MEDVOLT

Medvolt Overview

A deep-tech company involved in AI-enabled Knowledge Discovery and Curation with proprietary databases & in-house insilico platform - MedGraph for accelerating Pharma R&D

Actionable Insights → Accelerated Decisions → Better Outcomes

- 10M+ Curated Data-points
- 15+ AI & Simulation models
- Externally Validated

RAG-enabled Information Retrieval

MedGraph EDGE: Depth & Breadth for Pharma R&D

GWAS Catalog, Google Patents, FDA, NIH NCBI, PubMed/PMC, CPDB, HGNC, ZINC, dbSNP, Entrez, medRxiv, PDBBind, UniProt, NCBI GEO, MeSH, PDB, GENEONTOLOGY, uniChem, TTD, ChEMBL, DrugBank, PubChem, arXiv/bioRxiv, BindingDB, Reactome, Open Targets, ClinicalTrials.gov
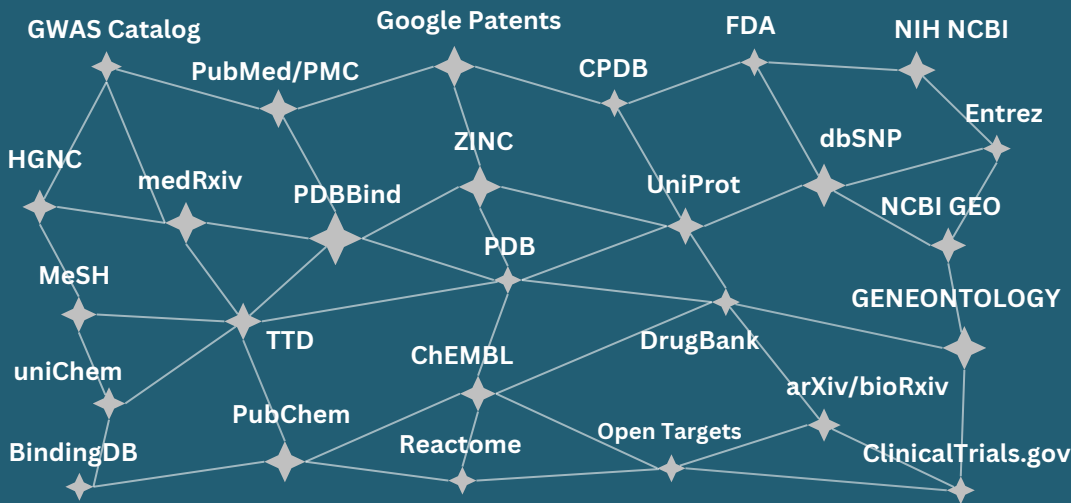
FEATURES
- Open + Proprietary datasources
- Structured & organized
- Graph & ontology enrichment
- Cutting-edge NLP/AI/ML
- Expert curation
- Contextual Causality
- Semantic Search
- FAIR friendly
- Updated regularly
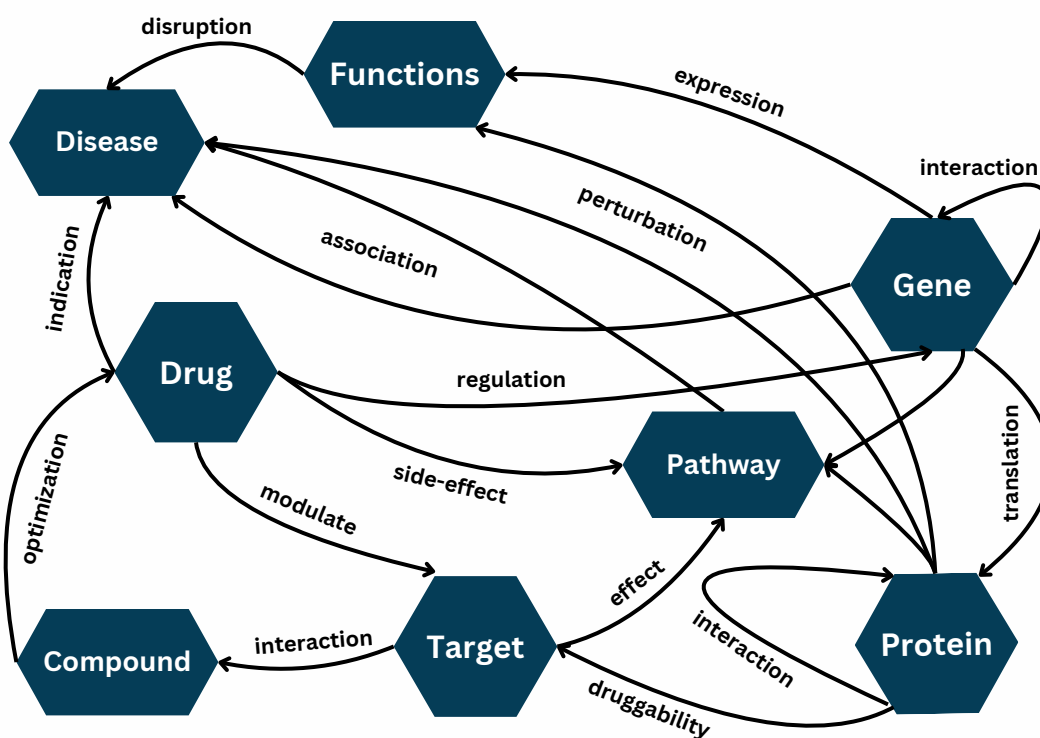
Knowledge Graph with Ontology Enrichment

Nodes: Functions, Disease, Gene, Drug, Pathway, Compound, Target, Protein

Edges: disruption, expression, interaction, perturbation, association, indication, regulation, translation, side-effect, modulate, optimization, effect, interaction, druggability

Pipeline:
Data Aggregation → Preprocessing & Integration → AI-enabled Information Retrieval → Knowledge Graph → AI-enhanced Insights → Validation → Report Generation

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Biomedical landscape: Multi-Omics Data

Targets
Diseases
In vivo/ In vitro data
Genes
Pathways
Proteins
PP Interactions
Chemicals
KOL
Drugs
Clinical Indications
Variants

Data extraction & mining (NLP & AI)

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Data cleaning & wrangling (NLP)

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Annotataed Databases (AI)

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Data Visualization and analytics (KG)
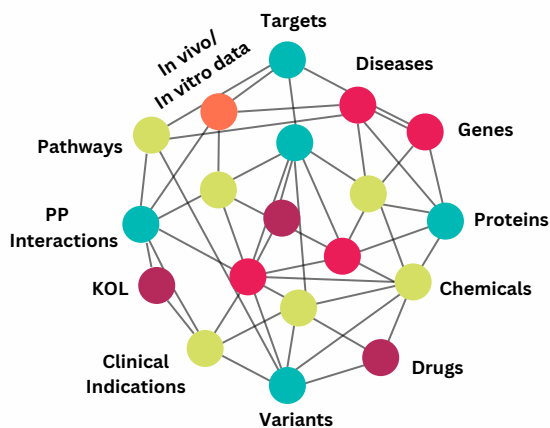
Dataset curation & annotation of 'omics data, for establishing robust relationships delineating disease mechanisms pointing to biomarkers for diagnostics and therapeutics applications, from hundreds of attributes resulting in thousands of variants mapped to multiple genes, proteins and phenotypes, is critical to understand etiology of diseases. This typically gets missed in conventional databases and analyses.

Extensive & expert data curation via **MedGraph EDGE** enhanced by AI & NLP helps clients access comprehensive annotated data insights from relevant databases coupled with domain expertise and an expert eye for curation, including but not limited to:

- SNPs, CNVs, InDels, translocations
- Cellular level data, epidemiological & molecular data from in vivo & in vitro experiments
- Gene regulation
- Post-translational protein modifications
- Cell behavior such as apoptosis, growth, motility and adhesion
- Protein-protein interactions
- Protein complex formation
- Cis/trans interacting domains

Biomedical landscape: AI for Better Data

NOVEL RESEARCH USECASES WITH BETTER DATA

Consumer Genomics/Ancestry
With millions of genotyped customers looking for analysis of their genomic data directly, fast & accurate curation is a MUST

Microbiome
Curation of human gut microbiome and cross-datasets (serological markers, food consumption data etc) for clinical markers

Decentralised Clinical Trials
DCT will be centre-stage with more improved data from wearables and biosensors curated accurately with speed stnd precision

Consumer Health
Individual health & nutrition support with data curated from sequencing coupled with ethnicity, age, education, biochemical parameters and more

CUTTING-EDGE AI FOR BETTER DATA AT SCALE

NER and Relationship Extraction → **Algorithm to identify relevant entities in unstructured text**

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Ambiguity Resolution → **Normalized with reference to ontologies**

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Semantic Contextual Enrichment → **AI models with LLMs to enrich relationships with contextual data**

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Causality Confidence Generation → **Identify causal relationships with directionality**