中药-有效成分-乳腺癌相关靶点的网药分析

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LiChuang Huang

@ 立效研究院

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1 摘要

1.1 需求

网络药理学分析

- 药对：白花蛇舌草，半枝莲，浙贝母
- 疾病：乳腺癌
- 目标：提供中药-有效成分-乳腺癌相关靶点的网药分析

1.2 结果

- 数据来源于 TCMSP，以 OB、DL 筛选过化合物 Tab. 2。
- 疾病靶点来源于 GeneCards, Tab. 4
- 疾病成分靶点网络图：Fig. 3
- 包含通路：Fig. 6, Tab. 5

1.3 需求 2

下一步请对 beta-sitosterol 的 60 个靶点做富集分析，并作这些靶点与糖酵解、巨噬细胞极化相关性分析。意向靶点为 JTK2（即 FGFR4），请重点关注另外需要提供一个韦恩图表明 beta-sitosterol 就是三种药共有的唯一成分

- 巨噬细胞极化 (糖酵解), 巨噬细胞极化，上移，
- 基因名称
- 关联分析热图，调整

1.4 结果 2

见 6.2

2 前言

3 材料和方法

3.1 材料

3.2 方法

Mainly used method:

- R package `ClusterProfiler` used for gene enrichment analysis[1].
- The Human Gene Database `GeneCards` used for disease related genes prediction[2].
- R package `Limma` and `edgeR` used for differential expression analysis[3,4].
- Website `TCMSP` https://tcmsp-e.com/ used for data source[5].

- The API of `UniProtKB` (https://www.uniprot.org/help/api_queries) used for mapping of names or IDs of proteins.
- R version 4.4.0 (2024-04-24); Other R packages (eg., `dplyr` and `ggplot2`) used for statistic analysis or data visualization.

4 分析结果

5 结论

6 附：分析流程

6.1 网络药理学

6.1.1 成分

Table 1 (下方表格) 为表格 Herbs information 概览。

(对应文件为 `Figure+Table/Herbs-information.csv`)

> 注：表格共有 3 行 2 列，以下预览的表格可能省略部分数据；含有 3 个唯一 'Herb_pinyin_name'。

Table 1: Herbs information

Herb_pinyin_name	Herb_cn_name
Baihuasheshecao	白花蛇舌草
Banzhilian	半枝莲
Zhebeimu	浙贝母

Table 2 (下方表格) 为表格 Compounds filtered by OB and DL 概览。

(对应文件为 `Figure+Table/Compounds-filtered-by-OB-and-DL.xlsx`)

> 注：表格共有 43 行 15 列，以下预览的表格可能省略部分数据；含有 39 个唯一 'Mol ID；含有 3 个唯一 'Herb_pinyin_name'。

> **OB (%) and DL cut-off :**
>
> OB >= 30%; DL >= 0.18

Table 2: Compounds filtered by OB and DL

Mol ID	Molecu…	MW	AlogP	Hdon	Hacc	OB (%)	Caco-2	BBB	DL
MOL001646	2,3-di…	282.310	3.262	0	4	34.858…	0.75128	0.17357	0.26255
MOL001659	Porife…	412.770	7.640	1	1	43.829…	1.43659	1.03472	0.75596
MOL001663	(4aS,6…	456.780	6.422	2	3	32.028…	0.60932	0.39268	0.75713
MOL001670	2-meth…	252.280	3.278	0	3	37.827…	0.72896	-0.12795	0.20517
MOL000449	Stigma…	412.770	7.640	1	1	43.829…	1.44458	1.00045	0.75665
MOL000358	beta-s…	414.790	8.084	1	1	36.913…	1.32463	0.98588	0.75123
MOL000098	quercetin	302.250	1.504	5	7	46.433…	0.04842	-0.76890	0.27525
MOL001040	(2R)-5…	272.270	2.298	3	5	42.363…	0.37818	-0.47578	0.21141
MOL012245	5,7,4’…	302.300	2.281	3	6	36.626…	0.43274	-0.31890	0.26833
MOL012246	5,7,4’…	302.300	2.281	3	6	74.235…	0.37328	-0.43273	0.26479
MOL012248	5-hydr…	328.340	2.820	1	6	65.818…	0.84750	0.07437	0.32874
MOL012250	7-hydr…	298.310	2.836	1	5	43.716…	0.95759	0.22129	0.25376
MOL012251	Chrysi…	268.280	2.853	1	4	37.268…	0.90922	0.15556	0.20317
MOL012252	9,19-c…	426.800	7.554	1	1	38.685…	1.44891	1.16360	0.78074
MOL002776	Baicalin	446.390	0.639	6	11	40.123…	-0.84777	-1.74426	0.75264
…	…	…	…	…	…	…	…	…	…

Figure 1 (下方图) 为图 intersection of all compounds 概览。

(对应文件为 `Figure+Table/intersection-of-all-compounds.pdf`)

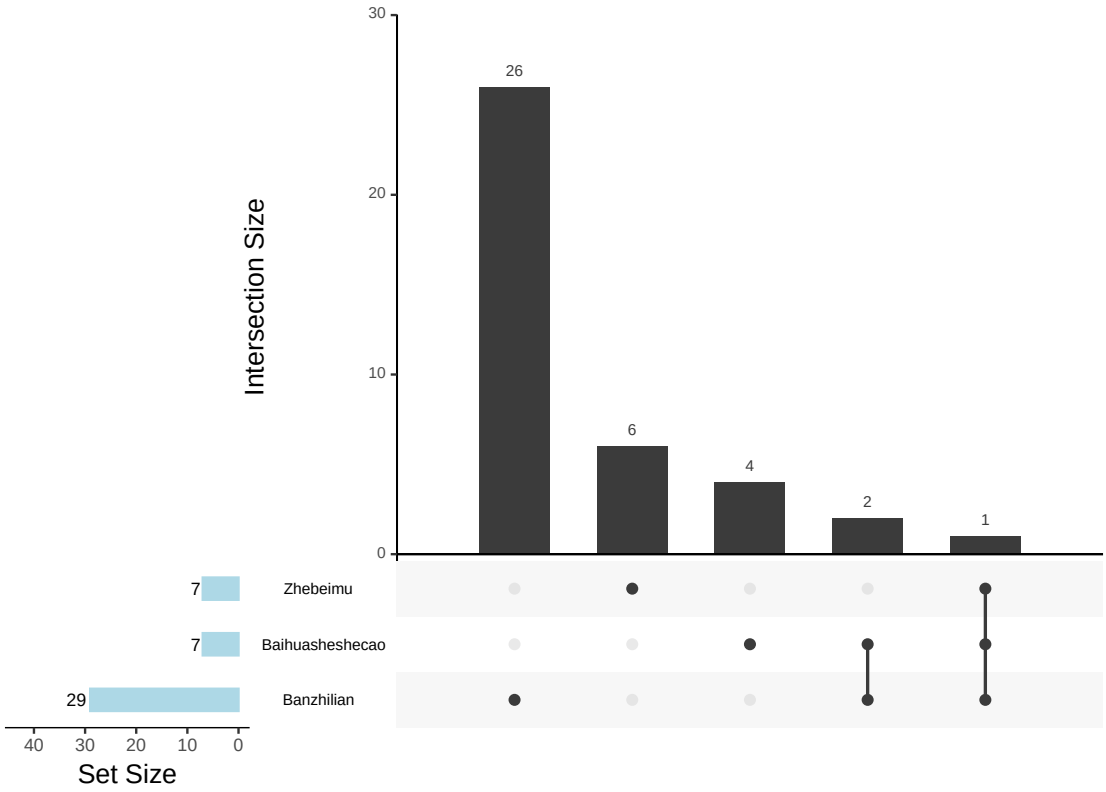

Figure 1: Intersection of all compounds

All_intersection :

MOL000358

(上述信息框内容已保存至 `Figure+Table/intersection-of-all-compounds-content`)

6.1.2 成分靶点

Table 3 (下方表格) 为表格 tables of Herbs compounds and targets 概览。

(对应文件为 `Figure+Table/tables-of-Herbs-compounds-and-targets.xlsx`)

注：表格共有 1846 行 4 列，以下预览的表格可能省略部分数据；含有 3 个唯一 'Herb_pinyin_name'。

Table 3: Tables of Herbs compounds and targets

Herb_pinyin_name	Molecule name	symbols	protein.names
Banzhilian	luteolin	NA	NA
Banzhilian	luteolin	MMP2	72 kDa type IV co...
Banzhilian	luteolin	CLG4A	72 kDa type IV co...

Herb_pinyin_name	Molecule name	symbols	protein.names
Banzhilian	luteolin	ADCY2	Adenylate cyclase...
Banzhilian	luteolin	KIAA1060	Adenylate cyclase...
Banzhilian	luteolin	APP	Amyloid-beta prec...
Banzhilian	luteolin	A4	Amyloid-beta prec...
Banzhilian	luteolin	AD1	Amyloid-beta prec...
Banzhilian	luteolin	AR	Androgen receptor...
Banzhilian	luteolin	DHTR	Androgen receptor...
Banzhilian	luteolin	NR3C4	Androgen receptor...
Banzhilian	luteolin	XIAP	E3 ubiquitin-prot...
Banzhilian	luteolin	API3	E3 ubiquitin-prot...
Banzhilian	luteolin	BIRC4	E3 ubiquitin-prot...
Banzhilian	luteolin	IAP3	E3 ubiquitin-prot...
...	...	...	...

6.1.3 疾病靶点

Table 4 (下方表格) 为表格 Disease related targets from GeneCards 概览。

(对应文件为 `Figure+Table/Disease-related-targets-from-GeneCards.xlsx`)

注: 表格共有 1746 行 7 列, 以下预览的表格可能省略部分数据; 含有 1746 个唯一 'Symbol'。

The GeneCards data was obtained by querying :

breast cancer

Restrict (with quotes) :

FALSE

Filtering by Score: :

Score > 15

Table 4: Disease related targets from GeneCards

Symbol	Description	Category	UniProt_ID	GIFtS	GC_id	Score
BRCA2	BRCA2 DNA ...	Protein Co...	P51587	56	GC13P032315	584.27
BRCA1	BRCA1 DNA ...	Protein Co...	P38398	59	GC17M043044	565.02
PALB2	Partner An...	Protein Co...	Q86YC2	53	GC16M023603	366.84
ATM	ATM Serine...	Protein Co...	Q13315	61	GC11P108223	340.7

Symbol	Description	Category	UniProt_ID	GIFtS	GC_id	Score
CHEK2	Checkpoint...	Protein Co...	O96017	63	GC22M028687	336.43
BRIP1	BRCA1 Inte...	Protein Co...	Q9BX63	57	GC17M061679	325.07
CDH1	Cadherin 1	Protein Co...	P12830	58	GC16P068737	306.68
BARD1	BRCA1 Asso...	Protein Co...	Q99728	55	GC02M214725	291.41
TP53	Tumor Prot...	Protein Co...	P04637	62	GC17M007661	287.34
MSH6	MutS Homol...	Protein Co...	P52701	58	GC02P047695	239.29
MSH2	MutS Homol...	Protein Co...	P43246	57	GC02P047403	231.87
MLH1	MutL Homol...	Protein Co...	P40692	58	GC03P036993	223.25
C11orf65	Chromosome...	Protein Co...	Q8NCR3	40	GC11M108308	218.43
LOC126862571	BRD4-Indep...	Functional...		10	GC17P114574	215.91
APC	APC Regula...	Protein Co...	P25054	58	GC05P112707	199.23
...	...	...	...	...	...	...

6.1.4 疾病-成分-靶点网络图

Figure 2 (下方图) 为图 Network pharmacology with disease 概览。

(对应文件为 `Figure+Table/Network-pharmacology-with-disease.pdf`)

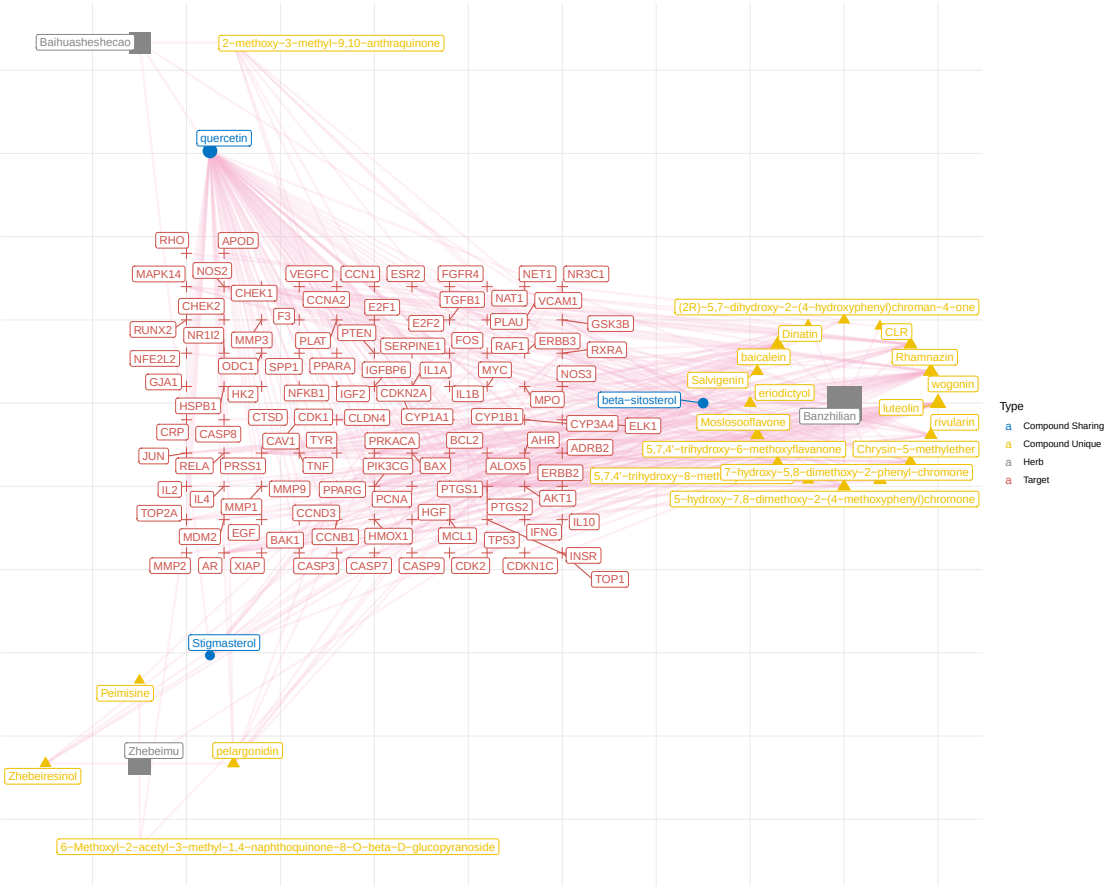

Figure 2: Network pharmacology with disease

Figure 3 (下方图) 为图 Targets intersect with targets of diseases 概览。

(对应文件为 `Figure+Table/Targets-intersect-with-targets-of-diseases.pdf`)

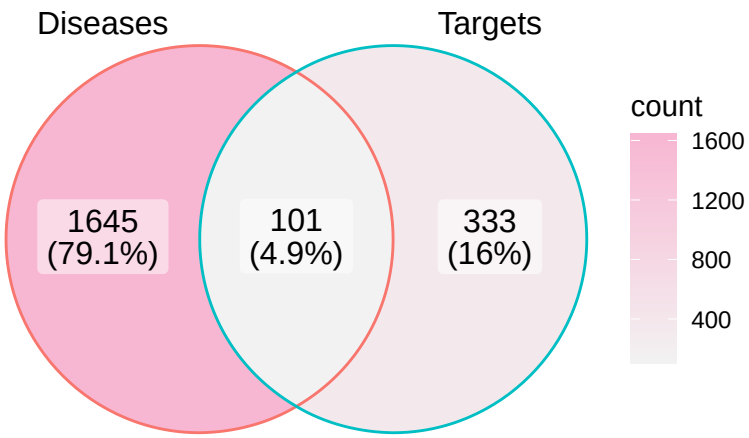

Figure 3: Targets intersect with targets of diseases

Intersection :

CHEK2, TP53, PTEN, ERBB2, CDKN2A, AKT1, AR, CASP8, ERBB3, JUN, MYC, IL2, MDM2, CDK2, IL1B, FGFR4, BCL2, BAX, TGFB1, ESR2, IGF2, NFE2L2, PPARG, EGF, PTGS2, TNF, MMP2, MMP9, RAF1, CASP3, CYP1A1, NFKB1, CTSD, PCNA, PLAU, TOP2A, CDK1, MMP1, E2F1, VEGFC, IFNG, CYP1B1, CHEK1, PIK3CG, IL10, CASP9, CAV1,...

(上述信息框内容已保存至 `Figure+Table/Targets-intersect-with-targets-of-diseases-content`)

6.1.5 富集分析

Figure 4 (下方图) 为图 KEGG enrichment 概览。

(对应文件为 `Figure+Table/KEGG-enrichment.pdf`)

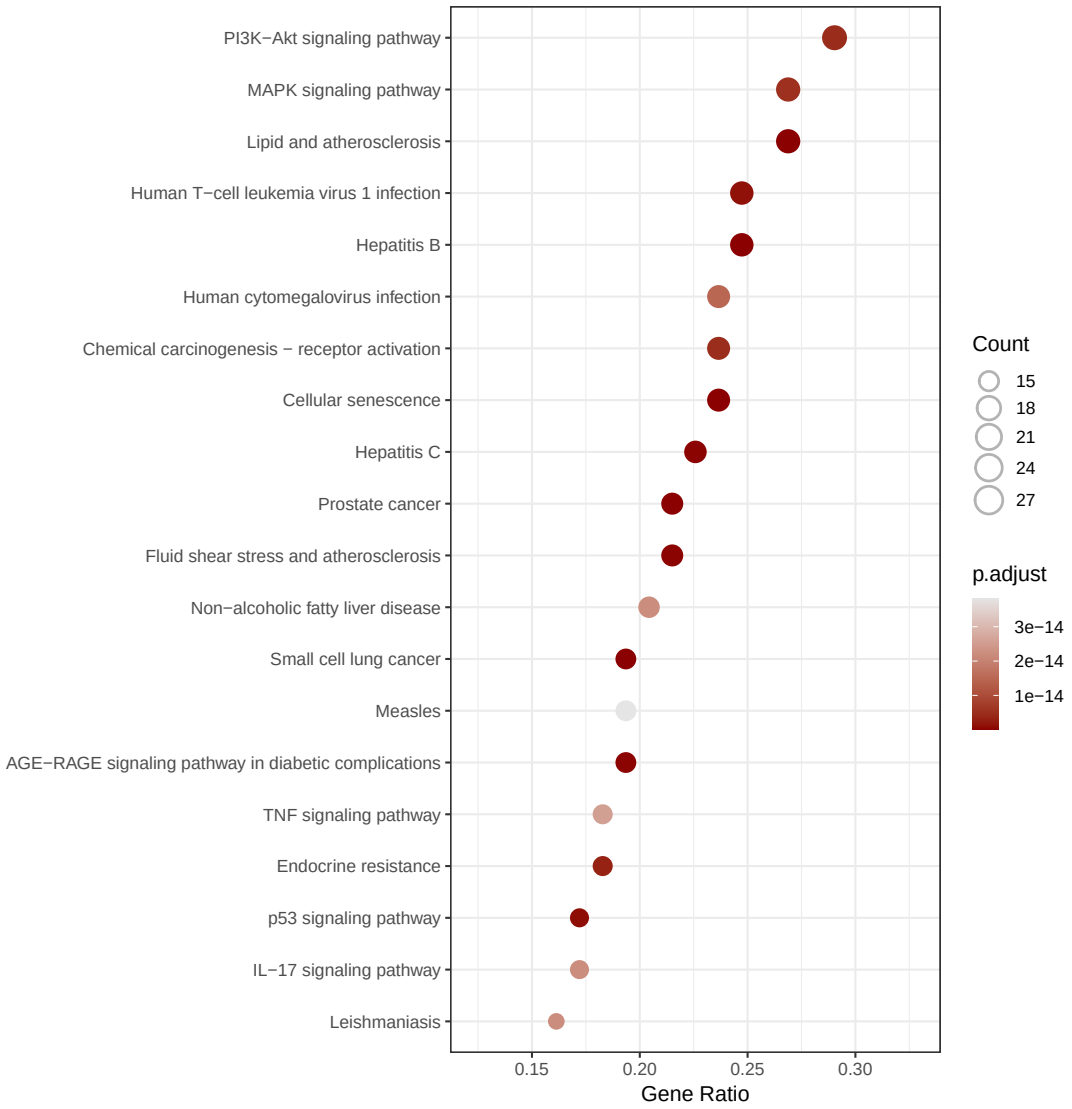

Figure 4: KEGG enrichment

Figure 5 (下方图) 为图 GO enrichment 概览。

(对应文件为 `Figure+Table/GO-enrichment.pdf`)

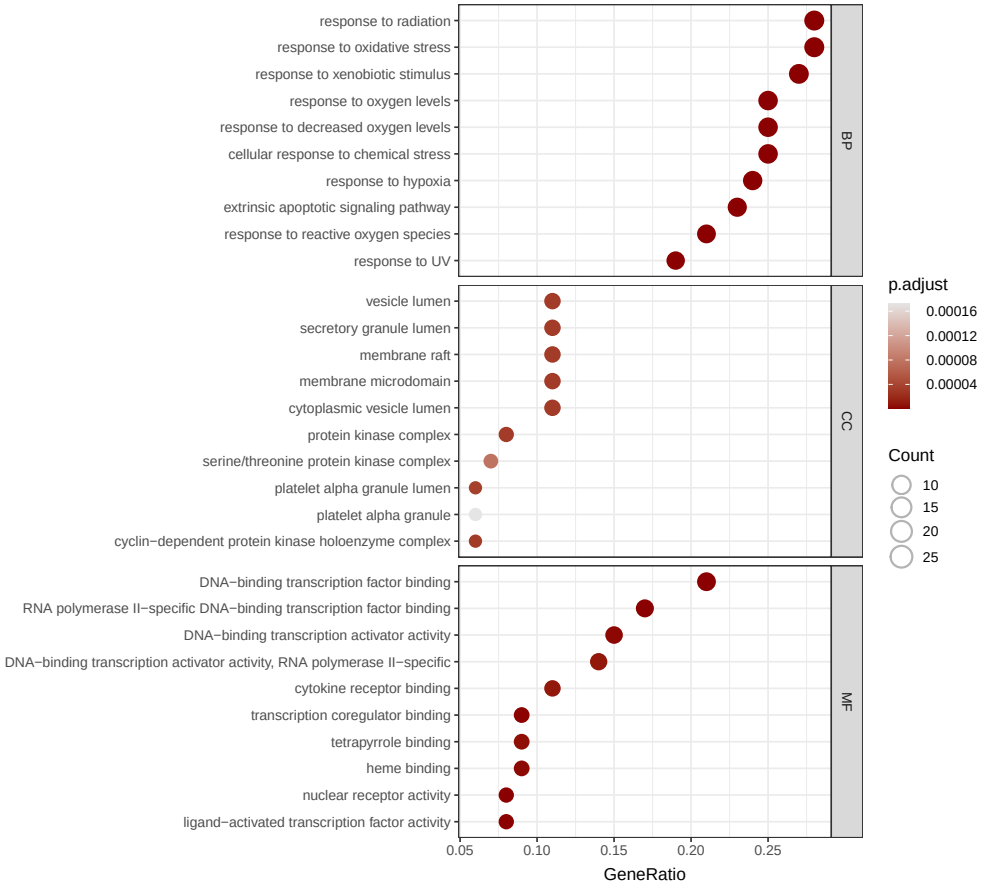

Figure 5: GO enrichment

6.1.6 疾病-成分-靶点-通路网络图

Figure 6 (下方图) 为图 Network pharmacology with disease and pathway 概览。

(对应文件为 `Figure+Table/Network-pharmacology-with-disease-and-pathway.pdf`)

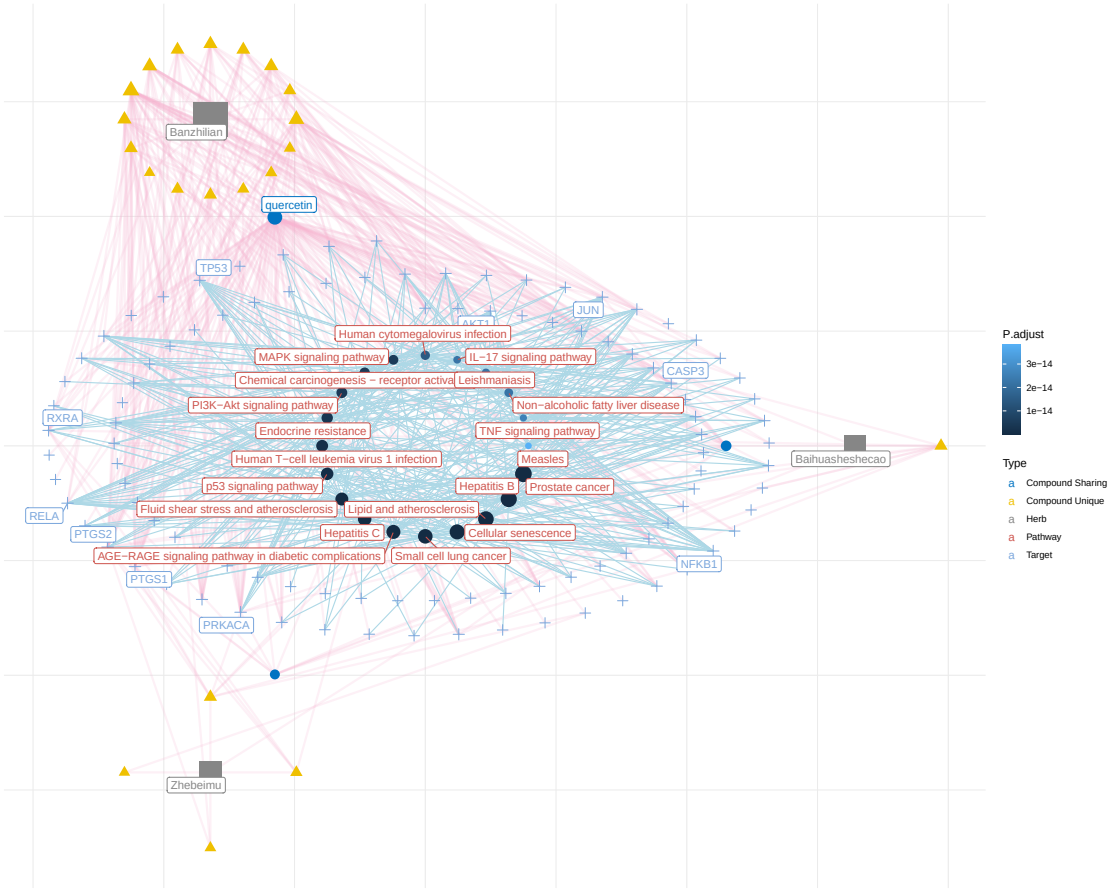

Figure 6: Network pharmacology with disease and pathway

Table 5 (下方表格) 为表格 Network pharmacology with disease and pathway data 概览。

(对应文件为 `Figure+Table/Network-pharmacology-with-disease-and-pathway-data.xlsx`)

> 注：表格共有 431 行 5 列，以下预览的表格可能省略部分数据；含有 3 个唯一 'Herb_pinyin_name；含有 24 个唯一 'Ingredient.name；含有 101 个唯一 'Target.name'。

Table 5: Network pharmacology with disease and pathway data

Herb_pinyin_name	Ingredient.name	Target.name	Hit_pathway_number	Enriched_pathways
Baihuasheshecao	quercetin	NFKB1	18	AGE-RAGE signalin…
Baihuasheshecao	quercetin	RELA	18	AGE-RAGE signalin…
Banzhilian	baicalein	RELA	18	AGE-RAGE signalin…
Banzhilian	luteolin	RELA	18	AGE-RAGE signalin…
Banzhilian	quercetin	NFKB1	18	AGE-RAGE signalin…
Banzhilian	quercetin	RELA	18	AGE-RAGE signalin…
Banzhilian	wogonin	RELA	18	AGE-RAGE signalin…
Baihuasheshecao	quercetin	AKT1	17	AGE-RAGE signalin…
Banzhilian	baicalein	AKT1	17	AGE-RAGE signalin…

Herb_pinyin_name	Ingredient.name	Target.name	Hit_pathway_number	Enriched_pathways
Banzhilian	luteolin	AKT1	17	AGE-RAGE signalin...
Banzhilian	quercetin	AKT1	17	AGE-RAGE signalin...
Banzhilian	wogonin	AKT1	17	AGE-RAGE signalin...
Baihuasheshecao	quercetin	TP53	14	Cellular senescen...
Banzhilian	baicalein	TP53	14	Cellular senescen...
Banzhilian	luteolin	TP53	14	Cellular senescen...
...	...	...	...	...

6.2 beta-sitosterol

6.2.1 富集分析

Figure 7 (下方图) 为图 SITO KEGG enrichment 概览。

(对应文件为 `Figure+Table/SITO-KEGG-enrichment.pdf`)

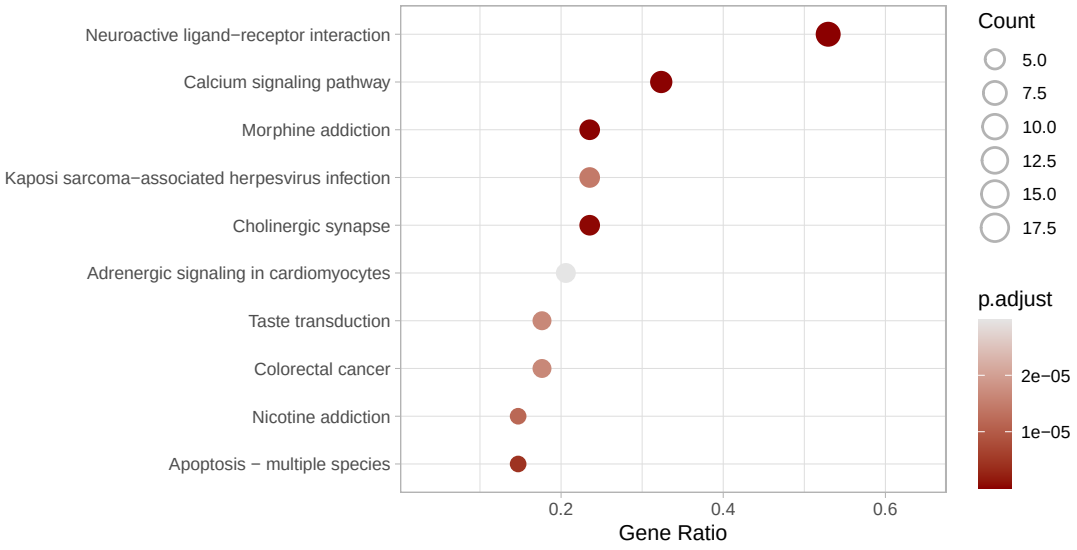

Figure 7: SITO KEGG enrichment

Figure 8 (下方图) 为图 SITO GO enrichment 概览。

(对应文件为 `Figure+Table/SITO-GO-enrichment.pdf`)

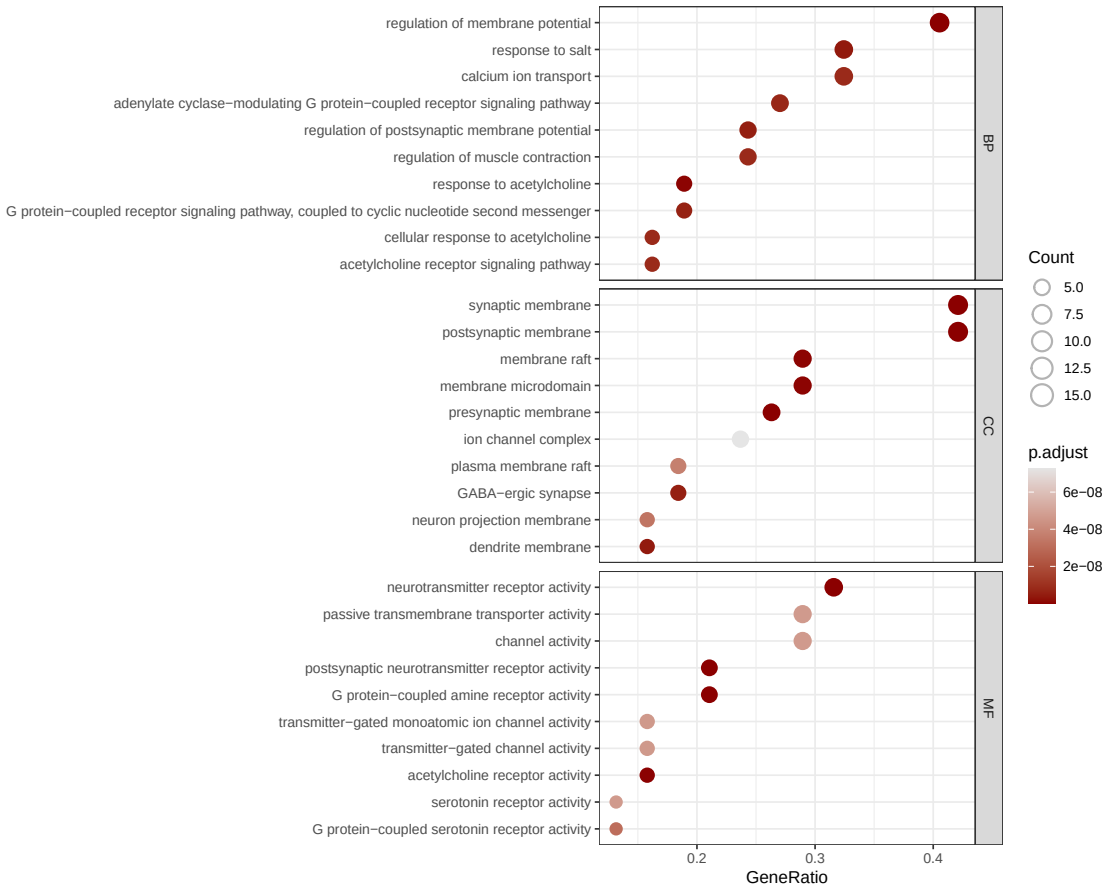

Figure 8: SITO GO enrichment

Table 6 (下方表格) 为表格 SITO KEGG enrichment data 概览。

(对应文件为 `Figure+Table/SITO-KEGG-enrichment-data.xlsx`)

> 注：表格共有 181 行 11 列，以下预览的表格可能省略部分数据；含有 181 个唯一 'ID'。

1. pvalue: 显著性 P。

Table 6: SITO KEGG enrichment data

ID	Descri…	GeneRatio	BgRatio	pvalue	p.adjust	qvalue	geneID	Count	geneID…
hsa04080	Neuroa…	18/34	366/8753	1.2099…	2.1900…	1.1590…	148/14…	18	148 | …
hsa05032	Morphi…	8/34	91/8753	1.4533…	9.0812…	4.8060…	1812/2…	8	1812 |…
hsa04020	Calciu…	11/34	253/8753	1.5051…	9.0812…	4.8060…	148/14…	11	148 | …
hsa04725	Cholin…	8/34	113/8753	8.2528…	3.7344…	1.9763…	596/11…	8	596 | …
hsa04215	Apopto…	5/34	32/8753	1.2159…	4.4015…	2.3294…	581/59…	5	581 | …
hsa05033	Nicoti…	5/34	40/8753	3.8860…	1.1722…	6.2040…	1139/2…	5	1139 |…
hsa05167	Kaposi…	8/34	194/8753	5.5839…	1.4438…	7.6411…	581/71…	8	581 | …
hsa04742	Taste …	6/34	86/8753	8.1367…	1.6363…	8.6601…	1131/2…	6	1131 |…

ID	Descri…	GeneRatio	BgRatio	pvalue	p.adjust	qvalue	geneID	Count	geneID…
hsa05210	Colore…	6/34	86/8753	8.1367…	1.6363…	8.6601…	581/59…	6	581 | …
hsa04261	Adrene…	7/34	154/8753	1.6438…	2.9753…	1.5746…	148/14…	7	148 | …
hsa05161	Hepati…	7/34	162/8753	2.3085…	3.7986…	2.0103…	581/59…	7	581 | …
hsa05145	Toxopl…	6/34	111/8753	3.6575…	5.5167…	2.9196…	596/83…	6	596 | …
hsa04726	Seroto…	6/34	115/8753	4.4952…	6.0205…	3.1862…	836/33…	6	836 | …
hsa05152	Tuberc…	7/34	180/8753	4.6567…	6.0205…	3.1862…	581/59…	7	581 | …
hsa01524	Platin…	5/34	73/8753	8.0960…	9.3555…	4.9511…	581/59…	5	581 | …
…	…	…	…	…	…	…	…	…	…

Table 7 (下方表格) 为表格 SITO GO enrichment data 概览。

(对应文件为 `Figure+Table/SITO-GO-enrichment-data.xlsx`)

注：表格共有 2405 行 12 列，以下预览的表格可能省略部分数据；含有 3 个唯一 'ont'。

1. pvalue: 显著性 P。
2. ont: One of "BP", "MF", and "CC" subontologies. The Cellular Component (CC), the Molecular Function (MF) and the Biological Process (BP).

Table 7: SITO GO enrichment data

ont	ID	Descri…	GeneRatio	BgRatio	pvalue	p.adjust	qvalue	geneID	Count
BP	GO:004…	regula…	15/37	433/18614	1.4579…	2.9742…	1.6528…	148/15…	15
BP	GO:190…	respon…	7/37	36/18614	5.3761…	5.4836…	3.0474…	1128/1…	7
BP	GO:190…	respon…	12/37	383/18614	5.6547…	3.8452…	2.1369…	1128/1…	12
BP	GO:006…	regula…	9/37	148/18614	1.0226…	5.2155…	2.8984…	154/11…	9
BP	GO:000…	G prot…	7/37	56/18614	1.4519…	5.9240…	3.2921…	1128/1…	7
BP	GO:000…	adenyl…	10/37	234/18614	2.1044…	7.1552…	3.9763…	148/14…	10
BP	GO:009…	acetyl…	6/37	31/18614	2.8612…	8.1337…	4.5201…	1128/1…	6
BP	GO:000…	regula…	9/37	173/18614	4.1766…	8.1337…	4.5201…	148/14…	9
BP	GO:000…	calciu…	12/37	455/18614	4.1950…	8.1337…	4.5201…	148/58…	12
BP	GO:190…	cellul…	6/37	33/18614	4.2917…	8.1337…	4.5201…	1128/1…	6
BP	GO:000…	muscle…	11/37	349/18614	4.7585…	8.1337…	4.5201…	148/14…	11
BP	GO:000…	phosph…	8/37	113/18614	4.7845…	8.1337…	4.5201…	148/14…	8
BP	GO:007…	calciu…	11/37	360/18614	6.6320…	1.0407…	5.7835…	148/58…	11
BP	GO:006…	excita…	8/37	124/18614	1.0137…	1.4771…	8.2087…	154/11…	8
BP	GO:009…	postsy…	6/37	39/18614	1.2534…	1.7046…	9.4734…	1128/1…	6
…	…	…	…	…	…	…	…	…	…

6.2.2 TCGA-BRCA

获取 TCGA-BRCA (RNA-seq) 数据，以备关联分析

Table 8 (下方表格) 为表格 BC metadata 概览。

(对应文件为 `Figure+Table/BC-metadata.xlsx`)

> 注：表格共有 1094 行 92 列，以下预览的表格可能省略部分数据；含有 1094 个唯一 'sample'。

1. sample: 样品名称
2. group: 分组名称

Table 8: BC metadata

sample	group	lib.size	norm.f…	barcode	patient	shortL…	defini…	sample……9	sample……10	…
TCGA-3…	Alive	567145041		TCGA-3…	TCGA-3…	TP	Primar…	TCGA-3…	01	…
TCGA-3…	Alive	375951791		TCGA-3…	TCGA-3…	TP	Primar…	TCGA-3…	01	…
TCGA-3…	Alive	225981541		TCGA-3…	TCGA-3…	TP	Primar…	TCGA-3…	01	…
TCGA-3…	Alive	527254451		TCGA-3…	TCGA-3…	TP	Primar…	TCGA-3…	01	…
TCGA-4…	Alive	474122611		TCGA-4…	TCGA-4…	TP	Primar…	TCGA-4…	01	…
TCGA-5…	Alive	342141291		TCGA-5…	TCGA-5…	TP	Primar…	TCGA-5…	01	…
TCGA-5…	Alive	242606631		TCGA-5…	TCGA-5…	TP	Primar…	TCGA-5…	01	…
TCGA-5…	Alive	335752871		TCGA-5…	TCGA-5…	TP	Primar…	TCGA-5…	01	…
TCGA-A…	Alive	475729491		TCGA-A…	TCGA-A…	TP	Primar…	TCGA-A…	01	…
TCGA-A…	Alive	605450031		TCGA-A…	TCGA-A…	TP	Primar…	TCGA-A…	01	…
TCGA-A…	Alive	610323511		TCGA-A…	TCGA-A…	TP	Primar…	TCGA-A…	01	…
TCGA-A…	Alive	488189181		TCGA-A…	TCGA-A…	TP	Primar…	TCGA-A…	01	…
TCGA-A…	Alive	564029211		TCGA-A…	TCGA-A…	TP	Primar…	TCGA-A…	01	…

sample	group	lib.size	norm.f…	barcode	patient	shortL…	defini…	sample……9	sample……10	…
TCGA-A…	Alive	685349391		TCGA-A…	TCGA-A…	TP	Primar…	TCGA-A…	01	…
TCGA-A…	Alive	733320591		TCGA-A…	TCGA-A…	TP	Primar…	TCGA-A…	01	…
…	…	…	…	…	…	…	…	…	…	…

6.2.3 糖酵解、巨噬细胞极化相关基因

Table 9 (下方表格) 为表格 MP related targets from GeneCards 概览。

(对应文件为 `Figure+Table/MP-related-targets-from-GeneCards.xlsx`)

注：表格共有 72 行 7 列，以下预览的表格可能省略部分数据；含有 72 个唯一 'Symbol'。

The GeneCards data was obtained by querying :

Macrophage polarization

Restrict (with quotes) :

TRUE

Filtering by Score: :

Score > 2

Table 9: MP related targets from GeneCards

Symbol	Description	Category	UniProt_ID	GIFtS	GC_id	Score
MIRLET7C	MicroRNA L…	RNA Gene (…		29	GC21P018103	6.28
GAS5	Growth Arr…	RNA Gene (…		31	GC01M173947	4.76
NR4A1AS	NR4A1 Anti…	RNA Gene (…		13	GC12M052059	4.37
LINC01672	Long Inter…	RNA Gene (…		19	GC01P020797	4.33
MIR125A	MicroRNA 125a	RNA Gene (…		29	GC19P113552	4.23
H19	H19 Imprin…	RNA Gene (…		34	GC11M001995	3.82
CERNA3	Competing …	RNA Gene (…		19	GC08P056323	3.76
STAT3	Signal Tra…	Protein Co…	P40763	62	GC17M042313	3.73
MIR146B	MicroRNA 146b	RNA Gene (…		29	GC10P102436	3.7
IL6	Interleukin 6	Protein Co…	P05231	60	GC07P022725	3.5
MIR98	MicroRNA 98	RNA Gene (…		26	GC0XM053782	3.42
TMX2-CTNND1	TMX2-CTNND…	RNA Gene (…		23	GC11P057712	3.39

Symbol	Description	Category	UniProt_ID	GIFtS	GC_id	Score
PLA2G5	Phospholip…	Protein Co…	P39877	46	GC01P020028	3.37
LINC02605	Long Inter…	RNA Gene (…		18	GC08P078838	3.15
IRF5	Interferon…	Protein Co…	Q13568	55	GC07P128937	3.14
…	…	…	…	…	…	…

Table 10 (下方表格) 为表格 GL related targets from GeneCards 概览。

(对应文件为 `Figure+Table/GL-related-targets-from-GeneCards.xlsx`)

注: 表格共有 118 行 7 列, 以下预览的表格可能省略部分数据; 含有 118 个唯一 'Symbol'。

The GeneCards data was obtained by querying :

glycolysis

Restrict (with quotes) :

TRUE

Filtering by Score: :

Score $>$ 3

Table 10: GL related targets from GeneCards

Symbol	Description	Category	UniProt_ID	GIFtS	GC_id	Score
TIGAR	TP53 Induc…	Protein Co…	Q9NQ88	45	GC12P038924	22.4
PKM	Pyruvate K…	Protein Co…	P14618	58	GC15M072199	20.77
HK2	Hexokinase 2	Protein Co…	P52789	55	GC02P074947	19.42
GAPDH	Glyceralde…	Protein Co…	P04406	59	GC12P038965	17.14
LDHA	Lactate De…	Protein Co…	P00338	59	GC11P018394	15.81
HIF1A	Hypoxia In…	Protein Co…	Q16665	57	GC14P061695	15.1
RRAD	RRAD, Ras …	Protein Co…	P55042	46	GC16M067483	15.1
HK1	Hexokinase 1	Protein Co…	P19367	59	GC10P069269	14.64
PKLR	Pyruvate K…	Protein Co…	P30613	55	GC01M155289	13.37
ENO1	Enolase 1	Protein Co…	P06733	56	GC01M008861	13.36
ENO3	Enolase 3	Protein Co…	P13929	54	GC17P004948	13.33
PFKP	Phosphofru…	Protein Co…	Q01813	53	GC10P003066	13.19
TPI1	Triosephos…	Protein Co…	P60174	55	GC12P006867	13.18
GLTC1	Glycolysis…	RNA Gene (…		2	GC11U909607	12.97

Symbol	Description	Category	UniProt_ID	GIFtS	GC_id	Score
PGK1	Phosphogly...	Protein Co...	P00558	57	GC0XP078166	12.94
...	...	...	...	...	...	...

6.2.4 关联分析

Figure 9 (下方图) 为图 Correlation heatmap 概览。

(对应文件为 `Figure+Table/Correlation-heatmap.pdf`)

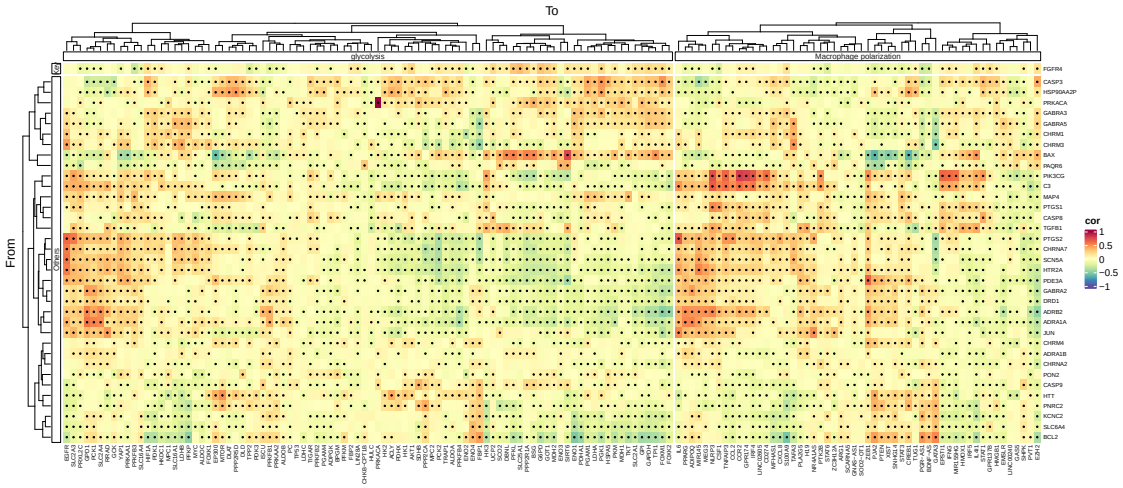

Figure 9: Correlation heatmap

'Linear curve' 数据已全部提供。

(对应文件为 `Figure+Table/Linear-curve`)

> 注：文件夹 Figure+Table/Linear-curve 共包含 2 个文件。
>
> 1. 1_glycolysis.pdf
> 2. 2_Macrophage polarization.pdf

6.2.5 韦恩图

Figure 10 (下方图) 为图 Intersection of Baihuasheshecao with Banzhilian with Zhebeimu 概览。

(对应文件为 `Figure+Table/Intersection-of-Baihuasheshecao-with-Banzhilian-with-Zhebeimu.pdf`)

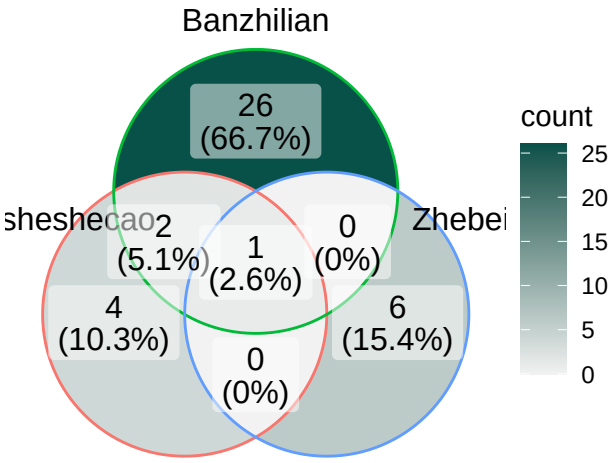

Figure 10: Intersection of Baihuasheshecao with Banzhilian with Zhebeimu

All_intersection :

beta-sitosterol

(上述信息框内容已保存至 `Figure+Table/Intersection-of-Baihuasheshecao-with-Banzhilian-with-Zhebeimu-content`

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