



Shenzhen Bay
Laboratory

TCGD: the Cancer GWAS database

A step-by-step guide

Content

- **Part 0: Home page**
- **Part 1: Browse GWAS summary statistics**
- **Part 2: xQTLs – GWAS colocalization**
- **Part 3: TWAS results for GWASs**
- **Part 4: Data download**

Part 0: Home page



Use the navigation bar to click and jump to other pages

Welcome to the Cancer GWAS database (TCGD)

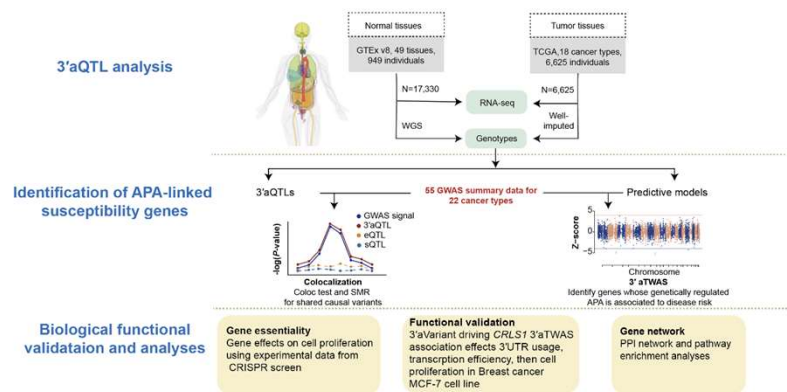
Use search bar to access to results of interested genes and tissues

GWAS Coloc TWAS

TCGD is a database of publicly available Cancer GWAS summary statistics. Each GWAS can be browsed with the manhattan plot, risk loci, SNP heritability and genetic correlations with other GWAS in the database.

Cancer GWAS were performed in this project based on (1) integrated the GWAS summary statistics reported in the published (including NHGRI EBI GWAS Catalog, GWAS ATLAS, Japanese ENcyclopedia of Genetic associations by Riken /JENGER, and PUBMED); (2) publicly available GWAS summary statistics of the UK Biobank Imputed Dataset (v3); and (3) combining genome information with digital health care data from national health registries of the FinnGen data (see Web Resources).

Brief introduction of TCGD



Currently the database contains 55 Cancer GWAS from 55 unique studies across 22 cancer types.

Schema of TCGD

Browse GWAS Overview of each GWAS such as Manhattan plots and QQ plot at SNP and gene levels and genetic correlations with other GWAS in the database. Browse GWAS	Colocalization Overview of each significant genetic risk loci from different cancer GWAS. Colocalization	Browse TWAS Overview of each significant genetic risk loci from different cancer GWAS. Browse TWAS
---	---	---

Part 1: Browse GWAS summary statistics

GWAS Browse summary statistics

1) Retrieve GWAS by CGID, trait, PMID, population and source

2) Click to select cancer/neoplasm type

Show entries Search:

CGID	Cancer/Neoplasm type -- Please select cancer type of interest --	Trait	PMID	Population	Source	Sample_size(~n)
CGS45	Thyroid	Malignant neoplasm of thyroid gland (all cancers excluded)	-	EUR	FinnGen	174995
CGS40	Skin	Carcinoma in situ of skin (all cancers excluded)	-	EUR	FinnGen	181624
CGS38	Skin	Cancer code, self-reported: skin cancer	-	EUR	UK Biobank-nealelab	361141
CGS41	Skin	Carcinoma in situ of skin of other and unspecified parts of face (all cancers excluded)	-	EUR	FinnGen	181238
CGS39	Skin	Malignant neoplasm of skin (all cancers excluded)	-	EUR	FinnGen	184390
CGS36	Prostate	Prostate cancer	28553958	EAS	JENGER	109347
CGS35	Prostate	Prostate cancer	29892016	EUR	GWAS Catalog	140254
CGS37	Prostate	Malignant neoplasm of prostate (all cancers excluded)	-	EUR	FinnGen	80996
CGS49	Prostate	Prostate cancer	32887889	EUR	GWAS Catalog	421142
CGS34	Pancreatic	Pancreatic cancer	28553958	EAS	JENGER	196187

Showing 1 to 10 of 56 entries Previous 2 3 4 5 6 Next

Part 1: Browse GWAS summary statistics

a

GWAS browse summary statistics

Show 10 entries

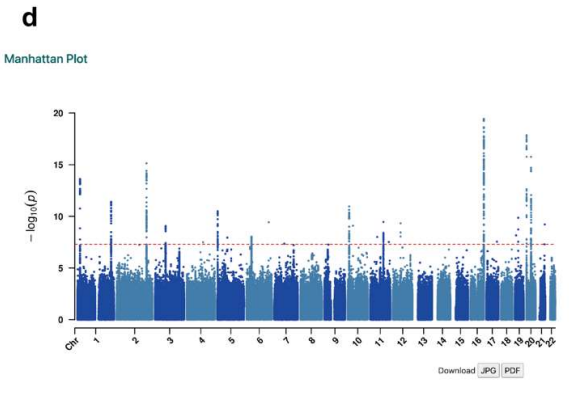
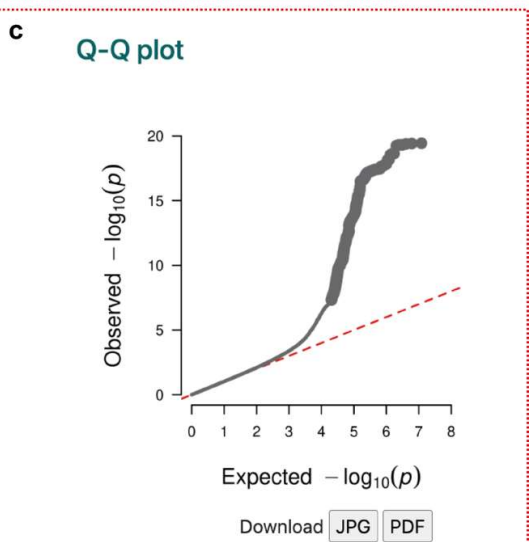
CGID	Cancer/Neoplasm type	Trait
CGS01	Basal cell carcinoma	Cancer code, self-reported: basal cell carcinoma
CGS02	Breast	Breast cancer
CGS03	Breast	Breast cancer
CGS04	Breast	Breast cancer
CGS05	Breast	Malignant neoplasm of breast (all cancers excluded)
CGS06	Cervical	Malignant neoplasm of cervix uteri (all cancers excluded)
CGS07	Colorectal	Colorectal cancer
CGS08	Breast	Malignant neoplasm of breast, HER2-negative (all cancers excluded)
CGS09	Colorectal	Colorectal cancer (all cancers excluded)
CGS10	Female genital organs	Endometrial cancer

Showing 1 to 10 of 55 entries

b

Trait information

GWAS ID: CGS01
Trait label: Cancer code, self-reported: basal cell carcinoma
System: -
SEX:
GWAS source: UK Biobank-nealelab [\[link\]](#)
GWAS PMID: - [\[link\]](#)



e

Total 235 records / 10 page First < [1] 2 3 4 5 > Last

rsID	Chr	Position	P-value	PAINTOR	CAVIARBF	FINEMAP	Population
rs140538743	Chr6	32617543	1.02e-08	0.031	0.032	0.032	EUR
rs22852237	Chr6	32614419	1.04e-08	0.030	0.032	0.032	EUR
rs22963966	Chr11	88843335	1.05e-08	0.016	0.016	0.016	EUR
rs9836630	Chr3	71527785	1.05e-09	0.087	0.088	0.088	EUR
rs34264449	Chr3	71527191	1.05e-09	0.087	0.088	0.088	EUR
rs1830298	Chr2	202181247	1.06e-14	0.035	0.034	0.034	EUR
rs9677180	Chr2	202184321	1.06e-14	0.035	0.034	0.034	EUR
rs10305480	Chr10	8931607	1.08e-11	0.137	0.144	0.144	EUR
rs4121433	Chr11	89024455	1.09e-08	0.016	0.015	0.015	EUR
rs26161549	Chr10	8940954	1.12e-10	0.015	0.015	0.015	EUR
rs24319752	Chr10	8964450	1.12e-10	0.015	0.015	0.015	EUR
rs1954772	Chr11	89033269	1.13e-08	0.015	0.014	0.015	EUR
rs9878602	Chr3	71535338	1.13e-09	0.081	0.082	0.082	EUR
rs17433004	Chr10	8949980	1.13e-10	0.015	0.014	0.014	EUR
rs17505682	Chr10	8982281	1.14e-10	0.015	0.014	0.014	EUR

Part 2: xQTLs – GWAS colocalization



Colocalization

GWAS-xQTL colocalization by using coloc method

1) Retrieve colocalization by gene name, tissue, CGID, Class, population and xQTL

Show 10 entries

2) Sort table by Hypp0-4 value

3) Click to select tissue

Search:

Gene Name	Class	CGID	Hypp0	Hypp1	Hypp2	Hypp3	Hypp4	Tissue / Cancer	Population	xQTL
CDK10	Basal cell carcinoma	CGS01	4.19e-03	6.51e-02	1.20e-04	9.30e-04	9.30e-01	Adipose_Subcutaneous	EUR	eQTL
MMP24	Basal cell carcinoma	CGS01	4.14e-02	1.76e-03	1.31e-01	4.75e-03	8.21e-01	Adipose_Subcutaneous	EUR	eQTL
MYO1F	Basal cell carcinoma	CGS01	1.30e-09	1.46e-01	6.73e-11	6.71e-03	8.48e-01	Adipose_Subcutaneous	EUR	eQTL
CDK10	Basal cell carcinoma	CGS01	3.57e-04	3.35e-04	1.06e-03	0.00e+00	9.98e-01	Adipose_Subcutaneous	EUR	sQTL
BZW1	Basal cell carcinoma	CGS01	2.23e-10	2.98e-11	9.46e-02	1.18e-02	8.94e-01	Adipose_Visceral_Omentum	EUR	eQTL
SLC12A7	Basal cell carcinoma	CGS01	6.49e-04	1.28e-05	2.36e-01	3.92e-03	7.59e-01	Adrenal_Gland	EUR	3'aQTL
AFG3L1P	Basal cell carcinoma	CGS01	2.82e-11	3.59e-11	7.62e-02	9.63e-02	8.27e-01	Adrenal_Gland	EUR	eQTL
CDK10	Basal cell carcinoma	CGS01	2.12e-01	1.30e-02	1.25e-02	0.00e+00	7.63e-01	Adrenal_Gland	EUR	sQTL
DBNDD1	Basal cell carcinoma	CGS01	5.39e-17	3.80e-15	1.76e-03	1.23e-01	8.75e-01	Artery_Aorta	EUR	eQTL
RCC2	Basal cell carcinoma	CGS01	9.36e-10	2.44e-10	7.41e-02	1.84e-02	9.07e-01	Artery_Aorta	EUR	eQTL

Showing 1 to 10 of 5,768 entries

[Download](#)

4) Download the entire results or for the specific gene

Previous 1 2 3 4 5 ... 577 Next

Part 3: TWAS results for GWASs



Browse TWAS

Users can search the TWAS results through anything you are interested in, such as gene.

1) Retrieve TWAS results by gene, tissue, CGID, Class, population and xQTL

2) Sort table by p-value and z-mean

Show entries

Search:

Gene Name	Class	Gene (?)	Z-score	P-value	Tissue / Cancer	CGID	Population	Type
RP11-834C11.8	Bone	intron_12_54152742_54152964	5.63	1.83e-08	Adipose_Subcutaneous	CGS55	EUR	splicing TWAS
RP11-4G2.1	Bone	ENSG00000259348.1	-4.86	1.15e-06	Nerve_Tibial	CGS55	EUR	Expression TWAS
POLR3G	Bone	ENSG00000113356.11	-5.10	3.35e-07	Cells_Cultured_fibroblasts	CGS55	EUR	Expression TWAS
RP11-834C11.11	Bone	ENSG00000260470.1	-5.45	4.97e-08	Colon_Sigmoid	CGS55	EUR	Expression TWAS
RP11-4G2.1	Bone	ENSG00000259348.1	-4.79	1.69e-06	Cells_Cultured_fibroblasts	CGS55	EUR	Expression TWAS
RP11-834C11.4	Bone	ENSG00000250742.2	-5.28	1.26e-07	Skin_Not_Sun_Exposed_Suprapubic	CGS55	EUR	Expression TWAS
CLIC6	Bone	NM_053277.3	4.12	3.86e-05	Skin_Not_Sun_Exposed_Suprapubic	CGS55	EUR	3'aTWAS
RP11-834C11.11	Bone	ENSG00000260470.1	5.45	4.97e-08	Artery_Tibial	CGS55	EUR	Expression TWAS
SBNO1-AS1	Bone	NR_157806.1	6.18	6.26e-10	Adipose_Visceral_Omentum	CGS55	EUR	3'aTWAS
ARL17B	Bone	NM_001039083.4	-20.66	8.71e-95	Uterus	CGS55	EUR	3'aTWAS

Gene Name	Class	Gene	Z-score	P-value	Tissue / Cancer	CGID	Population	Type
-----------	-------	------	---------	---------	-----------------	------	------------	------

Showing 1 to 10 of 52,821 entries

[Download](#)

Previous 2 3 4 5 ... 5283 Next

Part 4: Data download

1. Download page provides the 3'aTWAS models of GTEx v8 cohort and TCGA cohort

Tissue type	Study	Sample Size	File Name
Adipose - Subcutaneous	GTEx	493	Adipose_Subcutaneous.tar.gz
Adipose - Visceral (Omentum)	GTEx	403	Adipose_Visceral_Omentum.tar.gz
Adrenal Gland	GTEx	201	Adrenal_Gland.tar.gz
Artery - Aorta	GTEx	339	Artery_Aorta.tar.gz
Artery - Coronary	GTEx	181	Artery_Coronary.tar.gz
Artery - Tibial	GTEx	490	Artery_Tibial.tar.gz
Brain - Amygdala	GTEx	120	Brain_Amygdala.tar.gz
Brain - Anterior cingulate cortex (BA24)	GTEx	137	Brain_Anterior_cingulate_cortex_BA24.tar.gz
Brain - Caudate (basal ganglia)	GTEx	174	Brain_Caudate_basal_ganglia.tar.gz
Brain - Cerebellum	GTEx	159	Brain_Cerebellum.tar.gz
Brain - Cerebellar Hemisphere	GTEx	190	Brain_Cerebellar_Hemisphere.tar.gz
Brain - Cortex	GTEx	185	Brain_Cortex.tar.gz

Access 3'aTWAS data and colocalization results for both GTEx and TCGA datasets, as well as formatted GWAS summary data, through the Download module.

2. Download page provides the colocalization results of GTEx v8 cohort and TCGA cohort


Cancer type	Study	Sample Size	File Name
Adipose - Subcutaneous	GTEx	493	Adipose_Subcutaneous_coloc.txt
Adipose - Visceral (Omentum)	GTEx	403	Adipose_Visceral_Omentum_coloc.txt
Adrenal Gland	GTEx	201	Adrenal_Gland_coloc.txt
Artery - Aorta	GTEx	339	Artery_Aorta_coloc.txt
Artery - Coronary	GTEx	181	Artery_Coronary_coloc.txt
Artery - Tibial	GTEx	490	Artery_Tibial_coloc.txt
Brain - Amygdala	GTEx	120	Brain_Amygdala_coloc.txt
Brain - Anterior cingulate cortex (BA24)	GTEx	137	Brain_Anterior_cingulate_cortex_BA24_coloc.txt
Brain - Caudate (basal ganglia)	GTEx	174	Brain_Caudate_basal_ganglia_coloc.txt
Brain - Cerebellum	GTEx	159	Brain_Cerebellum_coloc.txt
Brain - Cerebellar Hemisphere	GTEx	190	Brain_Cerebellar_Hemisphere_coloc.txt

3. Download 55 GWAS summary file across 22 cancer types

CGID	Cancer/Neoplasm type	Source	Sample Size	File Name
CGS01	Basal cell carcinoma	EUR	361141	CGS01.gwas_summary.txt
CGS02	Breast	EUR	69626	CGS02.gwas_summary.txt
CGS03	Breast	EUR	139274	CGS03.gwas_summary.txt
CGS04	Breast	EAS	95283	CGS04.gwas_summary.txt
CGS05	Breast	EUR	107722	CGS05.gwas_summary.txt
CGS06	Cervical	EUR	100969	CGS06.gwas_summary.txt
CGS07	Colorectal	EAS	202807	CGS07.gwas_summary.txt
CGS08	Breast	EUR	106676	CGS08.gwas_summary.txt
CGS09	Colorectal	EUR	177028	CGS09.gwas_summary.txt
CGS10	Female genital organs	EUR	121885	CGS10.gwas_summary.txt
CGS11	Eye	EUR	361141	CGS11.gwas_summary.txt
CGS12	Female genital organs	EUR	102986	CGS12.gwas_summary.txt

Part 4: Data download

a



Home Browse GWAS Colocalization Browse TWAS Upload Download Help

Colocalization
GWAS-xQTL colocalization by using coloc method

Show 10 entries Search:

Gene Name	Class	CGID	Hypp0	Hypp1	Hypp2	Hypp3	Hypp4	Tissue / Cancer	Population	xQTL
DIRC3	Thyroid	CGS45	4.47e-06	1.78e-06	1.15e-01	4.51e-02	8.40e-01	Adrenal_Gland	EUR	sQTL
TRMO	Thyroid	CGS45	1.63e-05	3.93e-03	1.75e-04	4.13e-02	9.55e-01	Artery_Coronary	EUR	eQTL
FOXE1	Thyroid	CGS45	3.41e-11	5.54e-11	6.14e-02	9.90e-02	8.40e-01	Brain_Cerebellum	EUR	eQTL
TMOD1	Thyroid	CGS45	3.77e-17	1.73e-17	1.34e-01	6.08e-02	8.05e-01	Brain_Nucleus_accumbens_basal_ganglia	EUR	sQTL
NANS	Thyroid	CGS45	2.60e-03	9.03e-04	2.14e-02	6.46e-03	9.69e-01	Brain_Putamen_basal_ganglia	EUR	eQTL
CCDC180	Thyroid	CGS45	9.31e-02	8.04e-04	9.40e-02	0.00e+00	8.12e-01	Brain_Putamen_basal_ganglia	EUR	sQTL
TRIM14	Thyroid	CGS45	1.84e-02	2.38e-03	4.47e-02	4.85e-03	9.30e-01	Breast_Mammary_Tissue	EUR	eQTL
TRMO	Thyroid	CGS45	8.55e-06	1.02e-02	7.97e-05	9.45e-02	8.95e-01	Cells_Cultured_fibroblasts	EUR	eQTL
NCBP1	Thyroid	CGS45	3.43e-17	9.89e-18	1.28e-01	3.61e-02	8.36e-01	Muscle_Skeletal	EUR	eQTL
SMAD3	Thyroid	CGS45	1.62e-03	3.22e-04	1.97e-01	3.85e-02	7.62e-01	Nerve_Tibial	EUR	eQTL


Showing 1 to 10 of 578 entries

Download

Previous 1 2 3 4 5 ... 577 Next

The 'Download' button allows users to download either the complete set of results or the currently retrieved results on the page (specific to selected genes, tissues, or cancers).

b



Home Browse GWAS Colocalization Browse TWAS Upload Download Help

Browse TWAS
Users can search the TWAS results through anything you are interested in, such as gene.

Show 10 entries Search:

Gene Name	Class	Gene (?)	Z-score	P-value	Tissue / Cancer	CGID	Population	Type
SPATA33	Basal cell carcinoma	NR_073515.2	7.11	1.14e-12	Skin_Not_Sun_Exposed_Suprapubic	CGS01	EUR	3'atWAS
ARL17B	Basal cell carcinoma	NM_001039083.4	-6.05	1.48e-09	Uterus	CGS01	EUR	3'atWAS
MXRA7	Basal cell carcinoma	NM_001008529.3	4.80	1.55e-06	Skin_Sun_Exposed_Lower_leg	CGS01	EUR	3'atWAS
CFLAR	Basal cell carcinoma	NR_147248.2	4.79	1.65e-06	Stomach	CGS01	EUR	3'atWAS
MXRA7	Basal cell carcinoma	XM_005257383.2	4.78	1.73e-06	Skin_Sun_Exposed_Lower_leg	CGS01	EUR	3'atWAS
MXRA7	Basal cell carcinoma	XM_005257383.2	4.68	2.89e-06	Adipose_Subcutaneous	CGS01	EUR	3'atWAS
MXRA7	Basal cell carcinoma	XM_005257383.2	4.58	4.54e-06	Skin_Not_Sun_Exposed_Suprapubic	CGS01	EUR	3'atWAS
LILRB5	Basal cell carcinoma	NM_001304457.2	4.58	4.55e-06	Whole_Blood	CGS01	EUR	3'atWAS
LILRB5	Basal cell carcinoma	XM_011526382.2	4.58	4.55e-06	Whole_Blood	CGS01	EUR	3'atWAS
LINC-PINT	Basal cell carcinoma	NR_110472.1	-4.50	6.80e-06	Thyroid	CGS01	EUR	3'atWAS

Showing 1 to 10 of 528 entries

Download

Previous 1 2 3 4 5 ... 528 Next

Contact us

- Our website can also serve as a data sharing platform for cancer GWASs. If your research produces new cancer GWAS data and you want to share your cancer GWAS data to other researchers or need host your sc-eQTLs data on internet, please feel free to contact us. Our email address is Lei.li@szbl.ac.cn
- Moreover, if you encounter any problem or have any advice when using TCGD, please feel free to contact us. We will respond in a timely manner, thanks for your contribution for improvement of TCGD.