VELSERA

The Precision Engine Company

Seven Bridges Platform.

DRIVING THE ENTIRE DRUG DISCOVERY CYCLE

Accelerate your drug discovery process with Velsera's enterprise-grade bioinformatics ecosystem, for streamlined target identification and hypothesis validation, in-depth analysis of clinical trial data, and scientifically-grounded insights across therapeutic areas.

Insights and expertise are siloed across therapeutic areas

Ensure collaborative research across teams on a unified bioinformatics suite, standardizing data and workflow access.

Lead identification is costly and time consuming

Maximize the yield and timeliness of candidate markers, hypotheses, and clinically relevant insights.

Proprietary and public datasets are not readily actionable

Data ingestion, standardization, engineering and federation ensure disparate and heterogeneous sources are ready to go.

Insights from trial and cohort data remain hidden

Expert help and mature tools for data exploration, hypothesis generation, and candidate validation.

Trial Probability of Success (PoS) is at risk without immediate insights

De-risk clinical trials by assessing data quality and deriving insights early.

VELSERA

Seven Bridges Platform

A foundation for tomorrow's discoveries.

Bring together data from anywhere in the world ...

Enabling collaborative Research & Development

Access to public, federated datasets, including NIH

Access to a team of experts and professional services

... draw on extensive biomedical and bioinformatics expertise ...

8/10
top tier pharma customers

470+
references in peer-reviewed publications

25,000+
research and scientific users across academic, public, and commercial platforms

180+
scientific and bioinformatics experts partnering to provide on-demand, tailored support

1M+
patients covered in multi-omic, petabyte scale data sets

30+
government projects and academic consortia supporting global health science, research and discovery

... to accelerate drug discovery

CASE STUDY

Challenge

A top 10 pharma company required a scalable solution capable of supporting its drug development life cycle from early discovery to regulatory approval

Solution

- Standardizing analysis by creating fully automated solutions that streamline results generation and minimize error-prone manual steps
- Co-developing state-of-the-art analysis methods and tools to drive the drug discovery pipeline
- Collaborating with biopharma's regulatory teams to support clinical trials around the world

Results

550%
increase of standardized sample processing capacity in 3 years

5x
lower cost for complex analyses such as whole-exome or RNA-seq

2.5x
faster completion time for whole-genome analysis, accelerating clinical trials

ENABLING COLLABORATIVE RESEARCH & DEVELOPMENT

Supporting data federation and collaborative R&D.

An enterprise-grade platform ...

Public Apps Gallery

Access close to 1000 ready-to-use optimized CWL and Nextflow tools and workflows that also can be incorporated into custom pipelines

Connected cloud

Keep data in your own buckets with storage support for AWS, Azure, and Google Cloud Platform

Industry-standard tools for reproducibility and compliance

Build, customize, automate, and execute analysis pipelines using established tools, APIs & CLI in secure, compliant & regulated ISO and FedRAMP environments

Transparent and efficient cost model

Save 70–90% on cloud compute costs using spot/ preemptible instances

... providing the flexibility and compatibility you need ...

Multi-cloud

Analyze data where it resides by selecting from multiple cloud vendors and regions

Workflow Orchestration

Write, customize and execute your workflows in your preferred workflow language, whether in CWL, Nextflow or WDL

Ease of pipeline migration

Easily bring your existing tools and workflows in and out of the Platform

Workflow editor for customization

Utilize the drag-and-drop interface to build and customize new pipelines without the necessity of writing a single line of code

... and enabling the right collaboration for the right outcomes

Collaborative Research & Development

Collaborate within and across organizations while maintaining control over your assets through fine-grain permission levels in real-time

De-siloed data management

Out-of-the-box capabilities and extensive metadata infrastructure to handle large data and unlock disparate data sets

Experienced Professional Services team

Our experienced services team provides the end-to-end support you need to manage your multi-omic and phenotypic data ecosystem

ACCESS TO PUBLIC, FEDERATED DATASETS, INCLUDING NIH

Seamlessly access large federated datasets...

Petabytes of multi-modal public data spanning multiple biomedical sources enable analysis in concert with your proprietary data. Velsera partners with a wide range of public organizations to facilitate dataset access. As the exclusive commercial "NIH Trusted Partner," our users derive unparalleled value from NIH datasets.

CPTAC · TARGET · Pacific Pediatric Neuro-Oncology Consortium · ALLIANCE of GENOME RESOURCES · CBTTC Children's Brain Tumor Tissue Consortium · CANCER IMAGING ARCHIVE · PCAWG PanCancer Analysis of WHOLE GENOMES · TCGA · Personal Genome Project · ICGC · Gabriella Miller Kids First Pediatric Research Program · CCLE Cancer Cell Line Encyclopedia · SIMONS FOUNDATION

...and many more through standards: Global Alliance for Genomics & Health — Collaborate. Innovate. Accelerate.

... in a secure and compliant environment.

Velsera designs, develops, and maintains solutions that meet industry-standard security requirements and compliance certifications.

HIPAA Compliance

The Seven Bridges Platform supports the strict compliance with the Health Insurance Portability and Accountability Act (HIPAA), to ensure compliance with regulatory obligations and adherence to the highest standards of privacy and security protection.

Information Security Certification

Velsera maintains numerous information security and privacy certificates to ensure all established internal controls are operating effectively and efficiently to provide the highest level of security and privacy protection: ISO 27001, ISO 27017, ISO 27018, ISO 27701, ISO 9001.

Data Privacy and Protection

Velsera implements the best security and privacy controls across the organization, by maintaining the robust Information Security and Data Privacy program, based on applicable standards, regulations and guidelines, such as ISO, NIST, CIS, CSA, GDPR etc.

GxP on the Cloud

The Seven Bridges Platform leverages AWS as an IaaS provider, following all industry standards. Details regarding AWS and GxP are available here:

https://aws.amazon.com/compliance/gxp-part-11-annex-11/

ACCESS TO A TEAM OF EXPERTS AND PROFESSIONAL SERVICES

Collaborate with our experienced services team across the entire drug discovery journey.

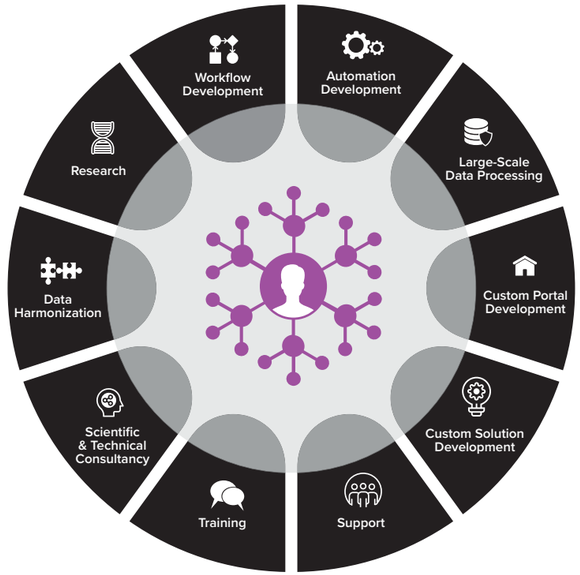
Achievements

300+ completed projects

500+ customer requests fulfilled

100K+ work hours to date

With on-demand professional and consultative services from a team of 150+ biologists, geneticists, engineers, statisticians, project managers, and bioinformatics scientists at Velsera, you can gain a strategic partner for your research efforts – from drug discovery and clinical trial optimization to basic research – across all next-generation sequencing (NGS) and other biomedical data analysis applications, enabling new discovery.



AREAS OF EXPERTISE

- RNA-Seq, Single Cell and Spatial Transcriptomics Analyses
- Whole-Genome & Whole-Exome Analysis
- Epigenetics & Chromatin Modifications
- Immuno-Oncology
- Machine Learning
- Population Analysis & Biomarker Discovery
- Proteomics
- Variant Identification & Annotation
- Medical Image Processing
- Metagenomics and Microbiology
- Workflow Benchmarking & Optimizations
- Data Engineering & Model Definition
- Data Harmonization
- Multi-Dimensional Data Integration

Velsera supports your entire drug discovery cycle … … with a comprehensive data & analytics ecosystem.

DRUG DISCOVERY CYCLE	EXAMPLES OF SEVEN BRIDGES PLATFORM VALUE ADDED	TIME REQUIRED WITH IN-HOUSE SOLUTIONS	QUANTIFIED IMPACT VS. IN-HOUSE SOLUTIONS		
			Time savings	Cost savings	Improved quality of outputs
1 TARGET ID AND VALIDATION	▪ Facilitate normalization, integration, QC, and preparation of public datasets, e.g., TCGA, ICGC, CPTAC[1], and integrate with your proprietary data ▪ Perform explorative data analysis on integrated proprietary and public data sets to identify key receptors, particular pathways, effective enzymes, etc. ▪ Facilitate target discovery/validation in human population studies (e.g., genome-wide association studies, transcriptomics) and population 'omics-based biomarkers ▪ Perform liability studies to reduce later stage failure	6–36 MONTHS	30–50%	3–25%	30–50% IMPROVED ACCURACY 200% IMPROVED PRECISION
2 LEAD ID AND OPTIMIZATION	▪ Validate pathways using multi-omics to better understand the potential of different pathways and what a successful compound could look like ▪ Identify surrogate biomarkers to evaluate compound impact ▪ Optimize biologics/cell and gene therapy products for efficacy and toxicity ▪ Facilitate biologic validation				
3 PRECLINICAL TRANSLATION	▪ Conduct NGS and multi-omics analyses to identify off-target sites and improve off-target safety for cell and gene therapy ▪ Validate the efficacy and safety of compounds in disease model settings ▪ Enable better understanding of the effects of different dosages	8–18 MONTHS	10–50%	15–50%	10–30% IMPROVED ACCURACY 15% IMPROVED PRECISION
4 CLINICAL TRIALS[2]	▪ Standardize and scale genomic sequencing ▪ Facilitate biomarker discovery associated with drug responses ▪ Stratify patient populations using a multi-omics based approach	1–2 YEARS FOR PHASE I 2–3 YEARS FOR PHASE II	20% IN PHASE I	10% IN PHASE II	25% IMPROVED ACCURACY 50% IMPROVED PRECISION

Source: Customer interviews.

1. The Cancer Genome Atlas, International Cancer Genome Consortium, Clinical Proteomic Tumor Analysis Consortium.
2. Impact for clinical trials is estimated when using Seven Bridges Platform in combination with bioinformatics platforms that provide access to proprietary data.

VELSERA

Seven Bridges Platform

Efficiency and time-to-value in drug discovery.

Value delivered	with Velsera and the Seven Bridges Platform
Lower processing costs	▪ Reduces AWS spending by **~80%** by running on the Seven Bridges Platform ▪ Reduces experiment repetition through optimal data sequencing, saving time and money
Faster critical insights	▪ Reduces query times from 12 hours to one minute **(700x faster)** ▪ Increases standardized sample processing capacity by **~550%** in three years ▪ Completes whole-genome analysis **2.5x** faster, accelerating clinical trials
Higher-quality output	▪ Increases production-grade analysis run by bench scientists from ~30% to >90% in four years **(3x higher)**

Source: Seven Bridges Platform customer use cases.

CASE STUDY

Accelerating drug discovery with AI/ML for cancer cell models

Challenge

A biotech startup lacked the internal expertise to develop *in silico* methods for cancer cell line response prediction

Resource constraints and need to supplement their clinical development pipeline in a partnership to advance their research

Solution

- A milestone-based project with cancer cell models grounded in science and data
- Delivered a Machine Learning (ML) model to predict drug class susceptibility
- Model allows the organization to identify relevant candidates for in vitro/in vivo and ex vivo assays

Results

12+ months
of internal development time saved through co-development

Launch
and deployment of a trained & validated ML model on enterprise-grade infrastructure

New biomarker
identified that will allow for better detection of susceptible cells

Leading public organizations choose Velsera.

Precision medicine and public programs funded by the NCI, NHLBI, PanCAN and more, leverage Seven Bridges infrastructure to deliver customized, interoperable ecosystems in support of large-scale research projects.

Uncover new insights into cancer

CANCER GENOMICS CLOUD SEVEN BRIDGES

The Seven Bridges Cancer Genomics Cloud (CGC), powered by Velsera and funded by the NCI, is a flexible cloud platform that enables analysis, storage, and computation of large cancer datasets. The CGC provides a user-friendly portal to access and analyze cancer data where it lives. With the CGC, any user with an account can easily access petabytes of cancer data, share it, analyze and use the computational power of the cloud.

Accelerate pediatric research discovery

CAVATICA

CAVATICA was co-developed by Velsera (formerly Seven Bridges) and the Center for Data Driven Discovery in Biomedicine at the Children's Hospital of Philadelphia. Today, CAVATICA supports multiple data ecosystems including the Gabriella Miller Kids First Program, the INCLUDE Project, and consortia like the Rare Disease Clinical Research Network.

Access leading heart, lung, blood & sleep data

NIH National Heart, Lung, and Blood Institute | BioData CATALYST Powered by Seven Bridges

The NIH National Heart, Lung, and Blood Institute runs the NHLBI BioData Catalyst® to develop an advanced cyberinfrastructure to democratize data and computational access to decades of pre-clinical and clinical data and research on heart, lung, blood, sleep, genomic and other omics data. Velsera drives the NHLBI BioData Catalyst, a cloud-based data analysis workspace environment.

Expand pancreatic research with data sharing

PANCREATIC CANCER ACTION NETWORK

SPARK® is a health data integration cloud platform funded by the Pancreatic Cancer Action Network (PanCAN) that gives qualified researchers secure and open access to de-identified pancreatic patient data (including the Know Your Tumor and the Precision Promise datasets). The SPARK® platform enables cohort creation across clinical features and empowers users to rapidly analyze data, derive insights and publish results.

Use PDX models in personalized medicine research

PDX Net

The Patient-Derived Xenograft (PDX) Development and Trial Centers (PDTC) research network consortium was funded by the National Cancer Institute (NCI) to accelerate PDX research. By developing new models across cancer types, PDX models identify new multi-agent treatments to bring forward into clinical trials, through generating complementary RNA-Seq and whole-exome sequencing data and increasing ethnic diversity.

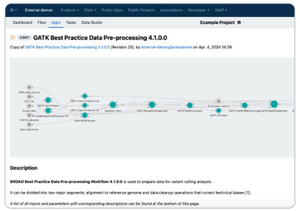
Aggregate diverse data types from NCI-funded programs

Cancer Data Aggregator

The Cancer Data Aggregator (CDA) is being developed to allow researchers to aggregate diverse data types generated by programs funded by the NCI, such as the Human Tumor Cell Atlas Network (HTAN) and the Clinical Proteomic Tumor Analysis Consortium (CPTAC) that is hosted by the NCI Cancer Research Data Commons.

Expert data analysis through a suite of connected omics power tools...

WORKFLOW MANAGEMENT

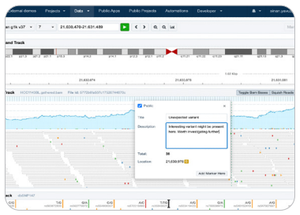


Leverage the drag-and-drop interface to build and customize new pipelines with access to close to 1000 ready-to-use optimized tools and workflows

RHEO™

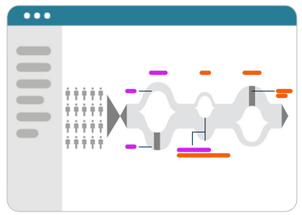
Automate and streamline your analysis to derive insights faster, removing manual steps and ensuring reproducibility

INTERACTIVE BROWSERS



Explore data interactively with custom report views or a Genome Browser

GRAF™



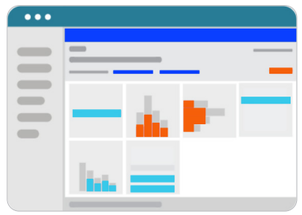
Pangenotype-based NGS alignment and calling with best-in-class accuracy, cost, and ease of use

DATA STUDIO

jupyter sas RStudio

Derive new insights using interactive JupyterLab, RStudio, and SAS Studio custom environments

ARIA™



Analyze clinical and omics cohort data for interactive, visual discovery

CUSTOM WEBAPPS

Flask Shiny Dash

and others...

Create custom interfaces, figures, or reports that are easily digestible and shareable

SEAM

A centralized interface to make data assets discoverable within your organization

... across any data modality for actionable drug discovery insights.

- **Genomics**
- **Transcriptomics**
- **Epigenomics**
- **Proteomics**
- **Metabolomics**
- **Imaging**
- **GWAS/pheWAS**
- **EHR/RWE**
- **Targeted assays**
- **Single-cell**

AND MANY MORE...

VELSERA

The Precision Engine Company

Build on Velsera's expert team, software platform and knowledge bases to enable precision medicine across diagnostics and discovery.

Velsera's full solution portfolio offers omics analysis and interpretation, actionable diagnostic reporting, lab workflow orchestration and QC, reimbursement expertise, and more.

Knowledge.

We curate the world's genetic knowledge, bringing together relevant genetic data, treatment plans, clinical trials, therapies, and drug information from around the world.

Interpretation.

Our advanced interpretation technology makes intelligent associations between this comprehensive dataset and individual patient results.

Insights.

With our easy-to-understand reporting and actionable insights, clinicians achieve a higher level of precision and a deeper understanding of how to diagnose and treat diseases.

Workflow.

Sample flow orchestration and full track & trace in a routine diagnostic setting. With tools to standardize and automate routine the sample to result flow across labs, instruments, assays, and clinical applications.

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To learn more about Velsera and other features of the Seven Bridges Platform.

VELSERA

Seven Bridges Platform

"Pfizer wanted a solution that was sustainable, flexible, and customizable for our single-cell RNA-seq use case.

Velsera opens the door for a more efficient way to perform collaborative research and participate in consortia."[1]

ENOCH HUANG VICE PRESIDENT OF INTEGRATIVE BIOLOGY AND MEDICINAL SCIENCES, PFIZER R&D

1 https://www.genomeweb.com/informatics/pfizer-centralizes-rna-seq-data-seven-bridges-under-integrative-biology-program

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Contact us to learn more about the Seven Bridges Platform, discuss your research goals or book a demo to see how Velsera drives research and discovery from insight to impact!

SCHRAFFT'S CITY CENTER, 529 MAIN ST
SUITE 6610, CHARLESTOWN, MA 02129