In the wake of the Industrial Revolution in Victorian Britain, a doctor drew a map to prove that cholera wasn't air-borne as it was believed at the time and became one of the fathers of modern epidemiology.

During a cholera outbreak in Soho in London in 1854, Dr. John Snow – Queen Victoria's anesthesiologist – created a map with the cholera deaths and identified a water pump as the common factor and the culprit for the deadly disease outbreak. He had the water pump handle removed and cases of cholera started to diminish.

Since that time, knowledge of diseases and how to prevent and treat them has grown enormously. More than 160 years later, researchers at Imperial College London used machine learning to create a digital 'food map' of hyper-foods containing cancer-beating molecules or such with anti-cancer potential.

> Our analysis underpins the design of next-generation cancer preventative and therapeutic nutrition strategies, the authors say in a study published in the Scientific Reports journal in July 2019.

Contemporary Pathways to Therapy Discovery

In 19th-century London, Dr. Snow roamed the streets of Soho to find the source of the cholera outbreak, link the deaths to the source and formulate new strategies for prevention and treatment. Today, researchers, scientists and medical experts are able to analyze enormous amounts of scientific literature published every day.

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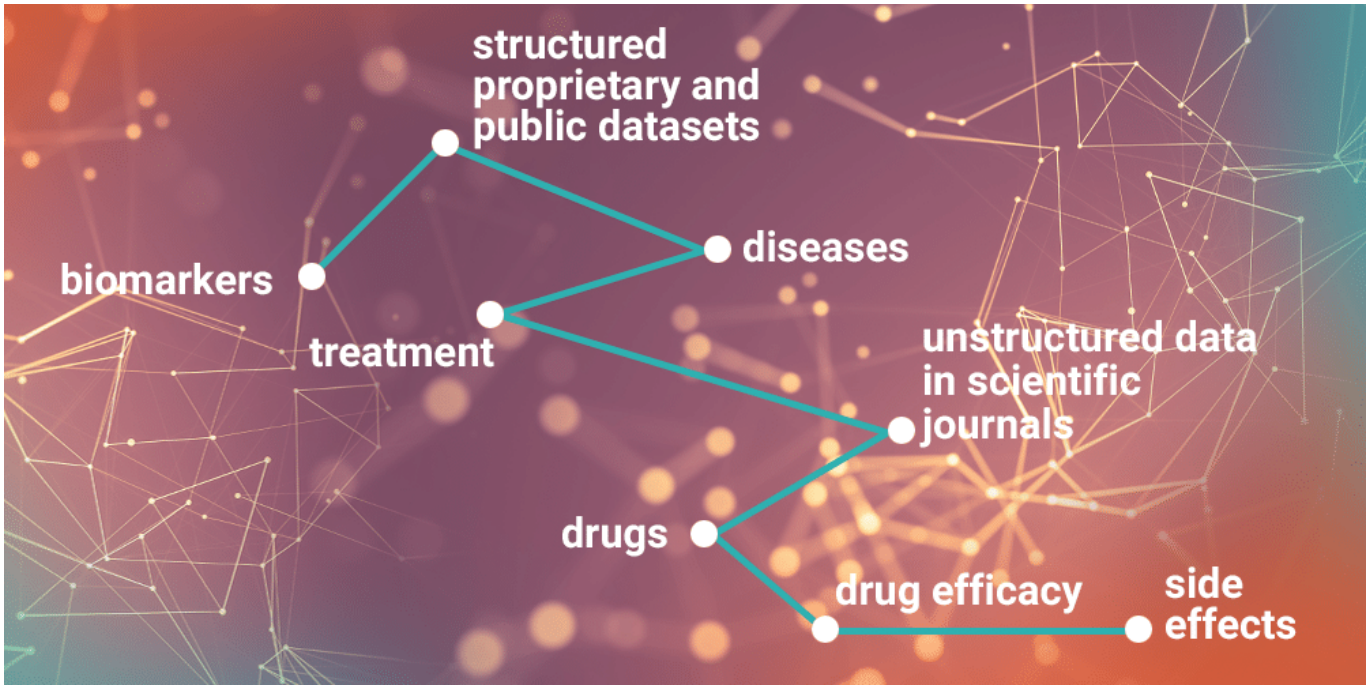

But while the exponential growth of information is a welcome development for medical research, analyzing these vast amounts of data is time-consuming and, often, inefficient. More importantly, it's difficult to uncover the relationships between diseases and drugs, biomarkers and treatment, drug efficacy and side effects, which are buried in the huge volumes of structured proprietary and public datasets as well as the unstructured data coming from scientific journals.

The Solution to the Data Challenge

This is where AI and semantic technology come to the rescue. They enable pharmaceutical and drug discovery companies to ingest their proprietary data and use it in the larger context of publicly available knowledge. The result is a dynamic knowledge graph with billions of statements describing concepts from major medical and pharmaceutical ontologies and vocabularies.

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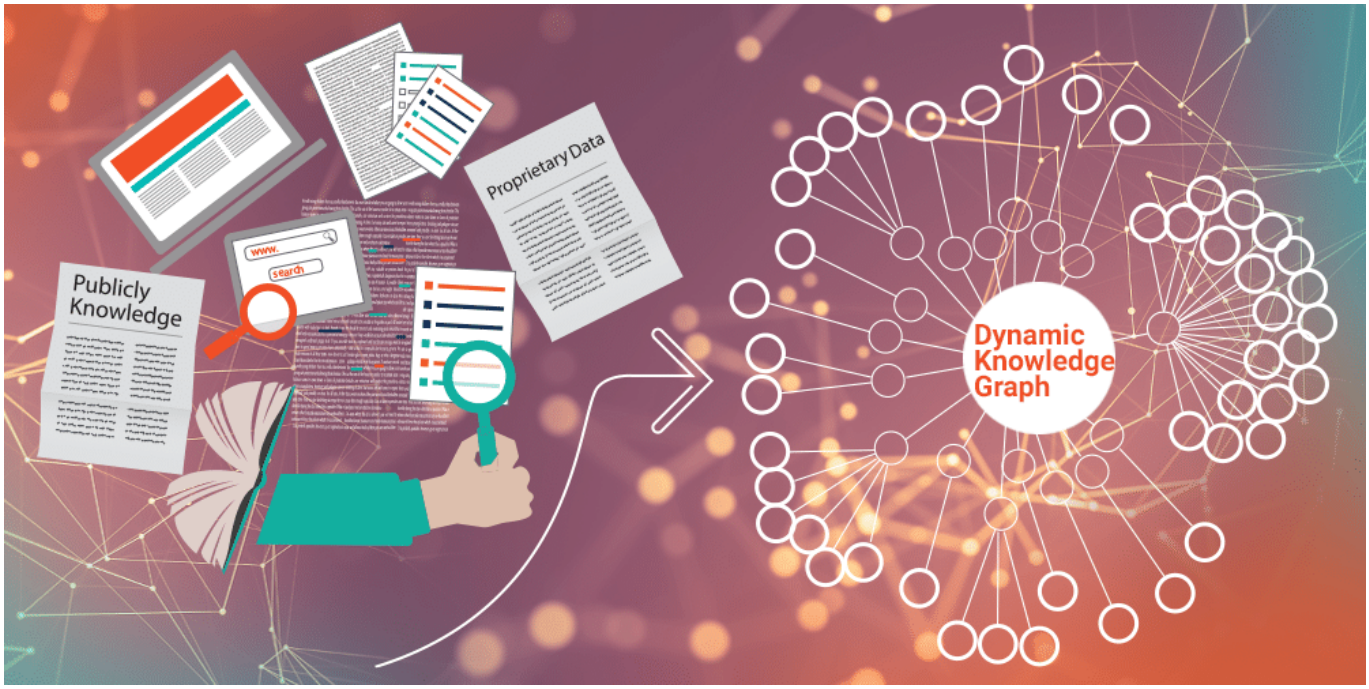

This knowledge graph can then serve as a reference for text analysis to identify relationships and concepts from scientific journals. The new data extracted from the journals is fed back to the graph, enriching the statements and expanding the relationships.

As a result, the pharma industry can now identify new patterns and discover previously unknown links between drugs and potential treatments.

Ontotext's Solution: an AI-Powered Knowledge Graph

As a cognitive and semantic technology company with years of experience, Ontotext has developed an AI-powered knowledge graph for NuMedii – a biopharmaceutical drug discovery company, which uses AI and Big Data to speed up the development of new medicinal drugs and therapies.

Thanks to Ontotext's expert solution, NuMedii can now access highly normalized and semantically interlinked data to discover hidden knowledge, identify correlations and test new hypotheses.

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Read our case study to see how semantic technology speeds up the discovery of novel therapies or discuss your particular use case with us.

Book a Discovery Call

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