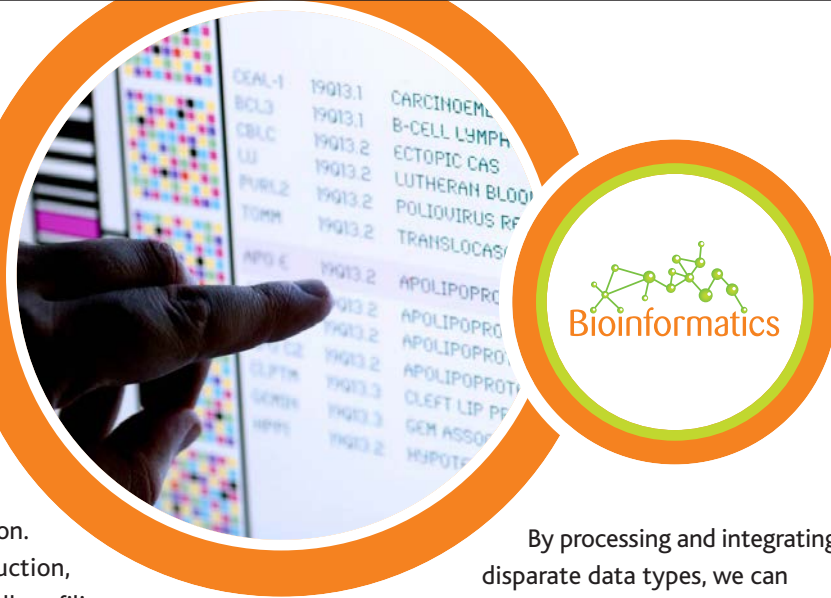


BIOINFORMATICS

Our Bioinformatics team can help answer scientific questions by analyzing your complex data. Whether you need a short-term boost in data analysis resources, or engage a specialized team for a long-term project, Rancho can support your requirements with projects including:

- Single cell transcriptomic analysis in R and Python. Routine analysis includes QC, dimensional reduction, clustering, and differential expression. In depth cell profiling with atlas-based cell annotation, trajectory inference, and RNA velocity.
- Processing and analysis of multimodal data. Gene expression, proteomics, and metabolomics differential expression/abundance.
- DNA or histone binding site analysis (ChIP-seq)
- Genetic variant detection (single nucleotide variants, insertions/deletions, copy number variants, genome structure variants)
- Association of genetic variants or gene expression profiles with disease, drug response, or clinical outcome
- Development of predictive models using machine learning or logistic regression
- Pathway analysis and functional enrichment analysis
- Phylogenetics and sequence analysis



By processing and integrating disparate data types, we can generate a comprehensive biological picture of a disease. This further informs practical biotech and pharmaceutical research and development, including applications in:

- **Precision Medicine:** Matching drug profiles and human genetic profiles, stratification of patient cohorts, biomarker identification
- **Drug discovery:** Mechanism of action studies, accelerating discovery pipelines, by intelligently screening results, pharmacology applications
- **Translational medicine:** Drug repositioning for new indications, companion, diagnostics, enabling cross-discipline communication

DATA ENGINEERING

Rancho combines deep scientific knowledge and technical expertise in software engineering to provide both custom and off-the-shelf solutions.

Engineering services include, but not limited to:

- Pipelines and process automation
- Data management and migration solutions
- Data integration
- Data visualizations
- Custom analytical tools
- FTEs to assist teams with software engineering needs
- Technical consulting



Rancho leverages its managed toolkit to customize solutions that meet client needs while cutting down on delivery time and cost.

Our mission is to exceed expectations by going beyond software to provide solutions that transform data into knowledge, enabling clients to solve problems and better serve their customers.



Explore Rancho Biosciences Services

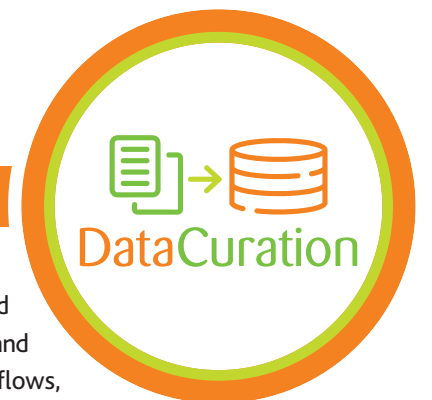
Rancho BioSciences provides data curation services for Pharmaceutical and Biotech companies, as well as for Academic institutions, Foundations and Government. Rancho works with different life science data types including clinical trial, genomic, gene variant, assay, chemistry, microbiome, flow cytometry and imaging data. The data can be internal and/or public. Rancho BioSciences is platform-agnostic and has a lot of experience formatting data for many commercial, internal, and public (open-source) platforms.



DATA CURATION SERVICES

- Data harmonization
- Application of F.A.I.R. principles
- Data cataloging
- Ontology and data dictionary services
- Data models for research domains, databases, etc
- Data mapping

The Rancho BioSciences team has robust and reproducible automated and manual curation workflows, which include application of controlled vocabularies from scientific ontologies and dictionaries and data models, such as CDISC, MeSH, MedDRA and SNOMED.



KNOWLEDGE MINING

Rancho BioSciences Ph.D. and M.D. scientists excel at knowledge mining that includes:

- Searching for datasets with specific attributes
- Target profile reports
- Building Natural Language Processing (NLP) pipelines and creating training datasets for NLP
- Building disease, genetic variant, microbiome, and drug knowledge bases
- Annotation of publications: interactions, assays, drug activity and toxicity, clinical trials, etc
- Literature search based on customer needs
- Search of Principal Investigators and grants for a research area of interest

LEVERAGE THE FULL POWER OF YOUR DATA

Whether your focus is drug discovery, diagnostic tests, or foundational research, your company's value hinges on your ability to effectively leverage all available data. Too often, data is isolated by virtue of living on different systems, existing in non-standard formats, or lacking necessary curation. Fixing this problem requires a detailed understanding of both the data itself and the data science techniques required for downstream analysis. Rancho's experienced team of PhD

scientists has both. We can help you integrate your data, mine it to gain insights, and realize its full potential.

Before writing a single line of code, we will meet with you to understand your needs. Our scientists will design a fit-for-purpose solution that may involve custom, open source, and commercial components.

Quality control is built into our workflows to ensure that we deliver a robust solution to you. We will wrap up the project by presenting our findings and sharing all associated code along with complete documentation. We are also available to provide training on new tools or long-term project support.

The Rancho Data Science team can help you with:

- **FAIR**ification of large datasets to ensure data from disparate sources and formats is Findable, Accessible, Interoperable, and Reusable
- Interactive data visualization, including R-shiny, to help you explore your data and make hypotheses
- Python, R, and other scripting needs
- Machine learning
- Statistical analysis



DATA MANAGEMENT

- Data management

is an IT practice encompassing an organization's practices across the data life cycle

- Data governance

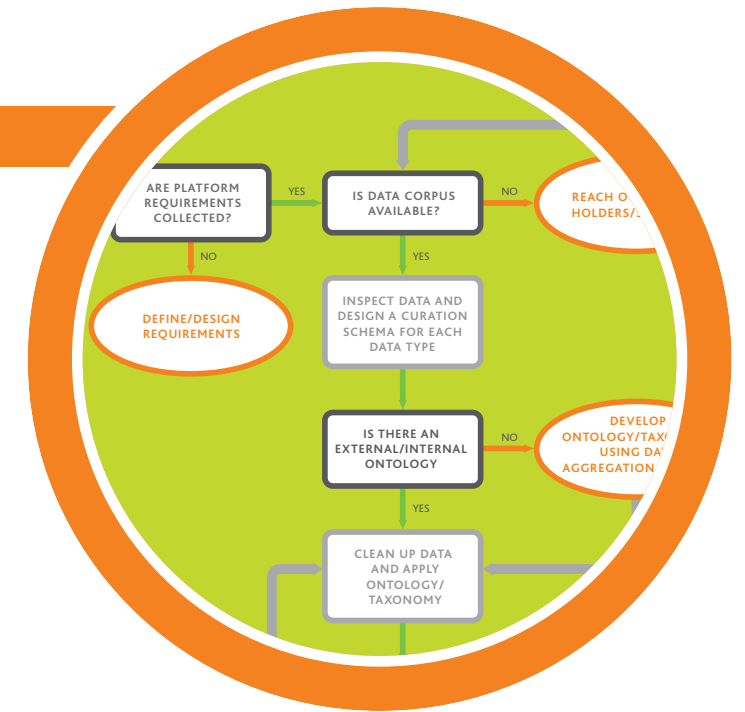
is a business practice that defines how data is processed across the organization to ensure that data is FAIR (compliant, private etc)

- Data modeling

is a process of creating conceptual, logical, or physical data models for one's data

Life Sciences companies accumulate data with ever-increasing pace, and data that they use to create new treatments or new diagnostics is more diverse and complex than in arguably any other domains. With multiple data sources, data elements, stakeholders, and data consumers it gets progressively harder and harder to scale and to maintain control over data life cycle. There is a strong awareness in the scientific community that more data must produce more insight and knowledge, but this goal has been difficult to attain. Life Sciences businesses are now relying on the practice of data management and data governance as best business practice to wrangle data assets and realize value from data.

There are many resources that deliver data management and data governance solutions. There are frameworks, platforms, and solutions; there are tools that one can use and knowledge bases to consult with. **We are different.** We provide people – scientists with subject matter expertise trained in data modeling – who can help. Our people have dozens of years of experience in their respective field of study and participated in multiple projects where they did data modeling or provided data governance support. We have real-life experience, and we can support your projects with minimal ramp-up time leveraging data models we have already built and know how.



WHAT CAN BE DELIVERED?

- **Data Models:** delivered as ERDs, in many cases with data dictionaries. We use a variety of tools to deliver data models, LucidCharts and ER studio by IDERA being most common

- **Data governance as a process:** we provide scientists trained in data modeling and experienced with data governance projects to support your team operationally. We bridge scientists and IT departments and provide oversight on the data governance process at your organization. We develop community outreach to educate your team on best practices. We write SOPs, post them, and check that people adhere to the recommendations

Documentation, strategy documents, investigation of third-party tools: we help clients develop short and long data strategy. Often, young companies focus on research and work hard to develop a new drug or a diagnostic – and find themselves in need to quickly become ready for a regulatory finding, but they lack skillset in-house to approach this stage of growth. Rancho team can evaluate current state and find solutions for future data state 0 - tailored to specific needs of the client. We do not own software or platforms and will provide our opinions based on our experience and expertise to help clients select the best solution for their situation.

