



Turbocharging research at the NIH

CHALLENGE

The NIH wanted to enable precision medicine by better understanding how genetic and other factors impact drug efficacy. But the **scale and intricacy of data** from High-Throughput Screening (HTS) robots, genome sequencers, mass spectrometers, and other instruments made it extremely challenging. Scientists had to painstakingly harmonize data from many sources, and informaticians had to do substantial pre-processing work on the data. Existing tools were originally developed with informaticians in mind, and their complexity prevented researchers from accessing, analyzing, and publishing their findings in a timely way.

SOLUTION

The NIH uses Foundry to integrate and harmonize scientific data from dozens of internal and external sources. Processing, normalizing, and analyzing this data in Foundry **allows new modes of** informatician / biologist collaboration via:

Direct connection to online and offline experiments

Online and offline experiments are ingested, processed, and normalized automatically. This enables biologists to view the results of their experiments and plan next steps. The data is joined with genomic data and open-source datasets for further analysis.

Data accessibility for researchers

Researchers independently analyze experimental data using **intuitive templates built by** informaticians. With the ability to link those results with past experiments and validate their conclusions, researchers can quickly understand how likely a compound is to become a successful drug candidate.

Traceability and privacy protections

Data provenance is fully traceable, allowing researchers to examine analytical conclusions. Granular access controls secure all data, ensuring the privacy and security of highly sensitive information.

IMPACT

- NIH researchers have **uncovered insights in hours** that used to require months of data gathering and manipulation.
- One lab predicted **novel drug combinations** for use in an oncology setting, which were then experimentally validated in vitro. In vivo follow up is currently underway for several of these combinations. If successful, this will lead to a clinical trial.
- A different lab validated a gene signature for drug response found in internal experiments. They compared observations from public genomic data with the findings from clinical data, increased their confidence in the initial finding, and defined precise experimental follow-ups.



Unifying patient data to personalize medicine

CHALLENGE

Siloed systems and data quality issues make it difficult for cancer centers to use data to improve patient outcomes. Patient records, such as diagnosis and treatment data, often come in unstructured physician notes and stem from multiple systems. These inconsistencies lead to duplicate patient records, and data issues prevent researchers from answering critical questions: What treatments are more effective for patients with a specific molecular mutation of low grade diffuse tumor? Are there specific drugs that work better than others in these cases?

SOLUTION

Integrated data asset to accelerate patient cohorting

This data asset includes electronic health records (EHRs), tumor registries, genomics panels, ICD-O, natural language processing (NLP) outputs, internal curated datasets, and molecular assay databases.

Accurate patient data to streamline analysis

With standardized disease patient records from across sources, researchers have consistent, accurate patient datasets. This means they can pull together cohorts of people with specific diagnoses and tumor variants for retrospective studies on patient and treatment outcomes.

Appropriate and secure data access

Fine-grained permissions allow data owners to make both PHI and obfuscated data available to different users depending on the individual needs.

IMPACT

- Researchers now identify patient cohorts in 30 minutes (versus weeks).
- Ongoing work is reducing the time it takes to collect data for a study from months to a few days.



Empowering smart, adaptive sales

CHALLENGE

A major pharmaceutical company wanted to gain market share in one of its product lines, but a fragmented data landscape limited its visibility into market dynamics. With no easy way to collect field data and improve their strategies, the sales force needed a technological edge to stay ahead of competition.

SOLUTION

Segmentation analysis to identify growth opportunities

With dozens of integrated datasets from internal and external sources, sales managers identify providers, patients, and regions with growth potential. For example, a sales manager can prioritize targeting high-volume prescribers of an adjacent product segment.

Bite-sized, actionable insights for sales reps

Insights based on the segmentation analysis are pushed to reps so they can use the most effective strategies to grow revenue.

Sales activity monitoring

Managers now have access to deep market dynamics across accounts, allowing them to test new approaches and implement portfolio strategies such as providing volume discounts.

IMPACT

- The entire organization – from leadership to field representatives – has visibility into an ever-changing market landscape.
- The sales organization has surfaced hundreds of new opportunities to gain market share.