer diagnoses associated with psoriasis (Whole population).

Cancers	Case/Total	HR (95%CI)	p value
C15 Malignant neoplasm of oesophagus	161/437716	1.87(0.99,3.56)	0.055
C16 Malignant neoplasm of stomach	108/437716	0.58(0.14,2.36)	0.449
C18 Malignant neoplasm of colon	1366/437405	1.08(0.80,1.46)	0.614
C19 Malignant neoplasm of rectosigmoid junction	109/437695	0.31(0.04,2.24)	0.247
C20 Malignant neoplasm of rectum	698/437489	1.25(0.85,1.85)	0.260
C22 Malignant neoplasm of liver and intrahepatic bile ducts	242/437740	1.28(0.69,2.38)	0.431
C25 Malignant neoplasm of pancreas	182/437741	1.17(0.54,2.54)	0.695
C34 Malignant neoplasm of bronchus and lung	804/437688	1.56(1.14,2.12)	0.005
C43 Malignant melanoma of skin	1448/437205	1.15(0.84,1.56)	0.388
C44 Other malignant neoplasms of skin	11060/435315	1.10(0.98,1.23)	0.102
C45 Mesothelioma	132/437752	0.99(0.37,2.69)	0.992
C49 Malignant neoplasm of other connective and soft tissue	136/437682	1.31(0.54,3.21)	0.552
C50 Malignant neoplasm of breast	5202/434375	1.28(1.09,1.49)	0.002
C64 Malignant neoplasm of kidney, except renal pelvis	662/437575	1.15(0.76,1.74)	0.522
C67 Malignant neoplasm of bladder	1251/437331	1.24(0.93,1.65)	0.142
C71 Malignant neoplasm of brain	399/437726	1.88(1.21,2.93)	0.005
C73 Malignant neoplasm of thyroid gland	244/437613	0.31(0.08,1.25)	0.101
C82 Follicular [nodular] non-Hodgkin's lymphoma	130/437721	1.10(0.41,2.99)	0.848
C83 Diffuse non-Hodgkin's lymphoma	375/437724	1.13(0.64,2.01)	0.671
C85 Other and unspecified types of non-Hodgkin's lymphoma	189/437646	1.14(0.50,2.57)	0.756
C90 Multiple myeloma and malignant plasma cell neoplasms	626/437664	1.38(0.92,2.06)	0.115
C91 Lymphoid leukaemia	457/437660	0.94(0.54,1.64)	0.830
C92 Myeloid leukaemia	350/437662	1.37(0.80,2.34)	0.251

All statistical tests are two-sided and unadjusted for multiple comparisons.

Supplementary Table 5. Multi-variable Cox regression analysis for risk of exclusive cancer diagnoses associated with psoriasis (Male).

Cancers	Case/Total	HR (95%CI)	p value
C15 Malignant neoplasm of oesophagus	104/200514	1.31(0.53,3.21)	0.558
C18 Malignant neoplasm of colon	702/200347	1.44(1.01,2.05)	0.043
C20 Malignant neoplasm of rectum	426/200379	1.30(0.81,2.09)	0.275
C22 Malignant neoplasm of liver and intrahepatic bile ducts	173/200534	1.46(0.74,2.85)	0.273
C34 Malignant neoplasm of bronchus and lung	374/200503	1.70(1.11,2.61)	0.015
C43 Malignant melanoma of skin	629/200366	1.42(0.95,2.12)	0.086
C44 Other malignant neoplasms of skin	5844/199456	1.12(0.97,1.30)	0.119
C45 Mesothelioma	101/200542	0.92(0.29,2.91)	0.891
C61 Malignant neoplasm of prostate	7216/199116	0.94(0.82,1.07)	0.350
C64 Malignant neoplasm of kidney, except renal pelvis	402/200433	1.25(0.76,2.07)	0.379
C67 Malignant neoplasm of bladder	896/200227	1.29(0.93,1.79)	0.122
C71 Malignant neoplasm of brain	221/200533	2.13(1.24,3.66)	0.006
C83 Diffuse non-Hodgkin's lymphoma	195/200528	0.84(0.34,2.04)	0.696
C90 Multiple myeloma and malignant plasma cell neoplasms	329/200497	1.57(0.95,2.59)	0.081
C91 Lymphoid leukaemia	275/200480	0.86(0.42,1.76)	0.674
C92 Myeloid leukaemia	194/200501	1.48(0.76,2.89)	0.252

All statistical tests are two-sided and unadjusted for multiple comparisons.

Supplementary Table 6. Multi-variable Cox regression analysis for risk of exclusive cancer diagnoses associated with psoriasis (Female).

Cancers	Case/Total	HR (95%CI)	p value
C18 Malignant neoplasm of colon	664/237058	0.62(0.34,1.13)	0.121
C20 Malignant neoplasm of rectum	272/237110	1.13(0.56,2.28)	0.742
C34 Malignant neoplasm of bronchus and lung	430/237185	1.42(0.90,2.24)	0.127
C43 Malignant melanoma of skin	819/236839	0.89(0.55,1.45)	0.637
C44 Other malignant neoplasms of skin	5216/235859	1.05(0.88,1.26)	0.572
C50 Malignant neoplasm of breast	5162/233840	1.26(1.08,1.48)	0.003
C54 Malignant neoplasm of corpus uteri	910/236832	1.23(0.86,1.76)	0.263
C56 Malignant neoplasm of ovary	258/237008	1.10(0.52,2.33)	0.807
C64 Malignant neoplasm of kidney, except renal pelvis	260/237142	0.96(0.45,2.03)	0.905
C67 Malignant neoplasm of bladder	355/237104	1.09(0.60,1.99)	0.781
C71 Malignant neoplasm of brain	178/237193	1.55(0.73,3.30)	0.257
C83 Diffuse non-Hodgkin's lymphoma	180/237196	1.51(0.71,3.22)	0.284
C85 Other and unspecified types of non-Hodgkin's lymphoma	106/237154	0.74(0.18,3.02)	0.680
C90 Multiple myeloma and malignant plasma cell neoplasms	297/237167	1.13(0.58,2.22)	0.715
C91 Lymphoid leukaemia	182/237180	1.10(0.45,2.67)	0.840
C92 Myeloid leukaemia	156/237161	1.22(0.50,2.97)	0.666

All statistical tests are two-sided and unadjusted for multiple comparisons.

Supplementary Table 7. Multi-variable logistic regression analysis for risk of cancers associated with psoriasis PRSs (Whole population).

All statistical tests are two-sided and unadjusted for multiple comparisons.

Cancer	Case/Total	OR (95%CI)	p value
Lip, oral cavity and pharynx			
C00 Malignant neoplasm of lip	51/387698	1.02(0.97,1.08)	0.436
C02 Malignant neoplasm of other and unspecified parts of tongue	211/387629	1.01(0.98,1.04)	0.369
C03 Malignant neoplasm of gum	52/387708	1.04(0.99,1.10)	0.147
C06 Malignant neoplasm of other and unspecified parts of mouth	76/387696	0.97(0.93,1.02)	0.222
C07 Malignant neoplasm of parotid gland	90/387679	0.96(0.92,1.00)	0.068
C09 Malignant neoplasm of tonsil	241/387640	1.00(0.97,1.02)	0.796
C10 Malignant neoplasm of oropharynx	81/387699	0.99(0.94,1.03)	0.518
C14 Malignant neoplasm of other and ill-defined sites in the lip, oral cavity and pharynx	74/387703	0.99(0.95,1.04)	0.794
Digestive organs			
C15 Malignant neoplasm of oesophagus	1246/387562	1.00(0.98,1.01)	0.542
C16 Malignant neoplasm of stomach	909/387605	1.00(0.99,1.02)	0.591
C17 Malignant neoplasm of small intestine	258/387665	1.00(0.97,1.02)	0.770
C18 Malignant neoplasm of colon	3972/386681	1.00(0.99,1.01)	0.941
C19 Malignant neoplasm of rectosigmoid junction	922/387460	1.00(0.98,1.01)	0.846
C20 Malignant neoplasm of rectum	1724/387095	1.00(0.99,1.01)	0.440
C21 Malignant neoplasm of anus and anal canal	225/387646	1.02(0.99,1.05)	0.225
C22 Malignant neoplasm of liver and intrahepatic bile ducts	745/387682	1.00(0.99,1.02)	0.532
C23 Malignant neoplasm of gallbladder	122/387713	1.01(0.97,1.05)	0.667
C24 Malignant neoplasm of other and unspecified parts of biliary tract	250/387689	0.99(0.97,1.02)	0.624
C25 Malignant neoplasm of pancreas	1308/387657	0.99(0.98,1.00)	0.250
C26 Malignant neoplasm of other and ill-defined digestive organs	237/387680	1.00(0.98,1.03)	0.839
Respiratory system and intrathoracic organs			
C32 Malignant neoplasm of larynx	219/387595	0.99(0.96,1.02)	0.564
C34 Malignant neoplasm of bronchus and lung	3950/387475	1.01(1.00,1.01)	0.022
C38 Malignant neoplasm of heart, mediastinum and pleura	79/387712	0.99(0.94,1.03)	0.577
Bone and articular cartilage			
C41 Malignant neoplasm of bone and articular cartilage of other and unspecified sites	110/387687	0.99(0.95,1.03)	0.499
Skin			
C43 Malignant melanoma of skin	2512/386832	1.00(0.99,1.00)	0.294
C44 Other malignant neoplasms of skin	15419/383570	1.00(1.00,1.00)	0.513
Mesothelial and soft tissue			
C45 Mesothelioma	422/387709	0.99(0.97,1.01)	0.541
C48 Malignant neoplasm of retroperitoneum and peritoneum	302/387684	0.99(0.97,1.02)	0.659
C49 Malignant neoplasm of other connective and soft tissue	322/387594	0.98(0.96,1.01)	0.153
Breast			
C50 Malignant neoplasm of breast	8338/382505	1.01(1.00,1.01)	0.024
Urinary tract			
C64 Malignant neoplasm of kidney, except renal pelvis	1390/387387	1.02(1.01,1.03)	0.003
C66 Malignant neoplasm of ureter	164/387694	1.01(0.98,1.05)	0.463
C67 Malignant neoplasm of bladder	2569/386884	1.00(0.99,1.01)	0.591
C68 Malignant neoplasm of other and unspecified urinary organs	63/387703	0.99(0.93,1.04)	0.618
Central nervous system			
C69 Malignant neoplasm of eye and adnexa	132/387616	1.00(0.97,1.04)	0.915
C71 Malignant neoplasm of brain	795/387637	1.00(0.98,1.01)	0.574
Endocrine glands			
C73 Malignant neoplasm of thyroid gland	336/387541	0.99(0.97,1.01)	0.434
Ill-defined, secondary and unspecified sites			
C76 Malignant neoplasm of other and ill-defined sites	139/387677	0.97(0.94,1.00)	0.092
C77 Secondary and unspecified malignant neoplasm of lymph nodes	7952/386082	1.00(1.00,1.01)	0.513
C78 Secondary malignant neoplasm of respiratory and digestive organs	9224/387252	1.00(1.00,1.01)	0.174
C79 Secondary malignant neoplasm of other sites	7427/387372	1.01(1.00,1.01)	0.031
C80 Malignant neoplasm without specification of site	2034/387504	1.01(1.00,1.02)	0.202
Lymphoid, haematopoietic and related tissue			
C81 Hodgkin's disease	210/387592	0.98(0.96,1.01)	0.226
C82 Follicular [nodular] non-Hodgkin's lymphoma	475/387536	1.02(1.00,1.04)	0.027
C83 Diffuse non-Hodgkin's lymphoma	1188/387484	1.00(0.99,1.01)	0.574
C85 Other and unspecified types of non-Hodgkin's lymphoma	1131/387185	0.99(0.98,1.00)	0.223
C88 Malignant immunoproliferative diseases	196/387694	0.98(0.95,1.00)	0.095
C90 Multiple myeloma and malignant plasma cell neoplasms	916/387546	0.99(0.98,1.01)	0.388
C91 Lymphoid leukaemia	814/387482	0.99(0.98,1.00)	0.170
C92 Myeloid leukaemia	619/387540	1.00(0.99,1.02)	0.732
Primary multiple sites			
C97 Malignant neoplasms of primary multiple sites	1133/387717	1.00(0.99,1.02)	0.671

Supplementary Table 8. Multi-variable logistic regression analysis for risk of cancers associated with psoriasis PRs (Male).

All statistical tests are two-sided and unadjusted for multiple comparisons.

Cancer	Case/Total	OR (95%CI)	p value
Lip, oral cavity and pharynx			
C02 Malignant neoplasm of other and unspecified parts of tongue	140/179956	0.99(0.96,1.03)	0.781
C03 Malignant neoplasm of gum	31/180008	1.02(0.94,1.09)	0.690
C04 Malignant neoplasm of floor of mouth	32/179995	1.00(0.93,1.08)	0.982
C06 Malignant neoplasm of other and unspecified parts of mouth	49/180005	0.95(0.89,1.01)	0.106
C07 Malignant neoplasm of parotid gland	51/179993	0.98(0.92,1.04)	0.451
C09 Malignant neoplasm of tonsil	182/179957	0.99(0.96,1.02)	0.635
C10 Malignant neoplasm of oropharynx	63/180001	0.97(0.93,1.03)	0.319
C14 Malignant neoplasm of other and ill-defined sites in the lip, oral cavity and pharynx	56/180004	0.99(0.94,1.05)	0.839
Digestive organs			
C15 Malignant neoplasm of oesophagus	908/179894	0.99(0.98,1.01)	0.453
C16 Malignant neoplasm of stomach	647/179942	1.00(0.98,1.02)	0.904
C17 Malignant neoplasm of small intestine	143/179987	1.00(0.97,1.04)	0.817
C18 Malignant neoplasm of colon	2164/179419	1.00(0.99,1.01)	0.819
C19 Malignant neoplasm of rectosigmoid junction	590/179873	1.00(0.98,1.02)	0.946
C20 Malignant neoplasm of rectum	1092/179627	1.01(1.00,1.02)	0.143
C21 Malignant neoplasm of anus and anal canal	72/179989	1.00(0.95,1.05)	0.972
C22 Malignant neoplasm of liver and intrahepatic bile ducts	466/179992	1.01(0.99,1.03)	0.255
C23 Malignant neoplasm of gallbladder	40/180014	1.04(0.97,1.11)	0.240
C24 Malignant neoplasm of other and unspecified parts of biliary tract	131/179999	0.99(0.95,1.02)	0.450
C25 Malignant neoplasm of pancreas	696/179980	1.00(0.99,1.02)	0.882
C26 Malignant neoplasm of other and ill-defined digestive organs	138/179995	1.00(0.96,1.03)	0.920
Respiratory system and intrathoracic organs			
C32 Malignant neoplasm of larynx	193/179907	1.00(0.97,1.03)	0.895
C34 Malignant neoplasm of bronchus and lung	2076/179871	1.01(1.00,1.02)	0.028
C38 Malignant neoplasm of heart, mediastinum and pleura	49/180014	1.00(0.94,1.06)	0.899
Bone and articular cartilage			
C41 Malignant neoplasm of bone and articular cartilage of other and unspecified sites	72/179999	1.00(0.95,1.05)	0.998
Skin			
C43 Malignant melanoma of skin	1255/179666	1.00(0.99,1.01)	0.864
C44 Other malignant neoplasms of skin	8662/177919	1.00(0.99,1.00)	0.648
Mesothelial and soft tissue			
C45 Mesothelioma	340/180008	0.99(0.97,1.01)	0.291
C48 Malignant neoplasm of retroperitoneum and peritoneum	54/180008	0.99(0.94,1.05)	0.792
C49 Malignant neoplasm of other connective and soft tissue	193/179950	0.97(0.94,1.00)	0.037
Breast			
C50 Malignant neoplasm of breast	79/179981	0.98(0.93,1.03)	0.370
Male genital organs			
C60 Malignant neoplasm of penis	67/179989	0.95(0.91,1.00)	0.057
C61 Malignant neoplasm of prostate	8956/178110	1.00(1.00,1.01)	0.404
C62 Malignant neoplasm of testis	87/179814	1.02(0.97,1.06)	0.423
Urinary tract			
C64 Malignant neoplasm of kidney, except renal pelvis	908/179794	1.02(1.01,1.03)	0.003
C66 Malignant neoplasm of ureter	112/179999	1.02(0.98,1.06)	0.424
C67 Malignant neoplasm of bladder	1947/179368	1.00(0.99,1.01)	0.838
C68 Malignant neoplasm of other and unspecified urinary organs	54/180003	0.98(0.93,1.04)	0.572
Central nervous system			
C69 Malignant neoplasm of eye and adnexa	76/179966	1.02(0.97,1.07)	0.442
C71 Malignant neoplasm of brain	453/179977	0.99(0.98,1.01)	0.605
Endocrine glands			
C73 Malignant neoplasm of thyroid gland	102/179972	1.01(0.97,1.05)	0.768
Ill-defined, secondary and unspecified sites			
C76 Malignant neoplasm of other and ill-defined sites	60/179995	0.96(0.92,1.01)	0.152
C77 Secondary and unspecified malignant neoplasm of lymph nodes	3504/179598	1.00(0.99,1.01)	0.766
C78 Secondary malignant neoplasm of respiratory and digestive organs	4412/179817	1.01(1.00,1.01)	0.040
C79 Secondary malignant neoplasm of other sites	3984/179887	1.00(1.00,1.01)	0.169
C80 Malignant neoplasm without specification of site	975/179918	1.01(1.00,1.02)	0.198
Lymphoid, haematopoietic and related tissue			
C81 Hodgkin's disease	118/179946	0.99(0.95,1.03)	0.529
C82 Follicular [nodular] non-Hodgkin's lymphoma	225/179916	1.02(0.99,1.04)	0.218
C83 Diffuse non-Hodgkin's lymphoma	689/179867	0.99(0.98,1.01)	0.325
C85 Other and unspecified types of non-Hodgkin's lymphoma	632/179708	1.00(0.98,1.01)	0.712
C86 Other specified types of T/NK-cell lymphoma	32/180015	1.04(0.96,1.12)	0.313
C88 Malignant immunoproliferative diseases	109/180003	0.96(0.93,1.00)	0.059
C90 Multiple myeloma and malignant plasma cell neoplasms	545/179909	1.00(0.98,1.02)	0.987
C91 Lymphoid leukaemia	522/179852	0.99(0.98,1.01)	0.526
C92 Myeloid leukaemia	369/179929	1.01(0.99,1.04)	0.189
C94 Other leukaemias of specified cell type	30/180015	1.00(0.93,1.07)	0.934
Primary multiple sites			
C97 Malignant neoplasms of independent primary multiple sites	677/180015	1.00(0.99,1.02)	0.720

Supplementary Table 9. Multi-variable logistic regression analysis for risk of cancers associated with psoriasis PRSs (Female).

All statistical tests are two-sided and unadjusted for multiple comparisons.

Cancer	Case/Total	OR (95%CI)	p value
Lip, oral cavity and pharynx			
C00 Malignant neoplasm of lip	31/207693	1.04(0.96,1.11)	0.336
C02 Malignant neoplasm of other and unspecified parts of tongue	71/207673	1.04(1.00,1.09)	0.065
C06 Malignant neoplasm of other and unspecified parts of mouth	27/207691	1.00(0.93,1.08)	0.921
C07 Malignant neoplasm of parotid gland	39/207686	0.94(0.88,1.00)	0.061
C09 Malignant neoplasm of tonsil	59/207683	1.01(0.96,1.06)	0.767
Digestive organs			
C15 Malignant neoplasm of oesophagus	338/207668	1.00(0.98,1.02)	0.931
C16 Malignant neoplasm of stomach	262/207663	1.01(0.99,1.04)	0.416
C17 Malignant neoplasm of small intestine	115/207678	0.99(0.95,1.02)	0.493
C18 Malignant neoplasm of colon	1808/207262	1.00(0.99,1.01)	0.747
C19 Malignant neoplasm of rectosigmoid junction	332/207587	1.00(0.97,1.02)	0.701
C20 Malignant neoplasm of rectum	632/207468	0.99(0.98,1.01)	0.522
C21 Malignant neoplasm of anus and anal canal	153/207657	1.03(0.99,1.06)	0.139
C22 Malignant neoplasm of liver and intrahepatic bile ducts	279/207690	1.00(0.97,1.02)	0.694
C23 Malignant neoplasm of gallbladder	82/207699	0.99(0.95,1.04)	0.786
C24 Malignant neoplasm of other and unspecified parts of biliary tract	119/207690	1.00(0.96,1.04)	0.911
C25 Malignant neoplasm of pancreas	612/207677	0.98(0.97,1.00)	0.065
C26 Malignant neoplasm of other and ill-defined digestive organs	99/207685	1.01(0.97,1.05)	0.657
Respiratory system and intrathoracic organs			
C32 Malignant neoplasm of larynx	26/207688	0.95(0.87,1.03)	0.184
C34 Malignant neoplasm of bronchus and lung	1874/207604	1.00(1.00,1.01)	0.325
C38 Malignant neoplasm of heart, mediastinum and pleura	30/207698	0.97(0.90,1.04)	0.413
Bone and articular cartilage			
C41 Malignant neoplasm of bone and articular cartilage of other and unspecified sites	38/207688	0.96(0.90,1.03)	0.259
Skin			
C43 Malignant melanoma of skin	1257/207166	0.99(0.98,1.00)	0.094
C44 Other malignant neoplasms of skin	6757/205651	1.00(1.00,1.01)	0.138
Mesothelial and soft tissue			
C45 Mesothelioma	82/207701	1.02(0.97,1.07)	0.428
C48 Malignant neoplasm of retroperitoneum and peritoneum	248/207676	1.00(0.97,1.02)	0.718
C49 Malignant neoplasm of other connective and soft tissue	129/207644	1.00(0.97,1.04)	0.795
Breast			
C50 Malignant neoplasm of breast	8259/202524	1.01(1.00,1.01)	0.018
Female genital organs			
C51 Malignant neoplasm of vulva	130/207658	1.01(0.98,1.05)	0.488
C53 Malignant neoplasm of cervix uteri	147/207547	0.98(0.95,1.01)	0.224
C54 Malignant neoplasm of corpus uteri	1341/207173	1.00(0.99,1.01)	0.709
C55 Malignant neoplasm of uterus, part unspecified	150/207658	0.98(0.95,1.01)	0.266
C56 Malignant neoplasm of ovary	1024/207325	1.00(0.98,1.01)	0.692
C57 Malignant neoplasm of other and unspecified female genital organs	192/207689	1.00(0.97,1.03)	0.768
Urinary tract			
C64 Malignant neoplasm of kidney, except renal pelvis	482/207593	1.01(0.99,1.03)	0.277
C66 Malignant neoplasm of ureter	52/207695	1.00(0.95,1.06)	0.888
C67 Malignant neoplasm of bladder	622/207516	1.01(0.99,1.02)	0.471
Central nervous system			
C69 Malignant neoplasm of eye and adnexa	56/207650	0.98(0.93,1.04)	0.522
C71 Malignant neoplasm of brain	342/207660	1.00(0.97,1.02)	0.790
Endocrine glands			
C73 Malignant neoplasm of thyroid gland	234/207569	0.98(0.96,1.01)	0.261
Ill-defined, secondary and unspecified sites			
C76 Malignant neoplasm of other and ill-defined sites	79/207682	0.98(0.93,1.02)	0.322
C77 Secondary and unspecified malignant neoplasm of lymph nodes	4448/206484	1.00(1.00,1.01)	0.529
C78 Secondary malignant neoplasm of respiratory and digestive organs	4812/207435	1.00(0.99,1.01)	0.961
C79 Secondary malignant neoplasm of other sites	3443/207485	1.01(1.00,1.01)	0.092
C80 Malignant neoplasm without specification of site	1059/207586	1.00(0.99,1.02)	0.597
Lymphoid, haematopoietic and related tissue			
C81 Hodgkin's disease	92/207646	0.98(0.94,1.02)	0.277
C82 Follicular [nodular] non-Hodgkin's lymphoma	250/207620	1.02(1.00,1.05)	0.060
C83 Diffuse non-Hodgkin's lymphoma	499/207617	1.00(0.98,1.02)	0.796
C85 Other and unspecified types of non-Hodgkin's lymphoma	499/207477	0.99(0.97,1.01)	0.162
C88 Malignant immunoproliferative diseases	87/207691	0.99(0.95,1.04)	0.684
C90 Multiple myeloma and malignant plasma cell neoplasms	371/207637	0.99(0.96,1.01)	0.185
C91 Lymphoid leukaemia	292/207630	0.98(0.96,1.01)	0.154
C92 Myeloid leukaemia	250/207611	0.99(0.96,1.01)	0.310
Primary multiple sites			
C97 Malignant neoplasms of independent primary multiple sites	456/207702	1.00(0.98,1.02)	0.812

Supplementary Table 10. Tests of heterogeneity for psoriasis as the exposure and cancers as the outcome.

Outcomes	Heterogeneity test			
	MR Egger		IVW	
	Q-statistics	<i>p</i> value	Q-statistics	<i>p</i> value
Anal canal cancer	6.37	0.702	6.42	0.779
Lung cancer	9.41	0.225	9.49	0.303
Nonmelanoma skin cancer	12.73	0.239	15.74	0.151
Breast cancer	7.04	0.933	7.49	0.943
Kidney cancer	13.13	0.069	15.13	0.057
Secondary malignant neoplasm of respiratory and digestive organs	5.61	0.847	5.61	0.898
Secondary malignant neoplasm of other sites	4.32	0.932	6.52	0.837
Follicular [nodular] non-Hodgkin's lymphoma	6.98	0.639	11.39	0.328

All statistical tests are two-sided. Abbreviation: MR-Egger, Mendelian Randomisation-Egger. IVW, Inverse variance weighted.

Supplementary Table 11. Tests of pleiotropy for psoriasis as the exposure and cancers as the outcome.

Outcomes	Pleiotropy test	
	MR-Egger <i>p</i> value	MR-PRESSO <i>p</i> value
Anal canal cancer	0.839	0.873
Lung cancer	0.815	0.160
Nonmelanoma skin cancer	0.155	0.064
Breast cancer	0.512	0.111
Kidney cancer	0.335	0.210
Secondary malignant neoplasm of respiratory and digestive organs	0.975	0.798
Secondary malignant neoplasm of other sites	0.169	0.584
Follicular [nodular] non-Hodgkin's lymphoma	0.065	0.347

All statistical tests are two-sided. Abbreviation: MR-Egger, Mendelian Randomisation-Egger. MR-PRESSO, MR-pleiotropy residual sum and outlier.

Supplementary Table 12. The association of SNPs included as the instrument variables in two-sample Mendelian randomization analysis with breast and lung cancer.

SNP	Lung cancer		Breast cancer	
	OR (95%CI)	<i>p</i> value	OR (95%CI)	<i>p</i> value
rs10829130	0.99(0.93,1.05)	0.797	0.99(0.96,1.03)	0.621
rs2021511	0.97(0.92,1.01)	0.114	1.00(0.97,1.02)	0.810
rs138009430	0.92(0.23,3.73)	0.910	0.38(0.12,1.19)	0.096
rs28998802	0.99(0.93,1.05)	0.720	0.98(0.94,1.01)	0.145
rs12713428	0.97(0.92,1.01)	0.151	1.01(0.98,1.04)	0.387
rs17728338	1.01(0.92,1.11)	0.856	1.01(0.96,1.07)	0.752
rs12188300	1.00(0.93,1.07)	0.975	1.03(0.99,1.07)	0.198
rs13210419	1.12(1.04,1.20)	0.003	1.02(0.98,1.07)	0.287
rs9481169	0.97(0.90,1.04)	0.395	1.01(0.97,1.05)	0.615
rs674451	0.99(0.95,1.03)	0.680	0.98(0.95,1.00)	0.079
rs181316459	0.93(0.75,1.15)	0.501	0.95(0.84,1.08)	0.440
rs60600003	0.99(0.93,1.06)	0.800	0.98(0.94,1.01)	0.224

rs4713605, rs1611309, rs28752856, rs4947309 wasn't detected in UKB data. All statistical tests are two-sided and unadjusted for multiple comparisons.

Supplementary Table 13. The association of SNPs included as the instrument variables in two-sample Mendelian randomization analysis with the common risk factors related to breast and lung cancer.

SNP	BMI		Smoking		Oestradiol		SHBG		Testosterone	
	OR(95%CI)	<i>p</i> value	OR(95%CI)	<i>p</i> value	OR(95%CI)	<i>p</i> value	OR(95%CI)	<i>p</i> value	OR(95%CI)	<i>p</i> value
rs10829130	1.00(0.97,1.03)	0.765	0.99(0.97,1.02)	0.567	1.25(0.20,7.89)	0.814	1.04(0.88,1.23)	0.629	1.00(0.98,1.02)	0.901
rs2021511	1.02(0.99,1.04)	0.177	1.01(0.99,1.03)	0.213	9.42(2.45,36.24)	0.001	1.07(0.95,1.20)	0.294	1.00(0.98,1.01)	0.593
rs138009430	1.01(0.53,1.91)	0.982	1.11(0.71,1.73)	0.639	NA	NA	1.46(0.05,46.54)	0.831	0.87(0.55,1.36)	0.529
rs28998802	1.00(0.97,1.03)	0.910	1.00(0.98,1.02)	0.916	4.17(0.70,24.91)	0.117	1.02(0.87,1.19)	0.816	1.00(0.98,1.02)	0.688
rs12713428	0.99(0.96,1.01)	0.212	0.99(0.98,1.01)	0.538	3.34(0.79,14.11)	0.101	1.03(0.91,1.17)	0.612	1.00(0.98,1.01)	0.703
rs17728338	1.03(0.99,1.08)	0.164	0.97(0.94,1.01)	0.112	0.70(0.04,12.61)	0.810	0.80(0.62,1.03)	0.089	0.96(0.93,0.99)	0.020
rs12188300	0.95(0.91,0.98)	0.001	0.99(0.97,1.02)	0.629	2.50(0.32,19.76)	0.384	1.08(0.90,1.30)	0.383	1.01(0.99,1.04)	0.317
rs13210419	1.08(1.04,1.12)	<i>p</i> < 0.001	1.03(1.01,1.06)	0.019	0.61(0.06,6.20)	0.672	0.63(0.51,0.77)	<i>p</i> < 0.001	0.97(0.95,1.00)	0.035
rs9481169	0.99(0.95,1.02)	0.538	1.00(0.97,1.02)	0.725	0.95(0.11,8.37)	0.963	0.97(0.80,1.18)	0.769	0.97(0.95,1.00)	0.027
rs674451	1.00(0.98,1.02)	0.779	1.01(1.00,1.03)	0.116	0.79(0.22,2.87)	0.722	0.86(0.77,0.96)	0.009	0.99(0.98,1.01)	0.340
rs181316459	0.90(0.82,1.00)	0.054	1.08(1.00,1.16)	0.041	0.75(0.00,416.27)	0.928	1.63(0.93,2.85)	0.085	1.08(1.00,1.16)	0.042
rs60600003	1.01(0.97,1.04)	0.726	1.02(1.00,1.05)	0.081	0.76(0.10,5.82)	0.795	1.06(0.88,1.26)	0.557	1.00(0.98,1.02)	0.981

rs4713605, rs1611309, rs28752856, rs4947309 wasn't detected in UKB data. For Smoking, the reference is Never and the value is Current. All statistical tests are two-sided and unadjusted for multiple comparisons. Abbreviation: BMI, body mass index. SHBG, sex hormone-binding globulin.

Supplementary Table 14. eQTL analysis revealing associations between psoriasis-related SNPs and corresponding protein-coding genes in lung tissues from GTEx.

SNP	Gencode Id	Gene Symbol	Variant Id	<i>p</i> value	NES	Tissue
rs30376	ENSG00000164307.12	ERAP1	chr5_96784555_C_T_b38	4.60E-37	-0.53	Lung
rs3093661	ENSG00000204516.9	MICB	chr6_31575981_G_A_b38	9.50E-21	-0.83	Lung
rs33980500	ENSG00000255389.1	C6orf3	chr6_111592059_C_T_b38	9.40E-42	-0.83	Lung
rs4406273	ENSG00000225851.1	HLA-S	chr6_31298313_G_A_b38	8.80E-21	0.91	Lung
	ENSG00000204538.3	PSORS1C2	chr6_31298313_G_A_b38	5.20E-13	0.71	Lung
	ENSG00000234745.10	HLA-B	chr6_31298313_G_A_b38	8.00E-11	0.27	Lung
rs28780087	ENSG00000281831.1	HCP5B	chr6_30141996_G_A_b38	3.40E-17	0.90	Lung
	ENSG00000204644.9	ZFP57	chr6_30141996_G_A_b38	1.20E-16	1.00	Lung
rs9399137	ENSG00000118514.13	ALDH8A1	chr6_135097880_T_C_b38	1.60E-14	-0.49	Lung
rs9267536	ENSG00000250535.1	STK19B	chr6_31683417_A_C_b38	2.80E-17	1.10	Lung
rs1233391	ENSG00000281831.1	HCP5B	chr6_29582841_T_C_b38	1.00E-10	0.42	Lung
rs28732201	ENSG00000204516.9	MICB	chr6_32382677_G_A_b38	2.10E-10	-0.55	Lung
rs9468830	ENSG00000137312.14	FLOT1	chr6_30781935_T_G_b38	2.00E-15	-0.16	Lung
	ENSG00000228022.5	HCG20	chr6_30781935_T_G_b38	2.70E-13	-0.42	Lung
	ENSG00000204538.3	PSORS1C2	chr6_30781935_T_G_b38	7.70E-11	0.40	Lung
rs12215079	ENSG00000250535.1	STK19B	chr6_32412901_C_A_b38	7.80E-18	1.40	Lung
rs17195173	ENSG00000181126.13	HLA-V	chr6_30446311_G_A_b38	4.10E-12	0.85	Lung
rs2647089	ENSG00000196735.11	HLA-DQA1	chr6_32713791_T_C_b38	3.50E-12	-0.29	Lung
	ENSG00000179344.16	HLA-DQB1	chr6_32713791_T_C_b38	1.60E-11	-0.31	Lung
	ENSG00000232629.8	HLA-DQB2	chr6_32713791_T_C_b38	1.40E-10	0.36	Lung
rs28780100	ENSG00000206341.7	HLA-H	chr6_30406108_C_T_b38	4.60E-11	1.00	Lung
rs9525864	ENSG00000151773.12	CCDC122	chr13_43883475_A_G_b38	2.50E-13	-0.48	Lung
rs11648503	ENSG00000184939.15	ZFP90	chr16_68565035_G_A_b38	5.30E-29	0.37	Lung
rs11652075	ENSG00000141527.16	CARD14	chr17_80205094_C_T_b38	1.00E-12	-0.28	Lung
	ENSG00000181523.12	SGSH	chr17_80205094_C_T_b38	1.10E-10	-0.18	Lung

All statistical tests are two-sided and unadjusted for multiple comparisons. Abbreviation: SNP, single nucleotide polymorphisms. NES, normalized effect size.

Supplementary Table 15. eQTL analysis revealing associations between psoriasis-related SNPs and corresponding protein-coding genes in breast tissues from GTEx.

SNP	Gencode Id	Gene Symbol	Variant Id	<i>p</i> value	NES	Tissue
rs30376	ENSG00000164307.12	ERAP1	chr5_96784555_C_T_b38	1.10E-20	-0.34	Breast
rs3093661	ENSG00000204516.9	MICB	chr6_31575981_G_A_b38	4.40E-11	-0.67	Breast
rs33980500	ENSG00000255389.1	C6orf3	chr6_111592059_C_T_b38	1.20E-33	-1.00	Breast
rs4406273	ENSG00000204536.13	CCHCR1	chr6_31298313_G_A_b38	8.70E-13	0.36	Breast
	ENSG00000225851.1	HLA-S	chr6_31298313_G_A_b38	2.20E-11	0.73	Breast
	ENSG00000204538.3	PSORS1C2	chr6_31298313_G_A_b38	2.60E-11	0.65	Breast
rs28780087	ENSG00000281831.1	HCP5B	chr6_30141996_G_A_b38	1.50E-11	0.87	Breast
	ENSG00000204644.9	ZFP57	chr6_30141996_G_A_b38	1.70E-11	0.87	Breast
rs9399137	ENSG00000118514.13	ALDH8A1	chr6_135097880_T_C_b38	4.60E-14	-0.50	Breast
	ENSG00000112339.14	HBS1L	chr6_135097880_T_C_b38	7.40E-11	-0.25	Breast
rs9267536	ENSG00000250535.1	STK19B	chr6_31683417_A_C_b38	8.00E-15	1.10	Breast
rs12215079	ENSG00000250535.1	STK19B	chr6_32412901_C_A_b38	2.00E-15	1.30	Breast
rs17195173	ENSG00000181126.13	HLA-V	chr6_30446311_G_A_b38	1.80E-16	1.50	Breast
rs2647089	ENSG00000232629.8	HLA-DQB2	chr6_32713791_T_C_b38	2.80E-12	0.55	Breast
rs9525864	ENSG00000151773.12	CCDC122	chr13_43883475_A_G_b38	2.40E-14	-0.66	Breast
rs11652075	ENSG00000181523.12	SGSH	chr17_80205094_C_T_b38	1.20E-10	-0.17	Breast

All statistical tests are two-sided and unadjusted for multiple comparisons. Abbreviation: SNP, single nucleotide polymorphisms. NES, normalized effect size.

Supplementary Table 16. The ICD codes for psoriasis, cancers and excluded diseases in UK Biobank.

Phenotype	Codes
Psoriasis	L40
Cancers	
Lip, oral cavity and pharynx	
Malignant neoplasm of lip	C00
Malignant neoplasm of base of tongue	C01
Malignant neoplasm of other and unspecified parts of tongue	C02
Malignant neoplasm of gum	C03
Malignant neoplasm of floor of mouth	C04
Malignant neoplasm of palate	C05
Malignant neoplasm of other and unspecified parts of mouth	C06
Malignant neoplasm of parotid gland	C07
Malignant neoplasm of other and unspecified major salivary glands	C08
Malignant neoplasm of tonsil	C09
Malignant neoplasm of oropharynx	C10
Malignant neoplasm of nasopharynx	C11
Malignant neoplasm of pyriform sinus	C12
Malignant neoplasm of hypopharynx	C13
Malignant neoplasm of other and ill-defined sites in the lip, oral cavity and pharynx	C14
Digestive organs	
Malignant neoplasm of oesophagus	C15
Malignant neoplasm of stomach	C16
Malignant neoplasm of small intestine	C17
Malignant neoplasm of colon	C18
Malignant neoplasm of rectosigmoid junction	C19
Malignant neoplasm of rectum	C20
Malignant neoplasm of anus and anal canal	C21
Malignant neoplasm of liver and intrahepatic bile ducts	C22
Malignant neoplasm of gallbladder	C23
Malignant neoplasm of other and unspecified parts of biliary tract	C24
Malignant neoplasm of pancreas	C25
Malignant neoplasm of other and ill-defined digestive organs	C26
Respiratory system and intrathoracic organs	
Malignant neoplasm of nasal cavity and middle ear	C30
Malignant neoplasm of accessory sinuses	C31
Malignant neoplasm of larynx	C32
Malignant neoplasm of trachea	C33
Malignant neoplasm of bronchus and lung	C34
Malignant neoplasm of thymus	C37
Malignant neoplasm of heart, mediastinum and pleura	C38
Malignant neoplasm of other and ill-defined sites in the respiratory system and intrathoracic organs	C39
Bone and articular cartilage	
Malignant neoplasm of bone and articular cartilage of limbs	C40
Malignant neoplasm of bone and articular cartilage of other and unspecified sites	C41
Skin	
Malignant melanoma of skin	C43
Other malignant neoplasms of skin	C44
Mesothelial and soft tissue	
Mesothelioma	C45
Kaposi's sarcoma	C46
Malignant neoplasm of peripheral nerves and autonomic nervous system	C47
Malignant neoplasm of retroperitoneum and peritoneum	C48
Malignant neoplasm of other connective and soft tissue	C49
Breast	
Malignant neoplasm of breast	C50
Female genital organs	
Malignant neoplasm of vulva	C51
Malignant neoplasm of vagina	C52
Malignant neoplasm of cervix uteri	C53
Malignant neoplasm of corpus uteri	C54
Malignant neoplasm of uterus, part unspecified	C55
Malignant neoplasm of ovary	C56
Malignant neoplasm of other and unspecified female genital organs	C57

Malignant neoplasm of placenta	C58
Male genital organs	
Malignant neoplasm of penis	C60
Malignant neoplasm of prostate	C61
Malignant neoplasm of testis	C62
Malignant neoplasm of other and unspecified male genital organs	C63
Urinary tract	
Malignant neoplasm of kidney, except renal pelvis	C64
Malignant neoplasm of renal pelvis	C65
Malignant neoplasm of ureter	C66
Malignant neoplasm of bladder	C67
Malignant neoplasm of other and unspecified urinary organs	C68
Central nervous system	
Malignant neoplasm of eye and adnexa	C69
Malignant neoplasm of meninges	C70
Malignant neoplasm of brain	C71
Malignant neoplasm of spinal cord, cranial nerves and other parts of central nervous system	C72
Endocrine glands	
Malignant neoplasm of thyroid gland	C73
Malignant neoplasm of adrenal gland	C74
Malignant neoplasm of other endocrine glands and related structures	C75
Ill-defined, secondary and unspecified sites	
Malignant neoplasm of other and ill-defined sites	C76
Secondary and unspecified malignant neoplasm of lymph nodes	C77
Secondary malignant neoplasm of respiratory and digestive organs	C78
Secondary malignant neoplasm of other sites	C79
Malignant neoplasm without specification of site	C80
Lymphoid, haematopoietic and related tissue	
Hodgkin's disease	C81
Follicular [nodular] non-Hodgkin's lymphoma	C82
Diffuse non-Hodgkin's lymphoma	C83
Peripheral and cutaneous T-cell lymphomas	C84
Other and unspecified types of non-Hodgkin's lymphoma	C85
Other specified types of T/NK-cell lymphoma	C86
Malignant immunoproliferative diseases	C88
Multiple myeloma and malignant plasma cell neoplasms	C90
Lymphoid leukaemia	C91
Myeloid leukaemia	C92
Monocytic leukaemia	C93
Other leukaemias of specified cell type	C94
Leukaemia of unspecified cell type	C95
Other and unspecified malignant neoplasms of lymphoid, haematopoietic and related tissue	C96
Primary multiple sites	
Malignant neoplasms of primary multiple sites	C97
Excluded autoimmune disease	
Multiple sclerosis	G35
Crohn's disease and ulcerative colitis	K50, K51
Pemphigus, pemphigoid and lupus erythematosus	L10, L12, L93
Dermatopolymyositis	M33
Systemic lupus erythematosus	M32
Rheumatoid arthritis	M05, M06
Necrotizing vasculopathies	M30, M31
Systemic sclerosis	M34
Other systemic connective tissue disorders	M35, M36

Supplementary Table 17. Confounding factor definitions

Cancer code	Confounding factors	Source and definition	UK Biobank field code
	Age	UK Biobank baseline characteristics. Age of attending an initial assessment centre.	21022
	Sex	UK Biobank baseline characteristics. Sex based on self-reporting.	31
	Race	Biobank Touchscreen questionnaire at baseline. Ethnic background asked during the initial assessment centre visit	21000
	BMI	UK Biobank baseline physical measures. BMI value is measured during the initial assessment centre visit.	21001
C00-C26, C30-C39, C40-C41, C43-C44, C45-C58, C60-C97	Smoking status	UK Biobank Touchscreen questionnaire at baseline. Smoking status was defined as current, previous, never smoker.	20116
	Alcohol intake frequency	UK Biobank Touchscreen questionnaire at baseline. Alcohol intake frequency was defined as daily or almost daily, three or four times a week, once or twice a week, one to three times a month, special occasions only and never.	1558
	Physical activity	UK Biobank Touchscreen questionnaire at baseline. Physical activity was defined as specifically low intensity, moderate intensity, and high intensity.	22032
	Medication use (Glucocorticoids) Medication use (Methotrexate) Medication use (Cyclosporine)	UK Biobank Verbal interview at baseline. Medication use was defined as whether the corresponding medication is/was used or not.	20003
C43-C44	Sun exposure	UK Biobank Touchscreen questionnaire at baseline. Sun exposure was defined as the total hours spend outdoors in a typical day in summer and in winter.	1050, 1060
	Age at menarche	UK Biobank Touchscreen questionnaire at baseline. Age when periods started.	2714
C50-C58	Number of live births	UK Biobank Touchscreen questionnaire at baseline.	2734
	Menopausal status	UK Biobank Touchscreen questionnaire at baseline. Menopausal status was defined as yes, and other response.	2724
	Red meat intake levels	UK Biobank Touchscreen questionnaire at baseline. Red meat intake levels were defined as the median data of beef, lamb/mutton and pork intake.	1369, 1379, 1389
C18-C20	Fiber intake levels	UK Biobank Touchscreen questionnaire at baseline. Fiber intake levels were defined as the median data of cooked vegetable and salad/raw vegetable intake.	1289, 1299

BMI, body mass index.

Supplementary Table 18. Characteristics of the 74 SNPs included as the instrument variables in the PheWAS of psoriasis PRS and one-sample Mendelian Randomization analysis.

SNP	EA	OA	BETA	SE	MAF	p value
rs12135210	T	G	-1.09	0.19	0.02	8.03E-09
rs4845454	T	C	0.27	0.03	0.35	1.98E-15
rs61774731	A	G	-2.63	0.29	0.09	6.35E-20
rs77520588	A	G	-1.63	0.21	0.03	5.94E-15
rs78636848	A	C	-1.65	0.24	0.02	1.58E-11
rs80174646	T	G	-0.45	0.08	0.07	4.55E-09
rs13394291	C	T	-1.75	0.21	0.04	2.98E-16
rs1990760	T	C	0.19	0.03	0.41	1.95E-08
rs268877	G	A	2.35	0.40	0.02	3.06E-09
rs6714339	T	C	-0.37	0.06	0.13	2.07E-10
rs6755395	G	A	-1.80	0.30	0.03	1.09E-09
rs74864202	A	C	-3.61	0.46	0.02	4.98E-15
rs78580783	C	A	-1.36	0.21	0.02	8.24E-11
rs116054851	C	A	-3.77	0.43	0.02	3.08E-18
rs3135952	T	C	-1.93	0.23	0.03	2.46E-17
rs6833586	G	A	-4.16	0.56	0.02	7.42E-14
rs72669160	C	T	-0.45	0.07	0.12	8.66E-12
rs114071237	T	G	-1.33	0.20	0.02	3.39E-11
rs114835245	G	A	-0.99	0.15	0.03	2.19E-11
rs141417497	A	G	-3.49	0.50	0.03	4.42E-12
rs17728338	A	G	0.45	0.06	0.05	7.42E-15
rs30376	T	C	-0.21	0.03	0.28	5.11E-10
rs4921224	T	C	-0.23	0.03	0.33	3.59E-12
rs10947129	A	G	0.20	0.03	0.15	1.01E-09
rs113866081	A	G	-1.73	0.23	0.03	3.63E-14
rs12215079	A	C	0.91	0.07	0.02	5.61E-44
rs1233391	C	T	0.37	0.04	0.20	3.57E-23
rs13210132	G	A	1.26	0.05	0.06	7.36E-143
rs17066690	C	A	-2.69	0.35	0.02	1.89E-14
rs17195173	A	G	0.87	0.09	0.01	1.08E-23
rs2647089	C	T	0.41	0.03	0.26	1.32E-40
rs28732201	A	G	1.10	0.06	0.04	7.90E-70
rs28780087	A	G	0.78	0.05	0.07	4.69E-48
rs28780100	T	C	1.12	0.06	0.04	2.64E-68
rs3093661	A	G	1.29	0.06	0.04	5.65E-105
rs33980500	T	C	0.43	0.05	0.08	3.64E-19
rs34241101	T	G	1.08	0.05	0.07	2.72E-125
rs4406273	A	G	1.44	0.04	0.09	1.00E-200
rs62421044	A	G	-0.28	0.05	0.14	1.70E-08
rs635688	C	T	-0.24	0.03	0.41	7.43E-13
rs67543742	G	A	0.21	0.04	0.22	9.82E-09
rs68191	C	T	0.29	0.05	0.10	2.76E-10
rs77464075	T	C	-1.79	0.30	0.02	2.47E-09
rs9267536	C	A	0.65	0.06	0.04	5.50E-30
rs9399137	C	T	-0.25	0.04	0.25	8.92E-10
rs9461362	T	C	0.24	0.04	0.14	9.12E-11
rs9468487	G	A	0.35	0.05	0.06	5.52E-11
rs9468830	G	T	0.49	0.03	0.29	1.33E-54
rs146281313	C	A	-4.61	0.40	0.04	1.28E-30
rs2329570	C	T	-4.30	0.58	0.05	9.82E-14
rs73695700	A	G	0.89	0.11	0.02	3.36E-15
rs77840275	C	T	-0.44	0.07	0.08	3.03E-10
rs73246593	T	C	-0.63	0.10	0.06	1.06E-09
rs73277117	C	A	-3.65	0.49	0.02	1.22E-13
rs76930577	C	T	-3.65	0.38	0.03	8.25E-22
rs117505735	A	C	-2.13	0.38	0.01	3.30E-08
rs117950837	C	A	-1.17	0.21	0.02	3.67E-08
rs7865117	T	G	-2.73	0.42	0.03	9.03E-11
rs117135073	T	C	-2.42	0.35	0.02	2.20E-12
rs116976310	C	A	-1.50	0.26	0.02	4.45E-09

rs2277268	A	G	-0.47	0.08	0.07	2.54E-08
rs57939339	A	G	-1.49	0.22	0.02	2.52E-11
rs75430970	C	T	-0.28	0.05	0.16	1.81E-09
rs4768259	A	C	-1.88	0.28	0.02	1.19E-11
rs9525864	G	A	-0.55	0.06	0.08	1.51E-18
rs11648503	A	G	0.26	0.04	0.23	7.58E-10
rs12447534	T	C	-0.18	0.03	0.40	2.47E-08
rs34413922	T	C	-1.91	0.22	0.03	1.06E-18
rs11652075	T	C	-0.17	0.03	0.50	2.23E-08
rs117094752	C	T	-0.79	0.12	0.03	1.20E-10
rs184983166	A	C	-1.86	0.32	0.02	8.67E-09
rs57009492	T	C	-0.39	0.06	0.10	1.55E-09
rs892085	A	G	0.18	0.03	0.44	4.18E-10
rs6031647	G	A	0.39	0.06	0.07	5.11E-10

All statistical tests are two-sided and unadjusted for multiple comparisons. Abbreviation: SNP, single nucleotide polymorphism. EA, Effect Allele. OA, Other Allele. MAF, minor allele frequencies. SE, standard error

Supplementary Table 19. Annotation of psoriasis-associated 74 SNPs.

SNP	Gene names	Gene type	Gene Function
rs4845454	LCE3A, LCE3B	Protein coding	Innate cutaneous host defense
rs80174646	IL23R	Protein coding	Interleukin-23 receptor subunit
rs1990760	IFIH1	Protein coding	Intracellular sensor of viral RNA
rs30376	ERAP1	Protein coding	Trimming HLA class I-binding precursors
rs3093661	TNF,LTA	Protein coding	Cytokine
rs33980500	TRAF3IP2, TRAF3IP2-AS1	Protein coding	E3 ubiquitin ligase
rs77464075	BACH2	Protein coding	Maintenance of regulatory T-cell function and B-cell maturation
rs9525864	LACC1	Protein coding	Encoding an multifunctional purine enzyme
rs11652075	CARD14, SGSH	Protein coding	Upstream activators of BCL10 and NF-kappaB signaling.
rs77840275	ELMO1	Protein coding	A member of the engulfment and cell motility protein family
rs28780087	TRIM40	Protein coding	E3 ubiquitin ligase
rs635688	BRD2	Protein coding	Transcriptional regulator
rs61774731	RUNX3	Protein coding	Recognizing the core consensus binding sequence
rs75430970	EMSY	Protein coding	Transcription Regulator
rs11648503	ZFP90	Protein coding	NRSF silencer factor
rs34413922	SGF29	Protein coding	Chromatin reader component
rs6031647	PKIG	Protein coding	A competitive cAMP-dependent protein kinase inhibitor (Predicted)
rs57009492	CDK12	Protein coding	Cyclin-dependent kinase
rs34241101	SKIC2,STK19,DXO	Protein coding	Helicase component of the SKI complex; Regulator of NRAS signaling
rs9399137	HBS1L	Protein coding	GTPase component of the Pelota-HBS1L complex
rs73695700	FIGNL1,DDC	Protein coding	DNA double-strand break repair; Dopamine biosynthesis
rs9267536	LY6G5C,ABHD16A	Protein coding	GPI-anchored cell surface proteins; Prostaglandin catabolic process
rs2277268	LRP5	Protein coding	A coreceptor with members of the frizzled family
rs6714339	USP34	Protein coding	Regulator of Wnt signaling pathway
rs116054851	DOCK3	Protein coding	Guanine nucleotide exchange factor
rs1233391	GABBR1, RPL13AP	Protein coding	Component of a heterodimeric G-protein coupled receptor for GABA
rs3135952	SHISA5,TREX1	Protein coding	Together with p53 induces apoptosis; DNA repair and proofreading for DNA polymerase
rs268877	ACTR2	Protein coding	Major constituent of the ARP2/3 complex
rs78636848	DENND1B	Protein coding	Guanine nucleotide exchange factor
rs57939339	RNH1	Protein coding	Ribonuclease inhibitor
rs892085	QTRT1	Protein coding	Encoding the catalytic subunit of tRNA-guanine transglycosylase
rs4768259	MUC19	Protein coding	Function in ocular mucus homeostasis (Predicted)
rs13210132	MUC22	Protein coding	Component of membrane (Predicted)
rs116976310	IFT46	Protein coding	Part of a complex involved in intraflagellar transport
rs114835245	TTC33	Protein coding	Unknown
rs117135073	ZNF365	Protein coding	Uric acid excretion (Predicted)
rs117094752	NOS2	Protein coding	Produces nitric oxide
rs184983166	CCL11	Protein coding	Eotaxin
rs17728338	ANXA6	Protein coding	Associate with CD21 (Predicted)
rs4406273	LINC02571	Non-coding	Influence the expression levels of HLA-C class I molecules in immune and resident skin cells
rs4921224	ENSG00000249738	Non-coding	
rs17066690	LINC03004	Non-coding	
rs28732201	TSBP1-AS1	Non-coding	
rs9468487	ENSG00000290479	Non-coding	
rs9468830	HCG20	Non-coding	
rs2329570	ENSG00000228204	Non-coding	
rs7865117	ENSG00000287368	Non-coding	
rs73277117	ENSG00000253553	Non-coding	Antisense to MMP16
rs76930577	ENSG00000286675	Non-coding	
rs12135210	Unknown		
rs77520588	Unknown		
rs13394291	Unknown		
rs6755395	Unknown		
rs74864202	Unknown		
rs78580783	Unknown		
rs6833586	Unknown		
rs72669160	Unknown		
rs114071237	Unknown		
rs141417497	Unknown		
rs12447534	Unknown		

rs10947129	Unknown
rs113866081	Unknown
rs12215079	Unknown
rs17195173	Unknown
rs2647089	Unknown
rs28780100	Unknown
rs62421044	Unknown
rs67543742	Unknown
rs68191	Unknown
rs9461362	Unknown
rs146281313	Unknown
rs73246593	Unknown
rs117505735	Unknown
rs117950837	Unknown

Abbreviation: SNP, single nucleotide polymorphism. BCL10, B-cell lymphoma 10. NRAS, GTPase NRas. GPI, glycosylphosphatidylinositol. GABA, gamma-aminobutyric acid. ARP, actin-related proteins.

Supplementary table 20. Characteristics of the 11 SNPs included as the instrument variables in two-sample Mendelian randomization analysis (Anal canal cancer).

SNP	EA	OA	EAF	Beta	SE	<i>p</i> value
rs10829130	A	G	0.11	0.20	0.04	4.24E-08
rs12188300	T	A	0.06	0.43	0.05	2.24E-18
rs12713428	C	A	0.25	0.17	0.03	8.11E-11
rs13210419	A	G	0.06	1.12	0.05	1.10E-105
rs17728338	A	G	0.07	0.31	0.04	1.76E-12
rs2021511	T	C	0.27	-0.14	0.03	4.75E-08
rs28998802	A	G	0.19	0.17	0.03	7.41E-09
rs4713605	A	T	0.33	0.15	0.02	2.35E-10
rs60600003	G	T	0.10	0.21	0.04	1.03E-08
rs674451	C	T	0.34	0.13	0.02	2.82E-08
rs9481169	T	G	0.08	0.25	0.04	2.47E-09

All statistical tests are two-sided and unadjusted for multiple comparisons. Abbreviation: SNP, single nucleotide polymorphism. EA, Effect Allele. OA, Other Allele. EAF, effect allele frequencies. SE, standard error.

Supplementary table 21. Characteristics of the 9 SNPs included as the instrument variables in two-sample Mendelian randomization analysis (Lung cancer).

SNP	EA	OA	EAF	Beta	SE	<i>p</i> value
rs10829130	A	G	0.11	0.20	0.04	4.24E-08
rs12713428	C	A	0.25	0.17	0.03	8.11E-11
rs13210419	A	G	0.06	1.12	0.05	1.10E-105
rs17728338	A	G	0.07	0.31	0.04	1.76E-12
rs2021511	T	C	0.27	-0.14	0.03	4.75E-08
rs28998802	A	G	0.19	0.17	0.03	7.41E-09
rs60600003	G	T	0.10	0.21	0.04	1.03E-08
rs674451	C	T	0.34	0.13	0.02	2.82E-08
rs9481169	T	G	0.08	0.25	0.04	2.47E-09

All statistical tests are two-sided and unadjusted for multiple comparisons. Abbreviation: SNP, single nucleotide polymorphism. EA, Effect Allele. OA, Other Allele. EAF, effect allele frequencies. SE, standard error.

Supplementary table 22. Characteristics of the 12 SNPs included as the instrument variables in two-sample Mendelian randomization analysis (Nonmelanoma skin cancer).

SNP	EA	OA	EAF	Beta	SE	<i>p</i> value
rs10829130	A	G	0.11	0.20	0.04	4.24E-08
rs12188300	T	A	0.06	0.43	0.05	2.24E-18
rs12713428	C	A	0.25	0.17	0.03	8.11E-11
rs13210419	A	G	0.06	1.12	0.05	1.10E-105
rs1611309	T	C	0.63	0.24	0.03	1.60E-19
rs17728338	A	G	0.07	0.31	0.04	1.76E-12
rs2021511	T	C	0.27	-0.14	0.03	4.75E-08
rs28998802	A	G	0.19	0.17	0.03	7.41E-09
rs4713605	A	T	0.33	0.15	0.02	2.35E-10
rs60600003	G	T	0.10	0.21	0.04	1.03E-08
rs674451	C	T	0.34	0.13	0.02	2.82E-08
rs9481169	T	G	0.08	0.25	0.04	2.47E-09

All statistical tests are two-sided and unadjusted for multiple comparisons. Abbreviation: SNP, single nucleotide polymorphism. EA, Effect Allele. OA, Other Allele. EAF, effect allele frequencies. SE, standard error.

Supplementary table 23. Characteristics of the 16 SNPs included as the instrument variables in two-sample Mendelian randomization analysis (Breast cancer).

SNP	EA	OA	EAF	Beta	SE	p value
rs10829130	A	G	0.11	0.20	0.04	4.24E-08
rs12188300	T	A	0.06	0.43	0.05	2.24E-18
rs12713428	C	A	0.25	0.17	0.03	8.11E-11
rs13210419	A	G	0.06	1.12	0.05	1.10E-105
rs138009430	A	C	0.08	0.25	0.04	1.94E-09
rs1611309	T	C	0.63	0.24	0.03	1.60E-19
rs17728338	A	G	0.07	0.31	0.04	1.76E-12
rs181316459	C	G	0.05	0.35	0.06	1.50E-10
rs2021511	T	C	0.27	-0.14	0.03	4.75E-08
rs28752856	G	C	0.11	0.83	0.04	5.90E-100
rs28998802	A	G	0.19	0.17	0.03	7.41E-09
rs4713605	A	T	0.33	0.15	0.02	2.35E-10
rs4947309	T	A	0.23	0.55	0.03	3.86E-90
rs60600003	G	T	0.10	0.21	0.04	1.03E-08
rs674451	C	T	0.34	0.13	0.02	2.82E-08
rs9481169	T	G	0.08	0.25	0.04	2.47E-09

All statistical tests are two-sided and unadjusted for multiple comparisons. Abbreviation: SNP, single nucleotide polymorphism. EA, Effect Allele. OA, Other Allele. EAF, effect allele frequencies. SE, standard error.

Supplementary table 24. Characteristics of the 9 SNPs included as the instrument variables in two-sample Mendelian randomization analysis (Kidney cancer).

SNP	EA	OA	EAF	Beta	SE	p value
rs10829130	A	G	0.11	0.20	0.04	4.24E-08
rs12713428	C	A	0.25	0.17	0.03	8.11E-11
rs13210419	A	G	0.06	1.12	0.05	1.10E-105
rs17728338	A	G	0.07	0.31	0.04	1.76E-12
rs2021511	T	C	0.27	-0.14	0.03	4.75E-08
rs28998802	A	G	0.19	0.17	0.03	7.41E-09
rs60600003	G	T	0.10	0.21	0.04	1.03E-08
rs674451	C	T	0.34	0.13	0.02	2.82E-08
rs9481169	T	G	0.08	0.25	0.04	2.47E-09

All statistical tests are two-sided and unadjusted for multiple comparisons. Abbreviation: SNP, single nucleotide polymorphism. EA, Effect Allele. OA, Other Allele. EAF, effect allele frequencies. SE, standard error.

Supplementary table 25. Characteristics of the 12 SNPs included as the instrument variables in two-sample Mendelian randomization analysis (Secondary malignant neoplasm of respiratory and digestive organs)

SNP	EA	OA	EAF	Beta	SE	<i>p</i> value
rs10829130	A	G	0.11	0.20	0.04	4.24E-08
rs12188300	T	A	0.06	0.43	0.05	2.24E-18
rs12713428	C	A	0.25	0.17	0.03	8.11E-11
rs13210419	A	G	0.06	1.12	0.05	1.10E-105
rs1611309	T	C	0.63	0.24	0.03	1.60E-19
rs17728338	A	G	0.07	0.31	0.04	1.76E-12
rs2021511	T	C	0.27	-0.14	0.03	4.75E-08
rs28998802	A	G	0.19	0.17	0.03	7.41E-09
rs4713605	A	T	0.33	0.15	0.02	2.35E-10
rs60600003	G	T	0.10	0.21	0.04	1.03E-08
rs674451	C	T	0.34	0.13	0.02	2.82E-08
rs9481169	T	G	0.08	0.25	0.04	2.47E-09

All statistical tests are two-sided and unadjusted for multiple comparisons. Abbreviation: SNP, single nucleotide polymorphism. EA, Effect Allele. OA, Other Allele. EAF, effect allele frequencies. SE, standard error.

Supplementary table 26. Characteristics of the 12 SNPs included as the instrument variables in two-sample Mendelian randomization analysis (Secondary malignant neoplasm of other sites)

SNP	EA	OA	EAF	Beta	SE	<i>p</i> value
rs10829130	A	G	0.11	0.20	0.04	4.24E-08
rs12188300	T	A	0.06	0.43	0.05	2.24E-18
rs12713428	C	A	0.25	0.17	0.03	8.11E-11
rs13210419	A	G	0.06	1.12	0.05	1.10E-105
rs1611309	T	C	0.63	0.24	0.03	1.60E-19
rs17728338	A	G	0.07	0.31	0.04	1.76E-12
rs2021511	T	C	0.27	-0.14	0.03	4.75E-08
rs28998802	A	G	0.19	0.17	0.03	7.41E-09
rs4713605	A	T	0.33	0.15	0.02	2.35E-10
rs60600003	G	T	0.10	0.21	0.04	1.03E-08
rs674451	C	T	0.34	0.13	0.02	2.82E-08
rs9481169	T	G	0.08	0.25	0.04	2.47E-09

All statistical tests are two-sided and unadjusted for multiple comparisons. Abbreviation: SNP, single nucleotide polymorphism. EA, Effect Allele. OA, Other Allele. EAF, effect allele frequencies. SE, standard error.

Supplementary table 27. Characteristics of the 11 SNPs included as the instrument variables in two-sample Mendelian randomization analysis (Follicular [nodular] non-Hodgkin's lymphoma)

SNP	EA	OA	EAF	Beta	SE	p value
rs10829130	A	G	0.11	0.20	0.04	4.24E-08
rs12188300	T	A	0.06	0.43	0.05	2.24E-18
rs12713428	C	A	0.25	0.17	0.03	8.11E-11
rs13210419	A	G	0.06	1.12	0.05	1.10E-105
rs17728338	A	G	0.07	0.31	0.04	1.76E-12
rs2021511	T	C	0.27	-0.14	0.03	4.75E-08
rs28998802	A	G	0.19	0.17	0.03	7.41E-09
rs4713605	A	T	0.33	0.15	0.02	2.35E-10
rs60600003	G	T	0.10	0.21	0.04	1.03E-08
rs674451	C	T	0.34	0.13	0.02	2.82E-08
rs9481169	T	G	0.08	0.25	0.04	2.47E-09

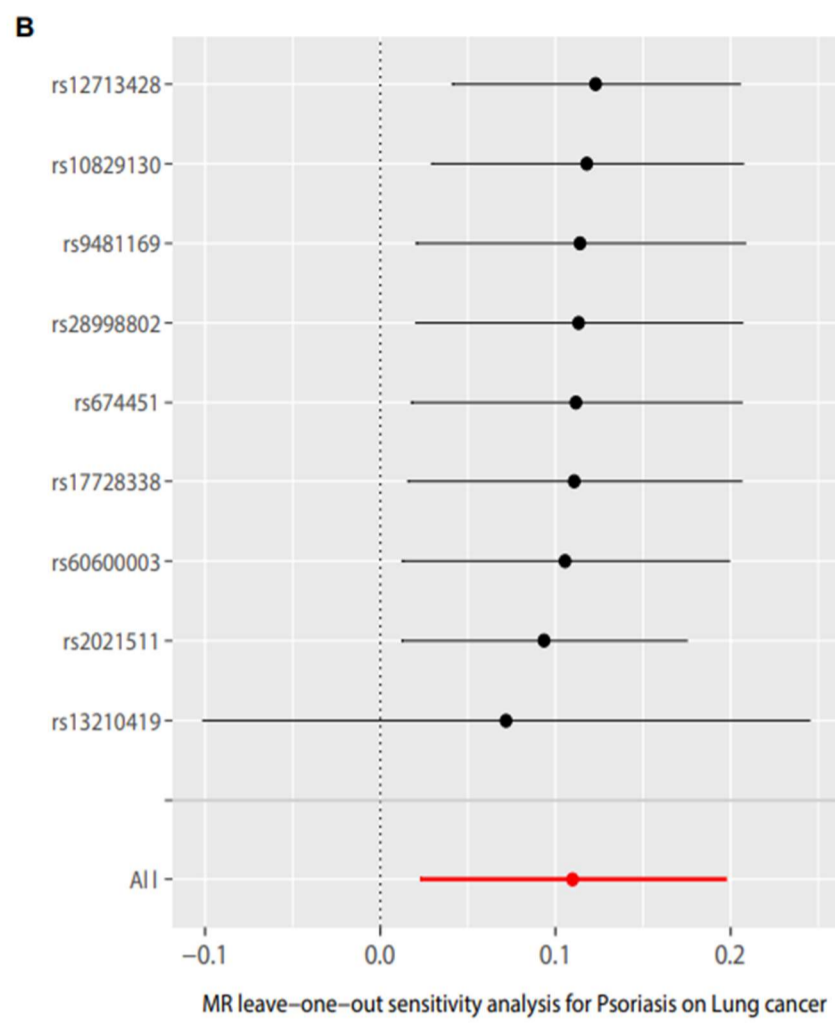
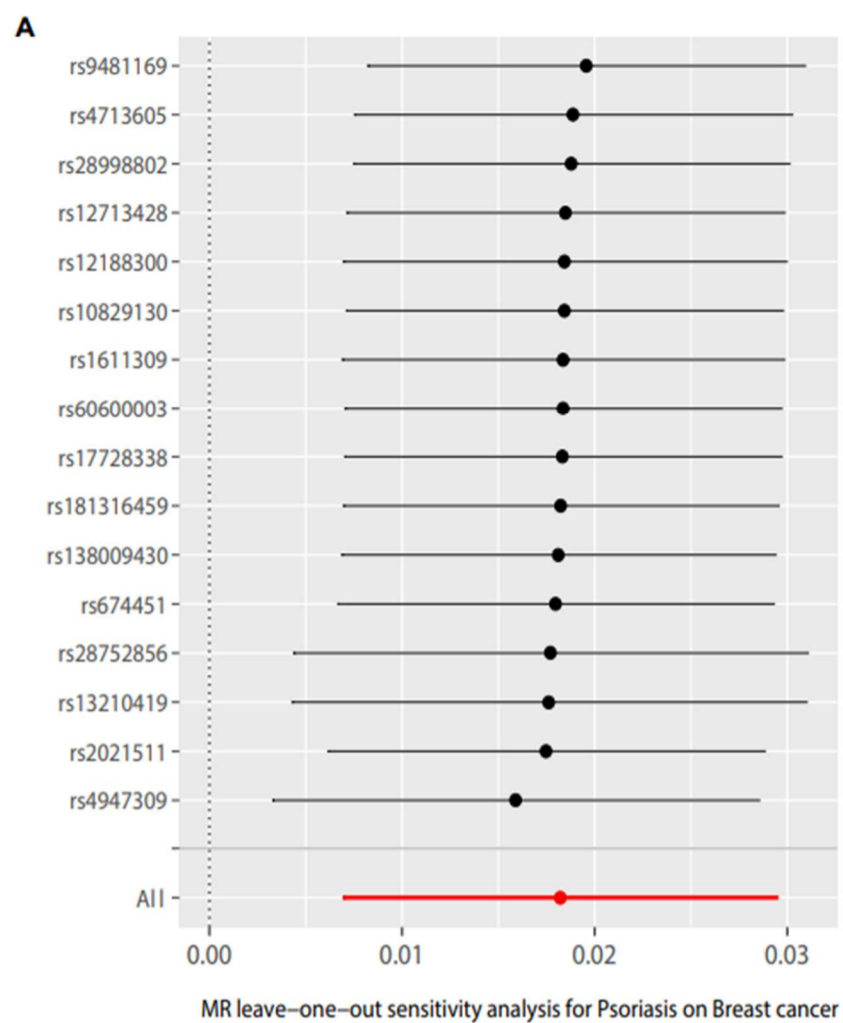
All statistical tests are two-sided and unadjusted for multiple comparisons. Abbreviation: SNP, single nucleotide polymorphism. EA, Effect Allele. OA, Other Allele. EAF, effect allele frequencies. SE, standard error.

Supplementary Table 28. Welch's t-test comparison of gene expression in lung tissues from GTEx and non-small cell lung cancer tissues from TCGA.
 All statistical tests are two-sided.

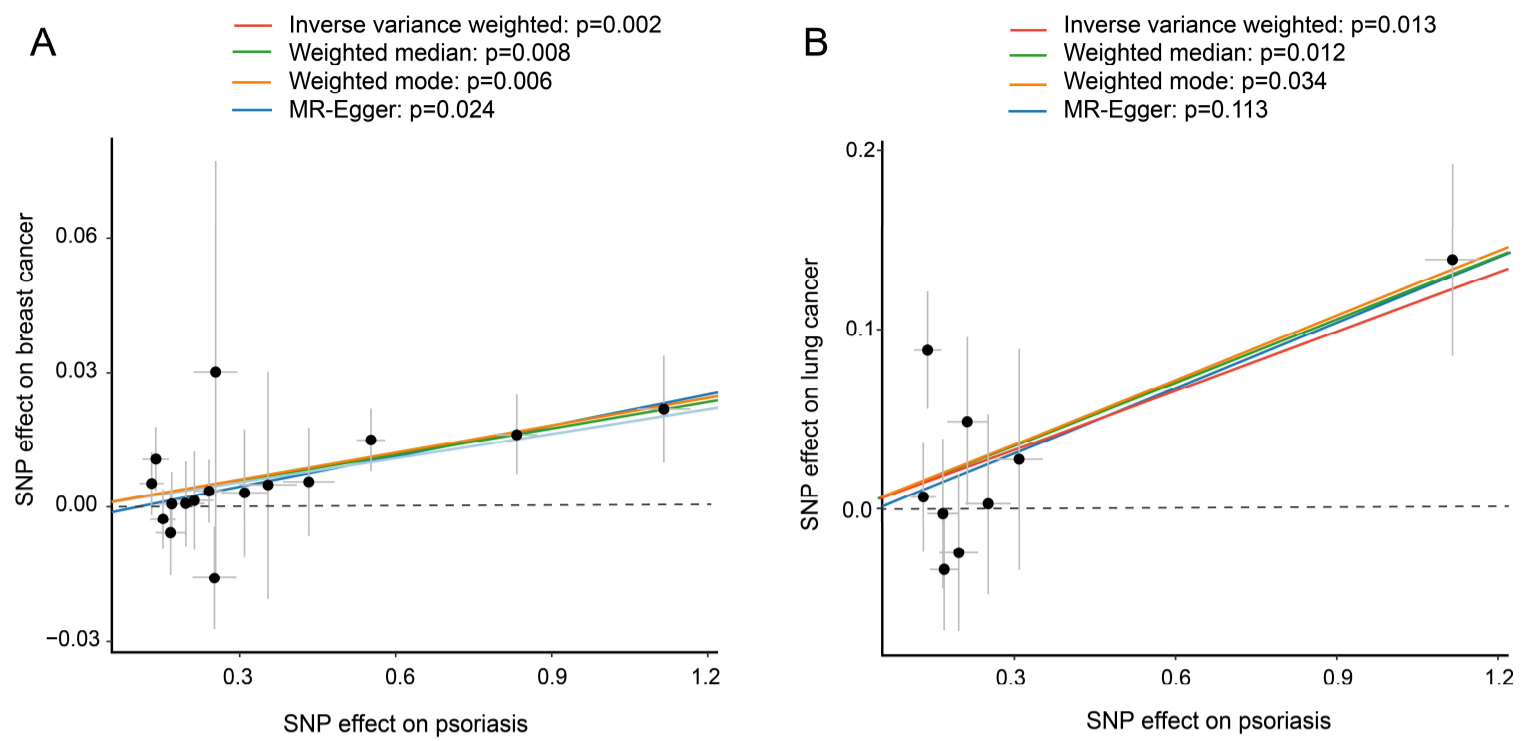
Gene Symbol	Welch's t-test	p value
ERAP1	-7.54	2.22E-13
MICB	-6.89	1.30E-11
C6orf3	-39.65	4.04E-161
PSORS1C2	-2.62	8.89E-03
HLA-B	-6.18	1.35E-09
HCP5B	-15.02	1.92E-41
ZFP57	-2.47	1.38E-02
ALDH8A1	-21.96	6.34E-88
STK19B	-0.50	6.19E-01
FLOT1	-1.08	2.79E-01
HCG20	-1.51	1.31E-01
HLA-V	-31.83	3.04E-149
HLA-DQA1	1.39	1.64E-01
HLA-DQB1	-1.83	6.81E-02
HLA-DQB2	-8.46	1.68E-16
HLA-H	-13.82	7.82E-37
CCDC122	-4.15	3.82E-05
ZFP90	-1.08	2.83E-01
CARD14	-20.39	1.73E-76
SGSH	-18.65	8.95E-57

Supplementary Table 29. Welch's t-test comparison of gene expression in breast tissues from GTEx and breast cancer tissues from TCGA.
All statistical tests are two-sided.

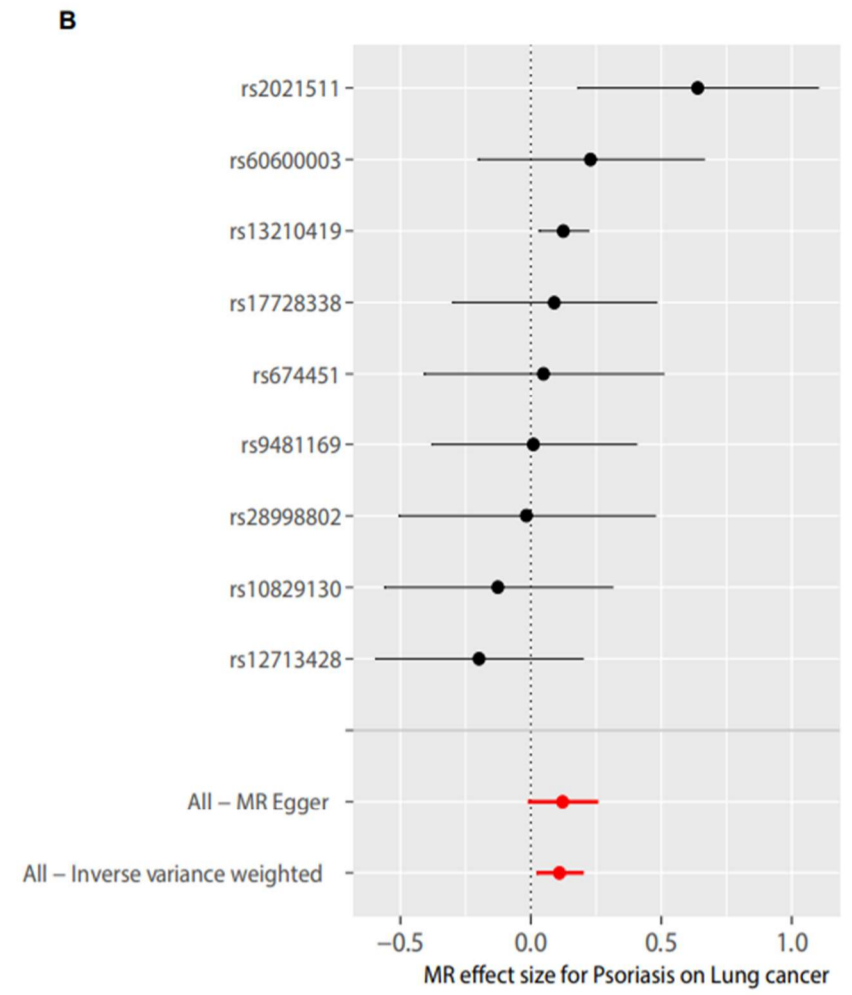
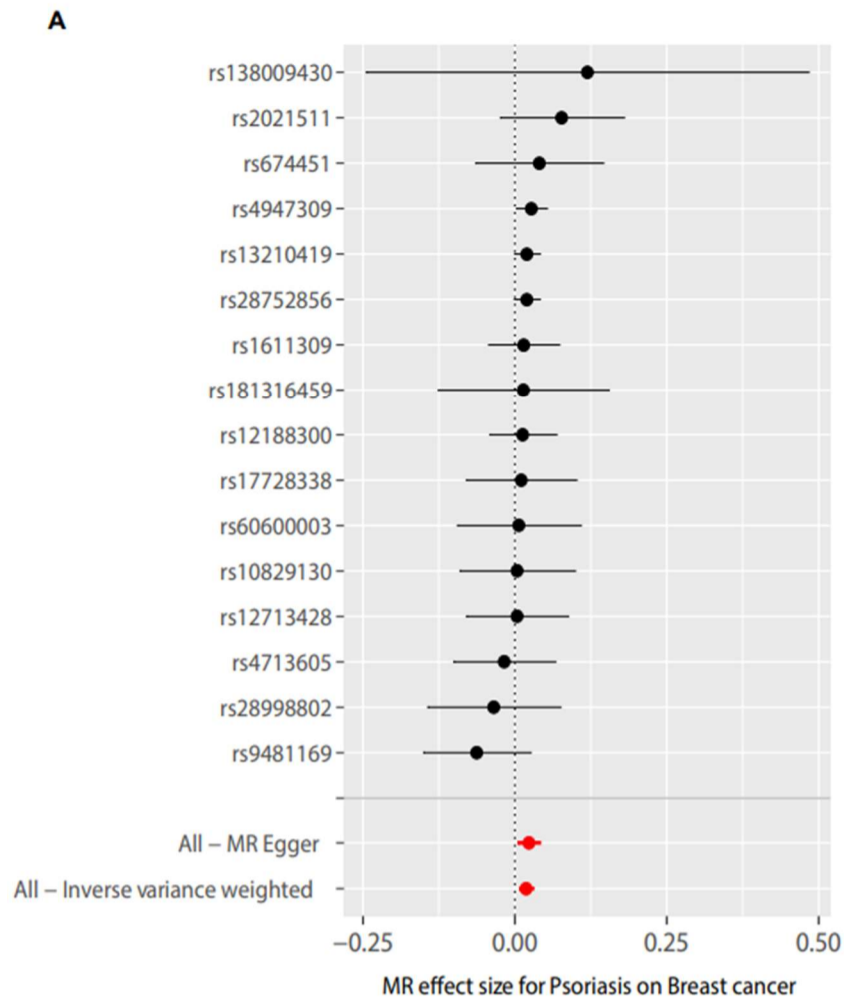
Gene Symbol	Welch's t-test	<i>p</i> value
ERAP1	-8.140	4.67E-15
MICB	-13.50	3.14E-34
C6orf3	-34.67	6.23E-106
CCHCR1	-0.02	9.85E-01
PSORS1C2	-3.09	2.15E-03
HCP5B	-15.67	8.19E-38
ZFP57	-1.93	5.44E-02
ALDH8A1	-16.12	3.47E-43
HBS1L	-36.95	2.49E-178
STK19B	-6.12	3.21E-9
HLA-V	-2.16	3.20E-02
HLA-DQB2	-15.09	1.34E-36
CCDC122	-3.88	1.32E-04
SGSH	-19.40	1.80E-53



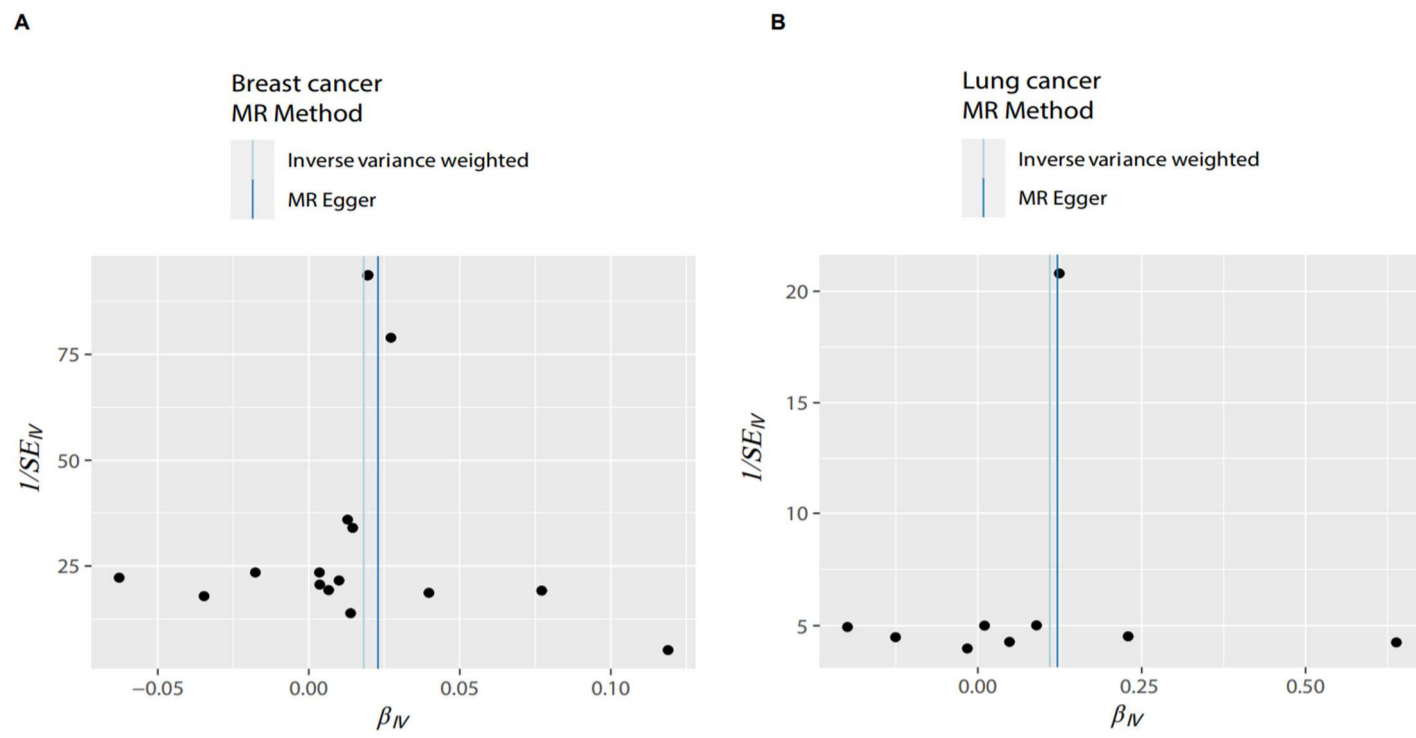
Supplementary Figure 1. Mendelian randomization leave-one-out sensitivity analysis for psoriasis on site-specific cancers. Mendelian randomization leave-one-out sensitivity analysis for psoriasis on (A) Breast cancer and (B) Lung cancer. Error bars represent 95% confidence intervals. Abbreviation: MR, Mendelian randomization



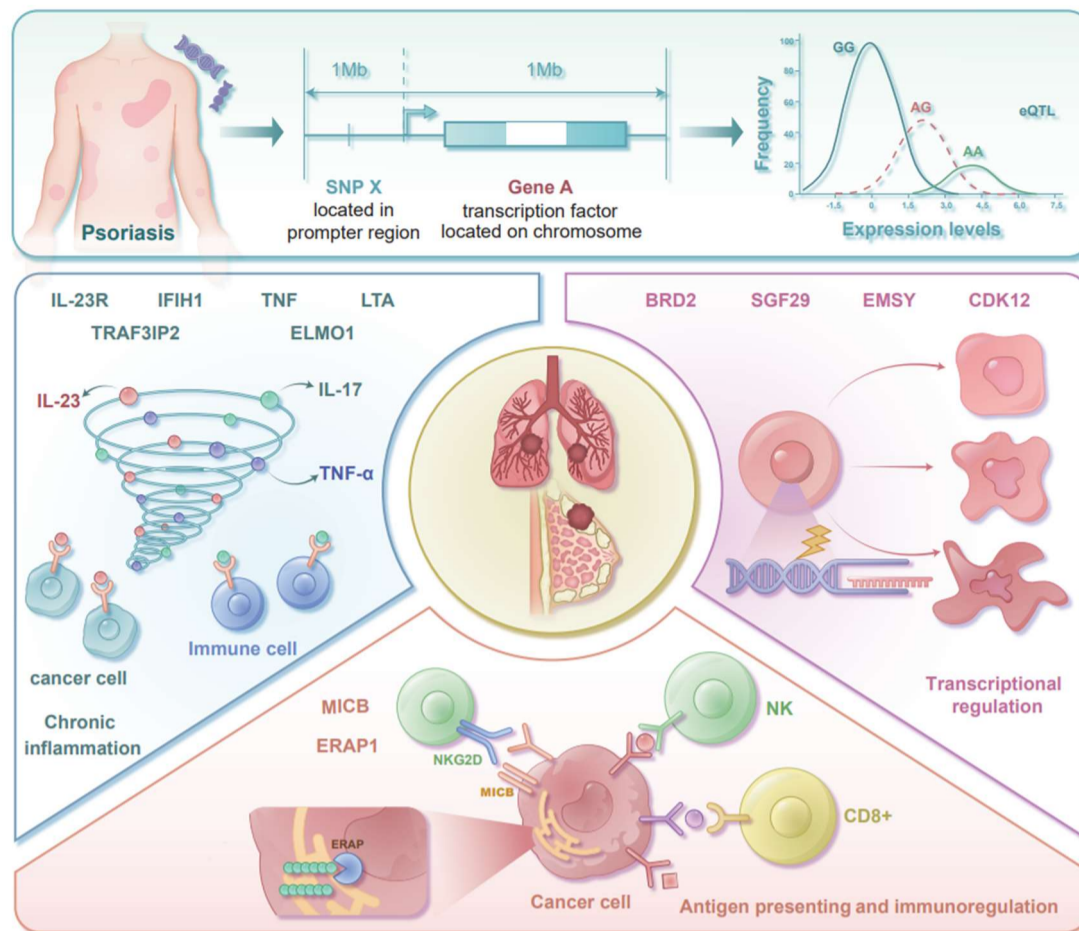
Supplementary Figure 2. Scatter plot of individual SNP-psoriasis and SNP-cancer associations with overlay of causal estimate from MR test. The vertical axis depicts the effect of SNPs on various malignancies, whereas the horizontal axis represents the effect of SNPs on psoriasis. Each dot represents one SNP. A non-zero gradient in the lines, with the displayed p value in the top box for the various Mendelian randomization models employed (represented by different colors), serves as evidence regarding the causality between psoriasis and cancers. Error bars represent 95% confidence intervals. Data are presented for breast cancer (A) and lung cancer (B).



Supplementary Figure 3. Forest plot to visualize causal effect of psoriasis on the risk of site-specific cancer. Forest plot to visualize causal effect of psoriasis on (A) Breast cancer and (B) Lung cancer. Error bars represent 95% confidence intervals. Abbreviation: MR, Mendelian randomization.



Supplementary Figure 4. Funnel plots to visualize causal effect of psoriasis on the risk of site-specific cancers. Funnel plots to visualize causal effect of psoriasis on (A) Breast cancer and (B) Lung cancer. Each dot represents one SNP with the MR estimate (Beta coefficient) on the horizontal axis and the precision of the estimate (inverse of the standard error) on the vertical axis. The vertical line indicates the overall MR estimate by different methods. Abbreviation: MR, Mendelian randomization.



Supplementary Figure 5. Possible mechanisms of cancer development in psoriasis patients

Psoriasis susceptibility loci harbored genes may promote lung and breast cancers through three potential mechanisms. (1) Altered expression of genes related to transcriptional regulation and cell cycle regulation (e.g., BRD2, SGF29, EMSY, and CDK12) may lead to uncontrolled cell transformation into tumor cells. (2) Chronic inflammation caused by upregulated cytokines, activated NF- κ B pathway, and the IL-23/Th17 axis related to genes such as IL-23R, IFIH1, TNF, LTA, TRAF3IP2, and ELMO1 may contribute to tumor development and progression. (3) Genes related to MHC I molecules (e.g., MICB and ERAP1) play a role in antigen processing and presentation. Changes in ERAP1 may lead to altered peptide antigen modification in the endoplasmic reticulum, while MICB, as a ligand for NKG2D, promotes NK cell cytotoxicity upon binding to the NKG2D receptor on the surface of NK cells. Alterations in these genes may result in changes in antigen presentation and immune regulation disorders, potentially promoting tumor immune escape.