



# ANVIL



COMMERCIAL VALUE FROM COMPLEX DATA

## **ANVIL EMPOWERS HEALTHCARE, PHARMACEUTICAL AND BIOTECHNOLOGY COMPANIES**

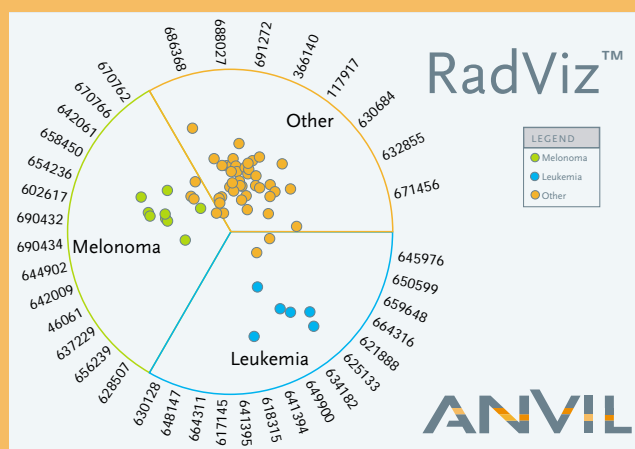
by offering knowledge gained through careful analysis of clinical, outcomes, chemical and genomics data. AnVil has the domain expertise and industry experience to extract valuable knowledge from these data, which are accessed through partnerships with life sciences companies.

Combining advanced data mining, integration and exploratory data analysis techniques with high dimensional visualization methods, AnVil is uniquely able to discover new and proprietary knowledge that is often obscured in the sheer volume and complexity of the data. The knowledge AnVil extracts leads to improvements in drug discovery and development, better patient care, and more efficient and effective delivery of healthcare services. It also produces new revenue streams for the collaborating companies that generate the data.

Through its access to and analysis of relevant healthcare and genomics data, and licensing of resulting intellectual property to pharmaceutical clients, AnVil is leading the industry toward realizing a vision of efficient, evidence-based, personalized medicine. This vision includes doctors determining how patients are likely to respond to certain drugs before prescribing them, and pharmaceutical companies having a clearer picture of which drugs will work best for specific patient groups and marketing them accordingly.



AnVil's proprietary RadViz™ technology reveals patterns in complex, life science data sets.



AnVil's high dimensional analysis and visualization reveal the compounds that are most effective in inhibiting growth of different cancer cell lines in this data set from the National Cancer Institute. The compounds are arranged around the perimeter in this Radical Visualization (RadViz), and the cancer cell lines are shown as colored dots within the large circle.

## COMMERCIAL COLLABORATIONS

AnVil collaborates with healthcare organizations, pharmaceutical benefit groups, clinics and other health-related entities to create partnerships and license intellectual property to pharmaceutical and biotechnology companies. This intellectual property is the knowledge, information and insights that AnVil extracts from its healthcare clients' large heterogeneous databases. These commercialization partnerships create new business opportunities for AnVil's partners. They also enable pharmaceutical and biotechnology companies to make better decisions, based on relevant healthcare information, and to improve the delivery of new and existing drugs.

## TEAM

AnVil's integrated teams of chemists, life scientists, medical doctors, biostatisticians, mathematicians, software engineers and informaticists not only mine data, but also generate and explore commercially relevant hypotheses, resulting in new, empowering knowledge. AnVil's methodology requires that informaticists and statisticians work closely with medical and life sciences experts in cross-functional teams. Such an approach provides a fruitful cross-fertilization of ideas and constructs. In addition, AnVil's business and marketing staff uses its extensive experience in technology transfer of intellectual property to market and license this knowledge to pharmaceutical and biotechnology clients.

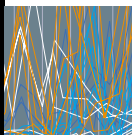
## TECHNOLOGY

AnVil combines data mining, statistical analysis and unique visualization methods to reveal new and commercially valuable information in large, complex data sets from its healthcare, biotechnology and health insurance clients. AnVil has also developed a proprietary data analysis platform with algorithms and tools that support the robust analysis of these types of data, as well as specific capabilities in disease identification and outcome measure definitions.

## DATA ACCESS

AnVil's collaboration partners provide access to a wealth of relevant healthcare data from diverse sources including medical and pharmaceutical claims, organ transplant registries, and surgery center, in-patient hospital and in-patient rehabilitation records. AnVil's partners also provide genomics and proteomics data derived from sources including microarrays, blood samples and tissue samples. Database and software experts from AnVil work with these partners to organize, clean and normalize multiple types of source data.

## DISCOVERY



AnVil is working with pharmaceutical, biotechnology, drug discovery, and healthcare companies to enable them to gain new and valuable knowledge from their complex data. AnVil's skilled informaticists work under the direction of medical and scientific domain specialists, applying advanced analytic techniques and technologies to extract insights and knowledge with significant commercial value to our clients. Client companies can also sponsor explorations into additional areas of interest in the data.

## PREDICTION



AnVil uncovered a gene set that predicts the success or failure of chemotherapy treatment for leukemia patients. This predictor set was used to create a disease and treatment outcome classifier for leukemia.

## IDENTIFICATION



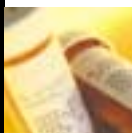
AnVil explored an extensive set of microarray gene expression data extracted from heterogeneous tissue samples to identify genes of potential pharmacological significance. From this data, AnVil prepared a 30-gene complex classifier that could differentiate normal tissue from two cancer subtypes with a very high degree of accuracy.

## INSIGHT



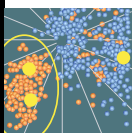
AnVil applied its analytical methodology and its pharmaceutical and clinical domain expertise to explore the effectiveness and efficacy of cardiac medications on stroke populations. AnVil also analyzed data from orthopedic treatments to assess the effectiveness of prescribed analgesics and anti-infectives. These analyses led to improvements in predictive and treatment models.

## UNDERSTANDING



AnVil helped a top-10 pharmaceutical company understand dose-dependent mechanisms of toxicity and efficacy in a lead compound, detecting a novel gender effect. This enabled the company to make informed decisions earlier in the drug development process — before human trials.

## ANALYSIS



AnVil enabled a client to achieve significant cost savings by predicting the toxicology of small molecules prior to synthesis and in vivo testing. AnVil also provided an analysis of the impact of each compound's individual structural features and feature combinations on predictive accuracy.

## DISTINCTION



AnVil combined chemistry and biochemistry domain expertise with proprietary high dimensional analysis and visualization techniques used by its expert informaticists to identify subsets of chemical structures (quinones) that appear to be significant in distinguishing several cancer classes from each other. This discovery has scientific significance as well as commercial potential as one step in the process of identifying potential pharmacophores for specific targets in different cancer classes.





## SPOTLIGHT ON HEALTHCARE

AnVil collaborates with healthcare organizations that collect and store vast amounts of clinical, outcomes, and claims data. Although these data often have enormous commercial potential to pharmaceutical companies, the real value is dependent on the extraction of meaningful knowledge from this data. It's the commercially relevant information and knowledge, not merely the data or even statistical summarizations of the data, that pharmaceutical companies seek in order to improve their drug discovery, development and marketing processes.

By applying its expertise to real-world data from collaborating healthcare providers, AnVil identifies valuable associations between demographic, therapeutic indications, pharmaceutical, and treatment outcome information.

This knowledge enables client pharmaceutical companies to bring drugs to market faster and helps avoid costly mistakes during clinical trials. In addition, AnVil provides discoveries that enable client companies to market drugs more effectively, make more informed sales forecasts, and through improved efficiency, justify the costs of their drugs.

Using proprietary algorithms for the accurate identification of disease, treatment and outcome in healthcare data sets, AnVil successfully uncovered significant relationships between therapeutic medication and therapeutic outcome in several infectious disease areas. These results have proven to be commercially valuable to major pharmaceutical organizations.

## COMMERCIAL VALUE FROM COMPLEX DATA

Recent advances in life sciences research and technology have led to an explosion in the volume of data available to drug makers and healthcare providers. However, data alone can't point a drug maker to the most promising avenue of research nor can it tell a therapeutics provider where to commit valuable technological and human resources.

Even organizations that have teams equipped with the latest data analysis tools are not finding the answers they seek, and are not creating revenue-generating solutions efficiently.

Many life science, drug discovery, and healthcare companies are looking to specialists — outside experts who can extract knowledge and generate commercially valuable results from complex data sets. AnVil, the preeminent commercialization partner to these organizations, provides the expertise to extract knowledge and generate results.

AnVil identifies and provides the best team of cross-disciplinary experts, the best methodology and the best technologies to help you forge the optimal discovery path.

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