Supplementary Material

# Supplementary Figures and Tables

## Supplementary tables

**Table S1.** Detailed information on active compounds.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ID** | **MOL ID** | **Name** | **OB** | **DL** | **Inchi Key** | **Herb** |
| A1 | MOL002773 | beta-carotene | 37.18 | 0.58 | OENHQHLEOONYIE-JLTXGRSLSA-N | MF, EC |
| A2 | MOL000098 | quercetin | 46.43 | 0.28 | REFJWTPEDVJJIY-UHFFFAOYSA-N | MF, EC |
| A3 | MOL000358 | beta-sitosterol | 36.91 | 0.75 | KZJWDPNRJALLNS-VJSFXXLFSA-N | MF, EC |
| A4 | MOL000422 | kaempferol | 41.88 | 0.24 | IYRMWMYZSQPJKC-UHFFFAOYSA-N | MF, EC |
| EC1 | MOL009030 | Dehydrodieugenol | 30.1 | 0.24 | KETPSFSOGFKJJY-UHFFFAOYSA-N | EC |
| EC2 | MOL009015 | (-)-Tabernemontanine | 58.67 | 0.61 | FFVRRQMGGGTQRH-MSPRAJMNSA-N | EC |
| EC3 | MOL009031 | (9R)- 6'- methoxycinchonan-9-ol | 68.22 | 0.4 | LOUPRKONTZGTKE-AFHBHXEDSA-N | EC |
| EC4 | MOL000073 | ent-Epicatechin | 48.96 | 0.24 | PFTAWBLQPZVEMU-ZFWWWQNUSA-N | EC |
| EC5 | MOL011604 | Syringetin | 36.82 | 0.37 | UZMAPBJVXOGOFT-UHFFFAOYSA-N | EC |
| EC6 | MOL000211 | Mairin | 55.38 | 0.78 | QGJZLNKBHJESQX-FZFNOLFKSA-N | EC |
| EC7 | MOL009055 | hirsutin\_qt | 49.81 | 0.37 | UIZYKATWALCYCD-UHFFFAOYSA-N | EC |
| EC8 | MOL009057 | liriodendrin\_qt | 53.14 | 0.8 | KJHRHHLEZJFLDH-OZCSAQGGSA-N | EC |
| EC9 | MOL000443 | Erythraline | 49.18 | 0.55 | TVOFUERNMZTYRM-KBXCAEBGSA-N | EC |
| EC10 | MOL002058 | Medioresinol | 57.2 | 0.62 | VJOBNGRIBLNUKN-BMHXQBNDSA-N | EC |
| EC11 | MOL009053 | 4-[(2S,3R)-5-[(E)-3-hydroxyprop-1-enyl]-7-methoxy-3-methylol-2,3-dihydrobenzofuran-2-yl]-2-methoxy-phenol | 50.76 | 0.39 | KUSXBOZNRPQEON-LNFBDUAVSA-N | EC |
| EC12 | MOL004367 | olivil | 62.23 | 0.41 | BVHIKUCXNBQDEM-XMCHAPAWSA-N | EC |
| EC13 | MOL005922 | Acanthoside B | 43.35 | 0.77 | WEKCEGQSIIQPAQ-IRBNZIFYSA-N | EC |
| EC14 | MOL006709 | 8-Hydroxypinoresinol | 92.43 | 0.55 | CICMVLOHBZPXIT-WNISUXOKSA-N | EC |
| EC15 | MOL007059 | 3-beta-Hydroxymethyllenetanshiquinone | 32.16 | 0.41 | RUJKJFRMCYQMLH-ZDUSSCGKSA-N | EC |
| EC16 | MOL007563 | Yangambin | 57.53 | 0.81 | HRLFUIXSXUASEX-RZTYQLBFSA-N | EC |
| EC17 | MOL008240 | (E)-3-[4-[(1R,2R)-2-hydroxy-2-(4-hydroxy-3-methoxy-phenyl)-1-methylol-ethoxy]-3-methoxy-phenyl]acrolein | 56.32 | 0.36 | LWLOALZBDOVWAE-FMEUAVTJSA-N | EC |
| EC18 | MOL009007 | Eucommin A | 30.51 | 0.85 | GLGVEKKQPFRBAS-UOVCOODASA-N | EC |
| EC19 | MOL009009 | (+)-medioresinol | 87.19 | 0.62 | VJOBNGRIBLNUKN-HANNOOJCSA-N | EC |
| EC20 | MOL009038 | GBGB | 45.58 | 0.83 | FYZYXYLPBWLLGI-AUOPOVQUSA-N | EC |
| EC21 | MOL009027 | Cyclopamine | 55.42 | 0.82 | QASFUMOKHFSJGL-LAFRSMQTSA-N | EC |
| EC22 | MOL009029 | Dehydrodiconiferyl alcohol 4,gamma'-di-O-beta-D-glucopyanoside\_qt | 51.44 | 0.4 | GQNBCFQSSDOEHP-LNFBDUAVSA-N | EC |
| EC23 | MOL009042 | Helenalin | 77.01 | 0.19 | ZVLOPMNVFLSSAA-XEPQRQSNSA-N | EC |
| EC24 | MOL009047 | (+)-Eudesmin | 33.29 | 0.62 | PEUUVVGQIVMSAW-RZTYQLBFSA-N | EC |
| MF1 | MOL007879 | Tetramethoxyluteolin | 43.68 | 0.37 | CLXVBVLQKLQNRQ-UHFFFAOYSA-N | MF |
| MF2 | MOL003759 | Iristectorigenin A | 63.36 | 0.34 | CCRPIWFQMLICCY-UHFFFAOYSA-N | MF |
| MF3 | MOL003975 | icosa-11,14,17-trienoic acid methyl ester | 44.81 | 0.23 | XQAVRBUXEPJVRC-JSIPCRQOSA-N | MF |
| MF4 | MOL001439 | arachidonic acid | 45.57 | 0.2 | YZXBAPSDXZZRGB-DOFZRALJSA-N | MF |
| MF5 | MOL000433 | FA | 68.96 | 0.71 | OVBPIULPVIDEAO-LBPRGKRZSA-N | MF |
| MF6 | MOL000449 | Stigmasterol | 43.83 | 0.76 | HCXVJBMSMIARIN-PHZDYDNGSA-N | MF |
| MF7 | MOL000729 | Oxysanguinarine | 46.97 | 0.87 | UFHGABBBZRPRJV-UHFFFAOYSA-N | MF |
| MF8 | MOL001506 | Supraene | 33.55 | 0.42 | YYGNTYWPHWGJRM-AAJYLUCBSA-N | MF |
| MF9 | MOL001771 | poriferast-5-en-3beta-ol | 36.91 | 0.75 | KZJWDPNRJALLNS-FBZNIEFRSA-N | MF |
| MF10 | MOL002218 | scopolin | 56.45 | 0.39 | SGTCGCCQZOUMJJ-YMILTQATSA-N | MF |
| MF11 | MOL003842 | Albanol | 83.16 | 0.24 | MJJWBJFYYRAYKU-FJPSCYHJSA-N | MF |
| MF12 | MOL003847 | Inophyllum E | 38.81 | 0.85 | YRHQANFINIANSK-UHFFFAOYSA-N | MF |
| MF13 | MOL003850 | 26-Hydroxy-dammara-20,24-dien-3-one | 44.41 | 0.79 | GQNLRMVMODTKOO-YUICVKHOSA-N | MF |
| MF14 | MOL003851 | Isoramanone | 39.97 | 0.51 | NWFNMRFBJUONKD-YJQDOJAJSA-N | MF |
| MF15 | MOL003856 | Moracin B | 55.85 | 0.23 | GOUSNRMGQRTROZ-UHFFFAOYSA-N | MF |
| MF16 | MOL003857 | Moracin C | 82.13 | 0.29 | ZTGHWUWBQNCCOH-UHFFFAOYSA-N | MF |
| MF17 | MOL003858 | Moracin D | 60.93 | 0.38 | CHAAQDMHLLQJRO-UHFFFAOYSA-N | MF |
| MF18 | MOL003859 | Moracin E | 56.08 | 0.38 | GDSYWTBPYYYLLE-UHFFFAOYSA-N | MF |
| MF19 | MOL003860 | Moracin F | 53.81 | 0.23 | MQRQKQBOYQLFAI-UHFFFAOYSA-N | MF |
| MF20 | MOL003861 | Moracin G | 75.78 | 0.42 | PRQYZCKJWCQXNM-UHFFFAOYSA-N | MF |
| MF21 | MOL003862 | Moracin H | 74.35 | 0.51 | QRLJHLHVDMQXPO-UHFFFAOYSA-N | MF |
| MF22 | MOL003879 | 4-Prenylresveratrol | 40.54 | 0.21 | WWFOQQIWOKJBSJ-PLNGDYQASA-N | MF |
| MF23 | MOL006630 | Norartocarpetin | 54.93 | 0.24 | ZSYPIPFQOQGYHH-UHFFFAOYSA-N | MF |
| MF24 | MOL007179 | Linolenic acid ethyl ester | 46.1 | 0.2 | JYYFMIOPGOFNPK-AGRJPVHOSA-N | MF |
| MF25 | MOL013083 | Skimmin (8CI) | 38.35 | 0.32 | VPAOSFFTKWUGAD-TVKJYDDYSA-N | MF |

**Table S2.** 204 common targets (Table S3) between MFEC targets and disease-related targets.

|  |  |  |
| --- | --- | --- |
| **Target** | **Gene symbol** | **Compound** |
| ATP-binding cassette sub-family A member 1 | ABCA1 | MF4 |
| ATP-binding cassette sub-family G member 2 | ABCG2 | A2 |
| Tyrosine-protein kinase ABL | ABL1 | EC1 |
| Adenosine A2a receptor | ADORA2A | EC1, EC20, MF3 |
| Beta-2 adrenergic receptor | ADRB2 | A2, A3, EC2, EC3, EC6, EC15, EC24, MF6, MF22 |
| Aryl hydrocarbon receptor | AHR | A2, A4 |
| RAC-alpha serine/threonine-protein kinase | AKT1 | A1, A2, A4 |
| ALK tyrosine kinase receptor | ALK | EC1 |
| Arachidonate 5-lipoxygenase | ALOX5 | A2, A4, EC1, MF3, MF4 |
| Androgen receptor | AR | A2, A4, EC2, EC5, EC21, MF1, MF2, MF12, MF13, MF15, MF17, MF18, MF23 |
| Apoptosis regulator BAX | BAX | A2, A3, A4 |
| Apoptosis regulator Bcl-2 | BCL2 | A1, A2, A3, A4, MF3, MF11 |
| Bcl-2-like protein 1 | BCL2L1 | A2, MF11 |
| Baculoviral IAP repeat-containing protein 5 | BIRC5 | A2 |
| Bromodomain-containing protein 4 | BRD4 | EC1, MF13 |
| Carbonic anhydrase II | CA2 | EC7, EC15, EC20, MF25 |
| Caspase-3 | CASP3 | A1, A2, A3, A4, MF4, MF5 |
| Caspase-7 | CASP7 | A1 |
| Caspase-8 | CASP8 | A1, A2, A3 |
| Caspase-9 | CASP9 | A1, A2, A3 |
| Calcium sensing receptor | CASR | MF3 |
| Caveolin-1 | CAV1 | A1, A2 |
| C-C motif chemokine 2 | CCL2 | A2 |
| Cyclin-A2 | CCNA2 | EC1, EC5, EC17, EC22, MF2, MF16, MF22 |
| G2/mitotic-specific cyclin-B1 | CCNB1 | A2, EC1 |
| G1/S-specific cyclin-D1 | CCND1 | A2, MF4 |
| Cyclin T1 | CCNT1 | EC1 |
| CD40 ligand | CD40LG | A2 |
| Dual specificity phosphatase Cdc25A | CDC25A | MF13 |
| Cell division control protein 2 homolog | CDK1 | A2, A4, EC1, MF3 |
| Cell division protein kinase 2 | CDK2 | EC1, EC5, EC17, MF1, MF2, MF17, MF18, MF20, MF22 |
| Cell division protein kinase 4 | CDK4 | EC1, MF4 |
| Cell division protein kinase 5 | CDK5 | EC1 |
| Cell division protein kinase 9 | CDK9 | EC1 |
| Cyclin-dependent kinase inhibitor 1 | CDKN1A | A2 |
| Cyclin-dependent kinase inhibitor 2A, isoforms 1/2/3 | CDKN2A | A2 |
| Cholesteryl ester transfer protein | CETP | MF4 |
| Serine/threonine-protein kinase Chk1 | CHEK1 | MF1, MF2 |
| Serine/threonine-protein kinase Chk2 | CHEK2 | A2 |
| Neuronal acetylcholine receptor protein, alpha-7 chain | CHRNA7 | A3, EC2, EC3, EC9, EC15, MF6 |
| Inhibitor of nuclear factor kappa-B kinase subunit alpha | CHUK | A2 |
| Cannabinoid receptor 1 | CNR1 | EC1, MF3 |
| Cannabinoid receptor 2 | CNR2 | EC1, MF3, MF8 |
| C-reactive protein | CRP | A2 |
| Catenin beta-1 | CTNNB1 | A1 |
| Cathepsin D | CTSD | A2 |
| Cathepsin G | CTSG | EC1 |
| C-X-C motif chemokine 10 | CXCL10 | A2 |
| C-X-C motif chemokine 11 | CXCL11 | A2 |
| C-X-C motif chemokine 2 | CXCL2 | A2 |
| Interleukin-8 receptor B | CXCR2 | EC1 |
| Cytochrome P450 17A1 | CYP17A1 | MF13 |
| Cytochrome P450 19A1 | CYP19A1 | EC18, MF3, MF11, MF13 |
| Cytochrome P450 1A1 | CYP1A1 | A2, A4 |
| Cytochrome P450 3A4 | CYP3A4 | A1, A2, A4 |
| Dihydrofolate reductase | DHFR | MF5 |
| Dipeptidyl peptidase IV | DPP4 | A2, A4, EC5, EC11, EC15, EC17, EC22, MF1, MF2 |
| D(2) dopamine receptor | DRD2 | EC2, EC3 |
| Transcription factor E2F1 | E2F1 | A2 |
| Pro-epidermal growth factor | EGF | A2, MF4 |
| Epidermal growth factor receptor | EGFR | A2, EC1, EC3 |
| Leukocyte elastase | ELANE | EC1 |
| ETS domain-containing protein Elk-1 | ELK1 | A2 |
| Ephrin receptor | EPHB4 | EC1 |
| Receptor tyrosine-protein kinase erbB-2 | ERBB2 | A2, EC1 |
| Receptor tyrosine-protein kinase erbB-3 | ERBB3 | A2 |
| Estrogen receptor | ESR1 | EC4, EC5, EC11, EC17, EC22, MF2, MF12, MF15, MF16, MF17, MF18, MF20, MF21, MF22 |
| Estrogen receptor beta | ESR2 | EC5, EC7, MF1, MF2, MF12, MF15, MF17, MF18 |
| Thrombin | F2 | MF11 |
| Tissue factor | F3 | A1, A2 |
| Fibroblast growth factor receptor 1 | FGFR1 | EC1 |
| Vascular endothelial growth factor receptor 1 | FLT1 | EC1 |
| Tyrosine-protein kinase receptor FLT3 | FLT3 | EC1 |
| Proto-oncogene c-Fos | FOS | A2 |
| Glucose-6-phosphate 1-dehydrogenase | G6PD | MF4 |
| Gap junction alpha-1 protein | GJA1 | A1, A2 |
| Glutamate [NMDA] receptor subunit epsilon 2 | GRIN2B | MF3 |
| Glycogen synthase kinase-3 beta | GSK3B | EC1, EC5, EC7, EC17, MF1, MF2, MF12, MF17, MF18, MF20, MF22 |
| Glutathione S-transferase P | GSTP1 | A2, A4 |
| Beta-glucuronidase | GUSB | EC1 |
| Histone deacetylase 1 | HDAC1 | EC1, MF5 |
| Histone deacetylase 3 | HDAC3 | EC1 |
| Histone deacetylase 6 | HDAC6 | MF5 |
| Hypoxia-inducible factor 1-alpha | HIF1A | A2, EC13, EC18 |
| Heme oxygenase 1 | HMOX1 | A1, A2, A4 |
| Heat shock factor protein 1 | HSF1 | A2 |
| Heat shock protein HSP 90-alpha | HSP90AA1 | A2, A3, A4, EC2, EC3, EC4, EC5, EC7, EC10, EC11, EC12, EC15, EC17, EC19, EC22, EC24, MF1, MF2, MF15, MF16, MF17, MF18, MF19, MF23, MF25 |
| Heat shock protein HSP 90-beta | HSP90AB1 | A2, A3, A4, EC1, EC2, EC3, EC4, EC5, EC7, EC10, EC11, EC12, EC15, EC17, EC19, EC22, EC24, MF1, MF2, MF15, MF16, MF17, MF18, MF19, MF23, MF25 |
| Heat shock protein beta-1 | HSPB1 | A2 |
| Intercellular adhesion molecule 1 | ICAM1 | A2, A4, MF3 |
| Isocitrate dehydrogenase [NADP] cytoplasmic | IDH1 | MF3 |
| Interferon gamma | IFNG | A2 |
| Insulin-like growth factor II | IGF2 | A2 |
| Insulin-like growth factor-binding protein 3 | IGFBP3 | A2 |
| Ig gamma-1 chain C region | IGHG1 | EC7, EC15, MF6 |
| Inhibitor of nuclear factor kappa-B kinase subunit beta | IKBKB | A4 |
| Interleukin-10 | IL10 | A2 |
| Interleukin-1 alpha | IL1A | A2 |
| Interleukin-1 beta | IL1B | A2 |
| Interleukin-2 | IL2 | A2 |
| Interleukin-6 | IL6 | A2 |
| Insulin receptor | INSR | A2, A4, EC1 |
| Interferon regulatory factor 1 | IRF1 | A2 |
| Integrin alpha-L | ITGAL | MF3 |
| Integrin beta-2 | ITGB2 | MF3 |
| Tyrosine-protein kinase JAK2 | JAK2 | EC1 |
| Tyrosine-protein kinase JAK3 | JAK3 | EC1 |
| Transcription factor AP-1 | JUN | A1, A2, A3, A4 |
| Calcium-activated potassium channel subunit alpha 1 | KCNMA1 | EC1, EC16, MF1 |
| Lysine-specific histone demethylase 1 | KDM1A | EC1 |
| Vascular endothelial growth factor receptor 2 | KDR | EC1, EC7, MF3 |
| Tyrosine-protein kinase LCK | LCK | EC1 |
| Mitogen-activated protein kinase 1 | MAPK1 | A2, MF4 |
| Mitogen-activated protein kinase 14 | MAPK14 | EC5, EC7, EC17, MF1, MF2, MF13, MF17, MF18, MF20, MF22 |
| Mitogen-activated protein kinase 8 | MAPK8 | A4 |
| Induced myeloid leukemia cell differentiation protein Mcl-1 | MCL1 | EC13, EC18, MF3 |
| p53-binding protein Mdm-2 | MDM2 | EC1 |
| Hepatocyte growth factor receptor | MET | EC1 |
| Neprilysin | MME | MF5 |
| Interstitial collagenase | MMP1 | A1, A2, A4, EC1 |
| 72 kDa type IV collagenase | MMP2 | A1, A2, EC1 |
| Stromelysin-1 | MMP3 | A2 |
| Matrix metalloproteinase-9 | MMP9 | A2, EC1 |
| Myeloperoxidase | MPO | A2 |
| Serine/threonine-protein kinase mTOR | MTOR | EC1, MF11 |
| Myc proto-oncogene protein | MYC | A1, A2 |
| Neutrophil cytosol factor 1 | NCF1 | A2 |
| Nuclear factor erythroid 2-related factor 2 | NFE2L2 | A2 |
| NF-kappa-B inhibitor alpha | NFKBIA | A2 |
| Nitric oxide synthase, inducible | NOS2 | A4, EC5, EC7, MFMF1, MF2, MF13, MF17, MF18, MF21 |
| Nitric oxide synthase, endothelial | NOS3 | A2, MF4 |
| NAD(P)H dehydrogenase [quinone] 1 | NQO1 | A2, EC1 |
| LXR-alpha | NR1H3 | MF3, MF13 |
| Nuclear receptor subfamily 1 group I member 2 | NR1I2 | A2, A4 |
| Glucocorticoid receptor | NR3C1 | EC21, MF13 |
| Mineralocorticoid receptor | NR3C2 | EC21, MF6, MF14 |
| Ornithine decarboxylase | ODC1 | A2 |
| Delta-type opioid receptor | OPRD1 | EC2, EC3, EC9, EC15 |
| Mu-type opioid receptor | OPRM1 | A3, EC2, EC3, EC9, EC15 |
| Poly [ADP-ribose] polymerase 1 | PARP1 | A2, EC1 |
| Phosphodiesterase 4A | PDE4A | MF3 |
| Platelet-derived growth factor receptor beta | PDGFRB | EC1 |
| Platelet endothelial cell adhesion molecule | PECAM1 | MF4 |
| Progesterone receptor | PGR | A3, A4, EC6, MF6, MF9. MF14 |
| PI3-kinase p110-alpha subunit | PIK3CA | EC1 |
| PI3-kinase p110-beta subunit | PIK3CB | EC1 |
| PI3-kinase p110-delta subunit | PIK3CD | EC1 |
| PI3-kinase p110-gamma subunit | PIK3CG | A2, A3, A4, EC1, EC2, EC9, MF17 |
| Proto-oncogene serine/threonine-protein kinase Pim-1 | PIM1 | EC1, EC5, EC11, EC17, EC22, MF2, MF12, MF22 |
| Cytosolic phospholipase A2 | PLA2G4A | MF4 |
| Tissue-type plasminogen activator | PLAT | A2 |
| Urokinase-type plasminogen activator | PLAU | A2, MF6, MF11 |
| Plasminogen | PLG | MF11 |
| Peroxisome proliferator-activated receptor alpha | PPARA | A2, MF3, MF8 |
| Peroxisome proliferator-activated receptor delta | PPARD | A2, MF3 |
| Peroxisome proliferator activated receptor gamma | PPARG | A2, A4, EC5, EC17, MF1, MF2, MF3, MF4, MF16, MF17, MF18MF22 |
| Protein kinase C alpha type | PRKCA | A2, A3 |
| Protein kinase C beta type | PRKCB | A2, MF4, MF13 |
| Protein kinase C delta | PRKCD | MF13 |
| Protein kinase C epsilon | PRKCE | MF13 |
| Protein kinase C theta | PRKCQ | MF13 |
| Phosphatidylinositol-3,4,5-trisphosphate 3-phosphatase and dual-specificity protein phosphatase PTEN | PTEN | A2, MF4 |
| Prostaglandin G/H synthase 1 | PTGS1 | A2, A3, A4, EC2, EC3, EC4, EC7, EC9, EC10, EC18, MF1, MF2, MF3, MF4, MF6, MF7, MF12, MF22, MF23, MF24 |
| Prostaglandin G/H synthase 2 | PTGS2 | A1, A2, A3, A4, EC2, EC3, EC4, EC5, EC7, EC9, EC10, EC11, EC12, EC14, EC15, EC16, EC17, EC19, EC22, EC24, MF1, MF2, MF3, MF4, MF10, MF12, MF17, MF18, MF21, MF22, MF23, MF24, MF25 |
| mRNA of Protein-tyrosine phosphatase, non-receptor type 1 | PTPN1 | EC13, MF3, MF10, MF11, MF13, MF25 |
| RAF proto-oncogene serine/threonine-protein kinase | RAF1 | A2, MF3 |
| Retinoic acid receptor alpha | RARA | MF3 |
| Retinoic acid receptor beta | RARB | MF3 |
| Retinoblastoma-associated protein | RB1 | A2 |
| Transcription factor p65 | RELA | A2, A4, MF4 |
| Rho-associated protein kinase 1 | ROCK1 | MF3 |
| Nuclear receptor ROR-gamma | RORC | MF3 |
| Runt-related transcription factor 2 | RUNX2 | A2 |
| Retinoic acid receptor RXR-alpha | RXRA | A2, EC3, EC9, EC15, MF1, MF3, MF4, MF6 |
| Sodium channel protein type 5 subunit alpha | SCN5A | A2, A3, EC2, EC3, EC5, EC7, EC9, EC10, EC16, EC19, EC24, MF1, MF2, MF6, MF21, MF22 |
| E-selectin | SELE | A2, A4 |
| P-selectin | SELP | MF4 |
| Plasminogen activator inhibitor 1 | SERPINE1 | A2 |
| Solute carrier family 2, facilitated glucose transporter member 4 | SLC2A4 | A2, A4 |
| Sodium-dependent serotonin transporter | SLC6A4 | A3, EC2, EC3 |
| Antileukoproteinase | SLPI | A4 |
| Acyl coenzyme A:cholesterol acyltransferase 1 | SOAT1 | EC13, EC18 |
| Superoxide dismutase [Cu-Zn] | SOD1 | A2 |
| Osteopontin | SPP1 | A2 |
| Tyrosine-protein kinase SRC | SRC | MF4 |
| Matriptase | ST14 | MF11 |
| Signal transducer and activator of transcription 1-alpha | STAT1 | A2, A4 |
| Tyrosine-protein kinase SYK | SYK | EC1 |
| Telomerase reverse transcriptase | TERT | MF3 |
| Transforming growth factor beta-1 | TGFB1 | A2, A3 |
| TGF-beta receptor type I | TGFBR1 | EC1 |
| Thrombomodulin | THBD | A2 |
| Toll-like receptor (TLR7) | TLR7 | EC1 |
| Tumor necrosis factor | TNF | A2, A4, MF13 |
| Tumor necrosis factor receptor superfamily member 1A | TNFRSF1A | MF4 |
| Tumor necrosis factor receptor superfamily member 1B | TNFRSF1B | MF4 |
| DNA topoisomerase 2-alpha | TOP2A | A2 |
| Cellular tumor antigen p53 | TP53 | A2 |
| Tyrosinase | TYR | EC18 |
| Vascular cell adhesion protein 1 | VCAM1 | A2, A4 |
| Vascular endothelial growth factor A | VEGFA | A1, A2 |
| Xanthine dehydrogenase/oxidase | XDH | A2, A4 |

**Table S3.** The information of active ingredients including 2D structure.

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Name** | **2D Structure** | **Database** |
| A1 | beta-carotene |  | TCMSP |
| A2 | quercetin | A2 | TCMSP |
| A3 | beta-sitosterol |  | TCMSP |
| A4 | kaempferol |  | TCMSP |
| EC1 | Dehydrodieugenol |  | TCMSP |
| EC2 | (A1-)-Tabernemontanine |  | TCMSP |
| EC3 | (9R)- 6'- methoxycinchonan-9-ol |  | TCMSP |
| MF1 | Tetramethoxyluteolin |  | TCMSP |
| MF2 | Iristectorigenin A |  | TCMSP |
| MF3 | icosa-11,14,17-trienoic acid methyl ester |  | TCMSP |
| MF4 | arachidonic acid |  | TCMSP |

**Table S4.** The softwares and databases used in this study.

|  |  |  |
| --- | --- | --- |
| **Name** | **Version** | **The url** |
| TCMSP |  | https://www.tcmsp-e.com/ |
| Pubchem |  | https://pubchem.ncbi.nlm.nih.gov/ |
| SwissTargetPrediction |  | http://swisstargetprediction.ch/ |
| GeneCards |  | https://www.genecards.org/ |
| Cytoscape | 3.8.1 |  |
| UniProt |  | https://www.uniprot.org/ |
| Venny | 2.1 | https://bioinfogp.cnb.csic.es/tools/venny/ |
| String | 11.5 | https://www.string-db.org/cgi/input?sessionId=bSwSO9xSIj50&input\_page\_active\_form=multiple\_identifiers |
| Metascape |  | https://metascape.org/gp/index.html#/main/step1 |
| Chem 3D | 19.0 |  |
| RCSB PDB |  | https://www.rcsb.org/ |
| Sybyl-X | 2.1.1 |  |

**Table S5.** KEGG pathway analysis of MFEC to treat immune suppression.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Term ID | Description | P Value | Enrichment | Count |
| hsa05200 | Pathways in cancer | 5.22711E-37 | 19.63257421 | 82 |
| ko04933 | AGE-RAGE signaling pathway in diabetic complications | 5.89259E-24 | 51.5409487 | 37 |
| ko05418 | Fluid shear stress and atherosclerosis | 2.43812E-23 | 38.84700359 | 40 |
| hsa04933 | AGE-RAGE signaling pathway in diabetic complications | 2.68872E-23 | 47.68741983 | 37 |
| hsa05418 | Fluid shear stress and atherosclerosis | 5.55178E-23 | 37.27212507 | 40 |
| hsa05161 | Hepatitis B | 5.89127E-23 | 32.72366235 | 42 |
| hsa05215 | Prostate cancer | 7.5885E-23 | 48.67301038 | 36 |
| hsa05167 | kaposi sarcoma-associated herpesvirus infection | 1.04074E-20 | 28.43440469 | 40 |
| ko05215 | Prostate cancer | 1.14496E-20 | 50.72436331 | 32 |
| hsa05166 | Human T-cell leukemia virus 1 infection | 1.53341E-20 | 21.03664008 | 45 |
| hsa04151 | PI3K-Akt signaling pathway | 3.87349E-20 | 17.41981424 | 48 |
| hsa05163 | human cytomegalovirus infection | 1.17483E-19 | 23.55908905 | 41 |
| hsa05160 | Hepatitis C | 1.21346E-19 | 30.19262675 | 37 |
| ko04151 | PI3K-Akt signaling pathway | 1.26524E-18 | 17.74240339 | 44 |
| ko05166 | HTLV-I infection | 1.78412E-18 | 21.5479473 | 40 |
| hsa04668 | TNF signaling pathway | 6.65578E-18 | 37.17489344 | 31 |
| hsa05205 | Proteoglycans in cancer | 9.97559E-18 | 23.40621065 | 37 |
| hsa05212 | Pancreatic cancer | 1.08881E-17 | 47.09014825 | 28 |
| ko05205 | Proteoglycans in cancer | 1.40921E-17 | 24.45638945 | 36 |
| ko04668 | TNF signaling pathway | 1.53644E-17 | 38.30746187 | 30 |