



CASCADE LangGraph MCP Server

LangGraph StateGraph Workflow

Initialize

Resolve Gene

Classify Role

Route

Batch Core
Perturbation | Regulators | Targets

Batch External
STRING PPI | LINCS | Super-Enh

Batch Insights
Similarity | Vulnerability | Cross-Cell

Generate Report

LLM Synthesis
(optional)

Core Tools
Network Propagation
Gene Embeddings
Similarity Cache
Gene ID Resolution

External Data
STRING DB
LINCS L1000
dbSUPER
Ensembl API

Data Assets
10 Regulatory Networks
GREmlN Checkpoint
Gene ID Cache

Sequential nodes

Conditional routing

Parallel batch execution

Report synthesis