

# Extracting and Sharing Knowledge with Semantics and Ontologies

Standards, definitions, and classifications of terms are extremely important for extracting and sharing knowledge in a reusable way. Ontologies have become a frequently used tool for terminology management across different industries and scientific domains. An ontology defines a set of concepts and the relations - or links - between them. Because ontologies follow very specific rules and formats, not every tool can read and process data that are stored in an ontology. With KNIME Analytics Platform, this is simple to do, while also combining the extracted data with other powerful functionality.



Ontologies, particularly in the life science domain, are very popular and often used for data integration, data curation, defining standards, data labeling, and more.

The reading and processing of ontologies can be automated with KNIME Analytics Platform. To do this, a data scientist creates a KNIME workflow that extracts terms and properties from a certain ontology, like in the example using ChEBI (Fig. 1), and applies this knowledge to different tasks ranging from domain exploration to data integration.

In this particular example, terms related to chemical compounds and their biological role are extracted, visualized, and embedded into a KNIME workflow that allows users to explore the content of the ontology. Once deployed via KNIME Server to the KNIME WebPortal, non-data scientists have access to an analytical application, which is easy to use and access. It exposes them to the right amount of detail – in this case domain knowledge stored in an ontology.

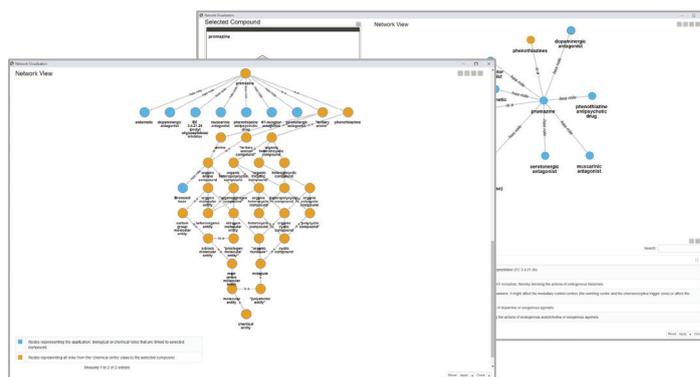


Fig. 1. Content of one particular endpoint of a chemical ontology (ChEBI) displayed in an interactive view in KNIME Analytics Platform.

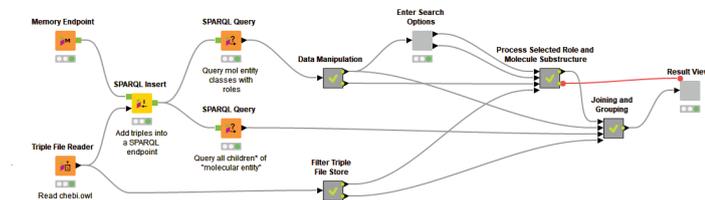


Fig. 2. KNIME workflow

## Results:

Because KNIME Analytics Platform can read and process ontologies, it enables users to:

- Automatically extract terms and classes
- Explore the content interactively
- Gain new information and generate hypotheses
- Standardize and integrate data from different sources

The open source KNIME Analytics Platform offers a variety of free extensions, which are simple to install. In this case, the KNIME Semantic Web/Linked Data Extensions enable data scientists to read and query file formats frequently used in the area of semantics and ontologies. And the KNIME Network Mining Extension creates network views in order to show the structure of an ontology.

