Use of Knowledge Graph for Clinical Multi-Omics Data Integration

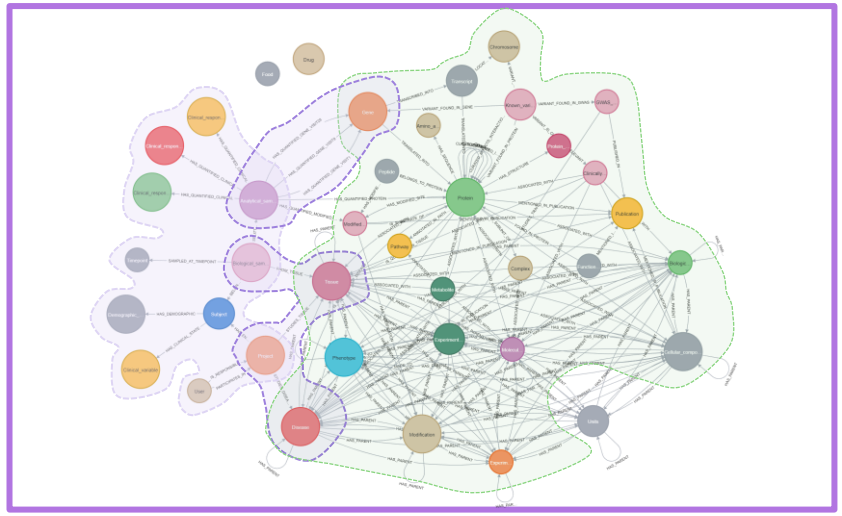
Knowledge Graph

Client Background and Objectives:

- Immunology Drug Discovery Unit within a top 20 Pharma company
- Client wanted to leverage a collection of multi-omics datasets from a clinical study in combination with public datasets from the same disease area.
- Client wanted to integrate all this information to gain insights into the mechanism of response to their drugs.

Key Business Needs:

- Understand molecular mechanisms of disease and resistance to therapy?
- Leverage the KG to train a model to predict patient's response to treatment?



Solution

- Knowledge graphs (KG) are flexible and scalable graph databases that allow ingestion, storage, management and analysis of interconnected data.
- Extend an open-source **patient-level knowledge graph** architecture to incorporate new data modalities .
- Populate the knowledge graph with structured data from **biomedical databases** (MetaBase™, Cortellis Drug Discovery Intelligence (CDDI)), ontologies and **client datasets** (clinical information, transcriptomics, proteomics, etc.).

Outcomes

- **A multi-team central repository for storing clinical datasets, including subject-level data,** connected to the broader biomedical knowledge reduces information redundancy and infrastructure burden.
- A **flexible and modular graph structure**, along with pre-defined analytical workflows, supports continuous expansion and timely insights, significantly reducing the time from idea to hypothesis validation.
- Graph architecture enabled a spectrum of analysis complexities, **from manual data exploration to Graph AI applications**

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