BaseSpace® Cohort Analyzer for Analysis and Interpretation of Clinical Omics Data

Empowering translational research.

The BaseSpace Cohort Analyzer (Figure 1) enables translational research organizations to integrate and investigate complex patient data from public and private sources. It can be used for biomarker discovery, identification and selection of patient populations for clinical trial studies, and generation of individualized Omics data–driven reports. The BaseSpace Cohort Analyzer enables organizations to integrate internal data from clinical trials seamlessly and securely with collaborator and patient data from public sources. The BaseSpace Cohort Analyzer has been used at large pharmaceutical companies and translational research centers, successfully integrating tens of thousands of patient records with corresponding molecular and clinical data.

- Molecular and patient data from research studies are standardized, normalized, and imported for rigorous analysis.
- Simple and intuitive navigation provides seamless access to correlations between molecular and clinical data, enabling users to explore markers of interest across relevant patient cohorts (Figure 2).
- Intuitive queries can be used to select patient cohorts based on clinical, molecular, project-based, and study-based criteria.
- A simple interface enables one-click generation of analytical reports for one to thousands of patients.
- Graphs and charts summarize complex information in an intuitive and easy-to-understand format.

Figure 1: Primary Features of the BaseSpace Cohort Analyzer

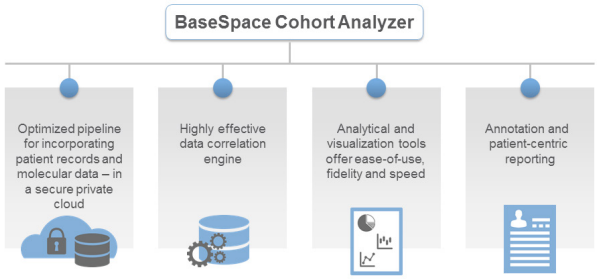

Figure 2: Data Exploration Across Patient Cohorts

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Aggregation of Complex Data into a Patient-Centric Record

The BaseSapce Cohort Analyzer integrates many types of clinical and molecular data into a patient-centric model. It includes data collected for a single patient over time, so that researchers can monitor patients, analyze clinical trial data, and gain a better understanding of disease progression. The integration of heterogeneous and temporal data in the BaseSpace Cohort Analyzer enables translational researchers to gain a more comprehensive view of the patient condition.

Individual Patient Analysis, Interpretation, and Reporting

With the BaseSpace Cohort Analyzer, researchers can analyze and interpret data at both the individual level and the patient cohort level. Individual patient analysis enables researchers to view clinical data and monitor patient treatment over time. Also, they can filter molecular data to identify biomarkers of interest and view reports identifying biologically or clinically significant biomarkers that were detected in the patient.

Patient Cohort Analysis and Dynamic Exploration

Researchers can use the flexible patient selection tool to define a patient cohort quickly by filtering patients based on clinical and molecular parameters. After a cohort is defined, researchers can access many informative metrics, such as biomarker frequencies and their correlation to survival. This Real-Time Analysis enables investigators to identify biologically important patterns quickly and discover novel driver mutations or putative prognostic markers easily. Also, groups of patients—such as responders and nonresponders—can be defined and analyzed to determine the differences in survival, molecular profiles, or clinical attributes.

Access to a Large Repository of Public Data Sets

Using the BaseSpace Analyzer ontology, public data sources such as The Cancer Genome Atlas (TCGA), International Cancer Genome Consortium (ICGC), Cancer Cell Line Encyclopedia (CCLE), Gene Expression Omnibus (GEO), and the database of Genotypes and Phenotypes (dbGaP) have been standardized and normalized so that they can be mined rigorously. BaseSpace Analyzer content is focused on disease-specific cohorts such as cancer, autoimmune diseases, cardiovascular disorders, diabetes, and rare genetic disorders to maximize the analytical capabilities of clinical studies. A cohort of healthy patients is also available for comparative analyses.

BaseSpace Correlation Engine for Biological Data Mining

Bringing big data and biology together.

The BaseSpace Correlation Engine supports all stages of the biological discovery process. The BaseSpace Engine provides life science researchers with unprecedented access to public molecular data and tools for making scientific decisions. These range from understanding the mechanisms of disease to characterizing the targets of a potential therapy (Figure 3). A constantly expanding library of genomic data enables researchers to identify billions of novel correlations (Figure 4), all through a simple graphical interface. Subscribers can upload proprietary data for integrated analysis, seamlessly share data across multiple geographic locations, and supplement internal knowledge bases with correlations and signatures derived from public data.

Gene Function

The BaseSpace Correlation Engine enables scientists to analyze gene function across more than 10,000 genomic studies in major disease areas and across many kinds of molecular data. This information can be used to understand gene activity across studies in humans, model organisms, and cell lines.

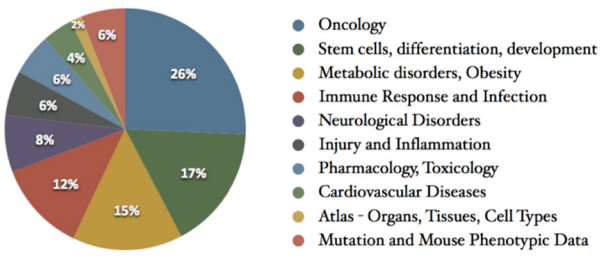
Mechanisms of Drug Action or Disease

With the BaseSpace Correlation Engine, researchers can analyze candidate molecules for pharmacokinetic and toxicity profiles and compare disease profiles across animal models, cohorts, and disease stages. The BaseSpace Engine enables users to assess the pathways that play significant roles in disease development across multiple studies and data types.

Cross-Species Analysis

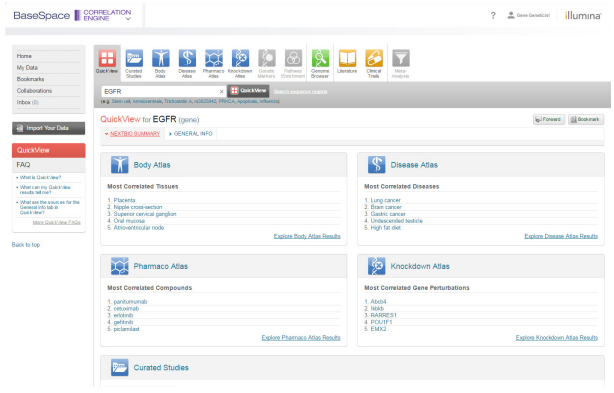
The BaseSpace Correlation Engine provides a cross-species analysis framework, enabling scientists to optimize experimental systems and test the mechanisms of disease progression or drug response. Researchers can compare human data to experimental results from model organisms and harness this information to derive biological context.

Figure 3: The BaseSpace Engine Provides Curated Studies by Disease Area



With over 15,000 curated studies and more than 100,000 molecular lists, the BaseSpace Correlation Engine is a constantly growing, data-driven platform for correlating experimental results with public data for target assessment, biomarker discovery, and drug repositioning.

Figure 4: The BaseSpace Engine Data Library Empowers Correlation Studies



The BaseSpace Correlation Engine captures genomic and other molecular data and compares them to tens of thousands of molecular signatures contained in public data sets. Novel correlations and associations can be identified automatically and summarized quickly.

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