The biopharmaceutical challenge

Efficient innovation

Highlights

- Watson helps scientists increase awareness within a scientific domain

- Watson helps improve understanding of relationships and enables exploration of new possibilities

- Watson can help clarify and validates hypothetical drug targets and the potential safety profile of new candidates

The 15-year 1.2 billion dollar per drug discovery investment is unsustainable[1]. To lead in research and ultimately the market, discovery needs to happen quickly and R&D efforts must be efficient.

The challenges for scientists and researchers

- Every year, thousands of scientific articles are published along with data generated internally. Researchers are challenged to keep up and leverage insights from the data.
- Scientific discovery requires understanding the relationships between elements in disease pathways and potential drug targets. Mapping those relationships is often a manual effort drawing from various data sources limiting the possibilities that scientists can explore.
- Once a hypothesis about a new target or relationship is formulated, manual data curation and review is often required to validate a new theory.
- When a candidate is identified, predicting its toxicity profile requires intensive evaluation and investment before it's known whether the compound can be used safely in patients.

Watson Discovery Advisor — accelerating breakthrough innovation

Watson brings the power of cognitive computing to life sciences, helping to accelerate the identification of new viable candidates while supporting efficient safety assessment to reduce waste in the research and discovery process.

How Watson accelerates insight

Watson harnesses big data

Watson draws from the internal and external scientific data, reading thousands of articles, tests, trials and molecular structures offering insights supported by easy to read evidence.

Watson identifies new relationships

Watson evaluates data and maps relationships between two, hundreds, or thousands of elements within a scientific domain (like gene relationships) or relationships across scientific domains (genes to disease or proteins to compounds) and offers an easy visual display of how elements of interest are related to others. Watson brings the evidence supporting each relationship right to the user's fingertips, pointing to the article, page and passage of supporting text.

Watson enables faster candidate evaluation

Watson can identify similarities between known drug candidates and ones under consideration, sifting through data to identify correlative information, which can help assess a candidate's toxicity profile. Watson can further drill down to identify potential patient sub populations that are most appropriate for a drug, and looks at the existing efficacy and safety information at a granular level to inform human trial design.

Questions that Watson can help answer

- What other genes might affect a gene known to activate a disease process?
- What other molecules have affected these proteins in the same way this existing compound has?
- How effective might a compound approved for this indication be in addressing drug targets in another therapeutic area?
- What is the existing toxicity profile for compounds similar to the one that is being evaluated, and what is the available evidence regarding the efficacy and safety in various patient sub-groups?

For more information

For more information about how IBM's Watson can transform your R&D efforts, contact your IBM sales representative or visit **ibm.com**/watson
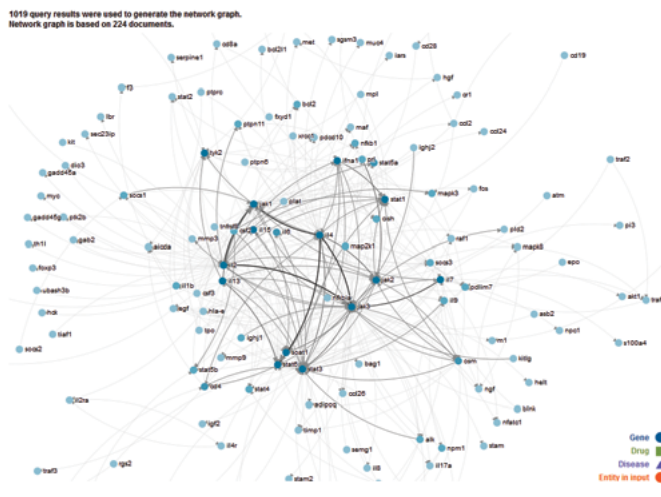

Figure 1: Knowledge Composition: Understand PROTEIN NETWORKS for P53

1 Pharmaceutical Research and Manufacturers of America, 2013 Biopharmaceutical Research Industry Profile, Washington, DC: PhRMA, July 2013

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