

Resource Summary Report

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Small Molecule Pathway Database

RRID:SCR_004844

Type: Tool

Proper Citation

Small Molecule Pathway Database (RRID:SCR_004844)

Resource Information

URL: <http://www.smpdb.ca/>

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Description: An interactive, visual database containing more than 350 small molecule pathways found in humans. More than 2/3 of these pathways (>280) are not found in any other pathway database. SMPDB is designed specifically to support pathway elucidation and pathway discovery in metabolomics, transcriptomics, proteomics and systems biology. It is able to do so, in part, by providing exquisitely detailed, fully searchable, hyperlinked diagrams of human metabolic pathways, metabolic disease pathways, metabolite signaling pathways and drug-action pathways. All SMPDB pathways include information on the relevant organs, subcellular compartments, protein cofactors, protein locations, metabolite locations, chemical structures and protein quaternary structures. Each small molecule is hyperlinked to detailed descriptions contained in the HMDB or DrugBank and each protein or enzyme complex is hyperlinked to UniProt. All SMPDB pathways are accompanied with detailed descriptions and references, providing an overview of the pathway, condition or processes depicted in each diagram. The database is easily browsed and supports full text, sequence and chemical structure searching. Users may query SMPDB with lists of metabolite names, drug names, genes / protein names, SwissProt IDs, GenBank IDs, Affymetrix IDs or Agilent microarray IDs. These queries will produce lists of matching pathways and highlight the matching molecules on each of the pathway diagrams. Gene, metabolite and protein concentration data can also be visualized through SMPDB's mapping interface. All of SMPDB's images, image maps, descriptions and tables are downloadable.

Abbreviations: SMPDB

Synonyms: SMPDB (The Small Molecule Pathway Database), Small Molecule Pathway Database (SMPDB)

Resource Type: service resource, data analysis service, image, data or information resource, database, production service resource, analysis service resource

Defining Citation: [PMID:19948758](#)

Keywords: metabolomics, transcriptomics, proteomics, systems biology, small molecule, pathway, human, metabolic pathway, metabolic disease pathway, metabolite signaling pathway, drug-action pathway, bio.tools, FASEB list

Funding: Genome Alberta ;
Genome Canada

Resource Name: Small Molecule Pathway Database

Resource ID: SCR_004844

Alternate IDs: nlx_143926, biotools:smpdb, r3d100012753

Alternate URLs: <https://bio.tools/smpdb>, <https://doi.org/10.17616/R3TB93>

Record Creation Time: 20220129T080226+0000

Record Last Update: 20260731T042704+0000

Ratings and Alerts

No rating or validation information has been found for Small Molecule Pathway Database.

No alerts have been found for Small Molecule Pathway Database.

Data and Source Information

Source: [SciCrunch Registry](#)

Usage and Citation Metrics

We found 95 mentions in open access literature.

Listed below are recent publications. The full list is available at [kravitz2](#) .

Takano F, et al. (2025) Nitric Oxide May Adversely Affect the Metabolism and Viability of Retinal Organoids Derived from Patients with Leber Hereditary Optic Neuropathy. The American journal of pathology, 195(9), 1693.

Xu M, et al. (2025) Deciphering the causal relationships between plasma metabolites, peripheral cells, inflammatory factors and DLBCL for discovering novel therapeutic targets. Discover oncology, 16(1), 1968.

Tabata S, et al. (2024) Metabolic Hallmarks for Purine Nucleotide Biosynthesis in Small Cell Lung Carcinoma. Molecular cancer research : MCR, 22(1), 82.

Hou R, et al. (2024) Stabilization of SQLE mRNA by WTAP/FTO/IGF2BP3-dependent manner in HGSOc: implications for metabolism, stemness, and progression. Cell death & disease, 15(12), 872.

Elaimy AL, et al. (2024) SLC4A11 mediates ammonia import and promotes cancer stemness in hepatocellular carcinoma. JCI insight, 9(21).

Tanasi D, et al. (2024) Multianalytical investigation reveals psychotropic substances in a ptolemaic Egyptian vase. Scientific reports, 14(1), 27891.

Okinaka Y, et al. (2024) Metabolomic profiling of cancer-related fatigue involved in cachexia and chemotherapy. Scientific reports, 14(1), 8329.

Nakasuka F, et al. (2024) The role of cytidine 5'-triphosphate synthetase 1 in metabolic rewiring during epithelial-to-mesenchymal transition in non-small-cell lung cancer. FEBS open bio, 14(9), 1570.

Zhang X, et al. (2024) Fibroblast growth factor 21 alleviates diabetes-induced cognitive decline. Cerebral cortex (New York, N.Y. : 1991), 34(2).

Course CW, et al. (2024) Similarities of metabolomic disturbances in prematurity-associated obstructive lung disease to chronic obstructive pulmonary disease. Scientific reports, 14(1), 23294.

Rejali L, et al. (2024) Comprehensive analysis identifies endocrine fibroblast growth factors as promising prognostic markers for colorectal carcinoma. Scientific reports, 14(1), 28754.

Razavi SA, et al. (2024) Metabolite signature of human malignant thyroid tissue: A systematic review and meta-analysis. Cancer medicine, 13(8), e7184.

Yoon CK, et al. (2023) Vitreous Fatty Amides and Acyl Carnitines Are Altered in Intermediate Age-Related Macular Degeneration. Investigative ophthalmology & visual science, 64(3), 28.

Xu FR, et al. (2023) The hypothalamic steroidogenic pathway mediates susceptibility to inflammation-evoked depression in female mice. Journal of neuroinflammation, 20(1), 293.

Wang Q, et al. (2023) Metabolic heterogeneity in adrenocortical carcinoma impacts patient outcomes. JCI insight, 8(16).

Li M, et al. (2023) Supraphysiologic doses of 17 β -estradiol aggravate depression-like behaviors in ovariectomized mice possibly via regulating microglial responses and brain glycerophospholipid metabolism. Journal of neuroinflammation, 20(1), 204.

Sungthong R, et al. (2023) How do prolonged anchorage-free lifetimes strengthen non-small-cell lung cancer cells to evade anoikis? - A link with altered cellular metabolomics. Biological research, 56(1), 44.

Sajid MI, et al. (2023) Untargeted metabolomics analysis on kidney tissues from mice reveals potential hypoxia biomarkers. Scientific reports, 13(1), 17516.

Milano M, et al. (2022) Challenges and Limitations of Biological Network Analysis. Biotech (Basel (Switzerland)), 11(3).

Shi M, et al. (2022) CRISPR/Cas9-mediated knockout of SGLT1 inhibits proliferation and alters metabolism of gastric cancer cells. Cellular signalling, 90, 110192.