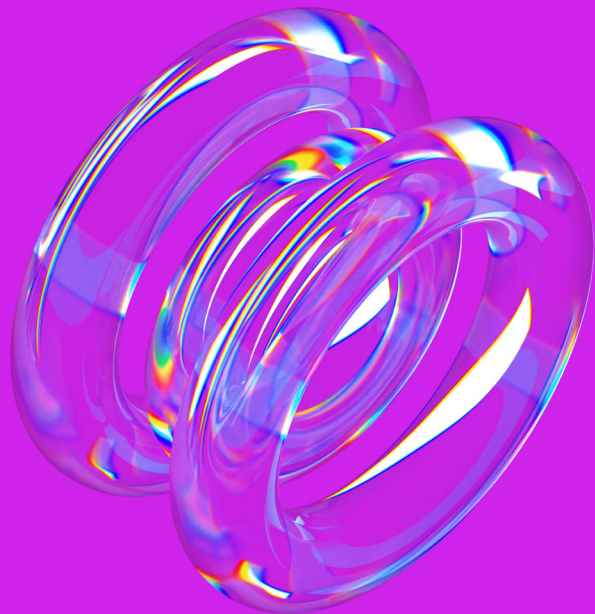# VELSERA

ARIA

Today's Science Tomorrow's Medicine

Accelerate Speed to Insight

Realize the Million Genome Era

Get Connected

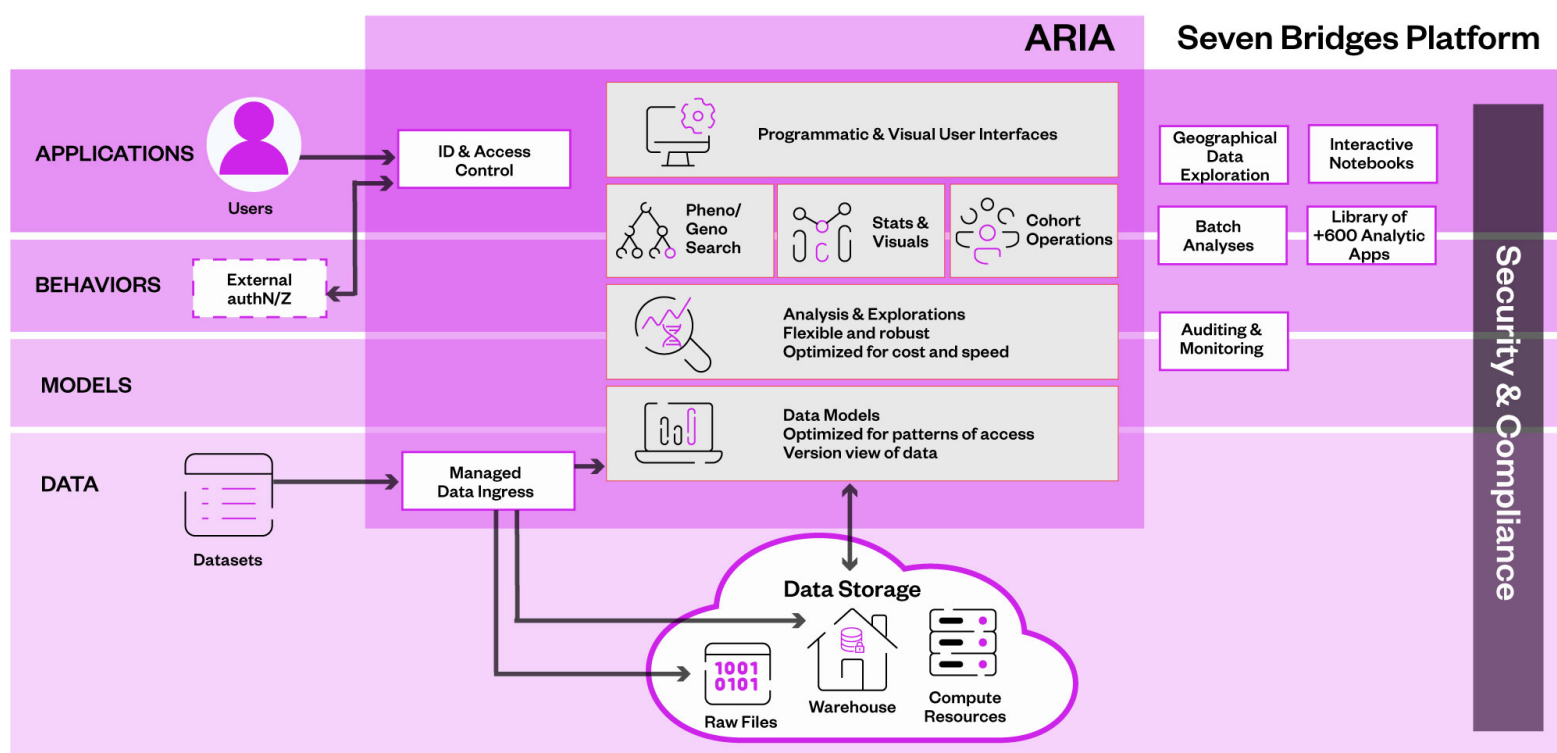# Robust Analysis on Integrated Genomic & Phenotypic Data

Across the world, numerous initiatives are currently underway to collect massive repositories of genomic and phenotypic data. These data have the potential to reveal transformative insights into the underpinnings of disease, unlocking novel therapeutic approaches and *in silico* disease models.

Seven Bridges ARIA offers researchers a centralized solution for high throughput molecular and health data analysis across datasets. Our solution enables users to manage and create cohorts and execute complex statistical analyses of their choosing, all within a connected and secure ecosystem.

Velsera ARIA

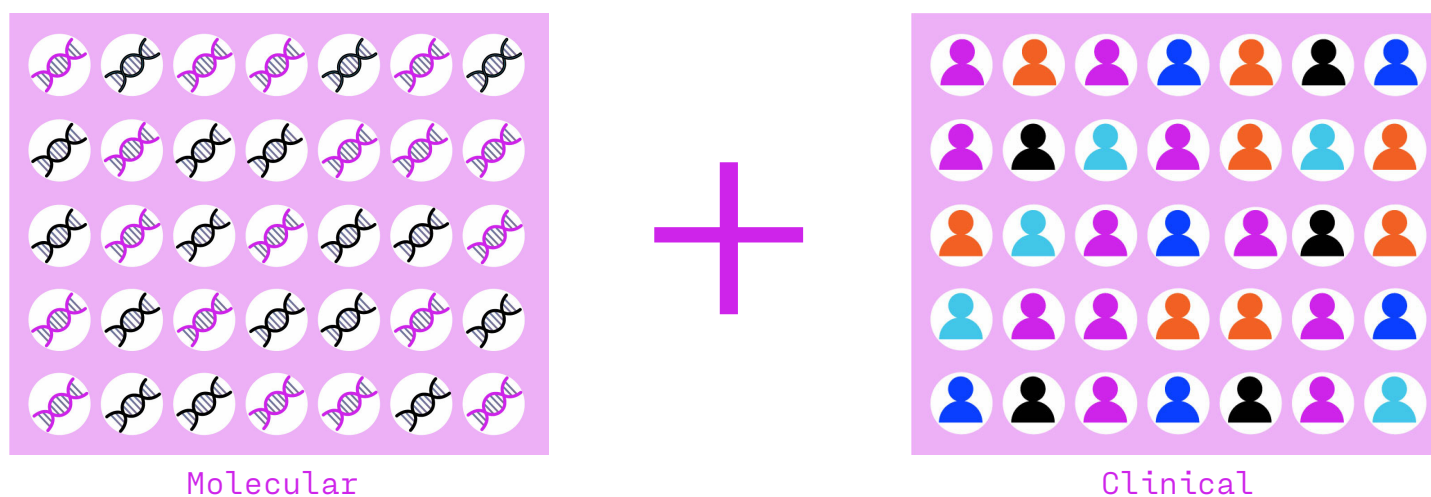### Centralized solution for genomic and phenotypic analysis

Building on the Velsera Seven Bridges Platform, ARIA provides users the ability to extend insights for downstream analyses. The Platform is a web-based ecosystem for collaborative cloud computing that provides users with over 700 tools and workflows to conduct analyses from NGS processing to GWAS and beyond.

ARIA layers on top of the Seven Bridges Platform
to create a powerful end-to-end experience.

VELSERA

Accelerate Speed to Insight

Iterative data ingestion and the ability to use familiar interfaces enables researchers to draw insights from data within weeks
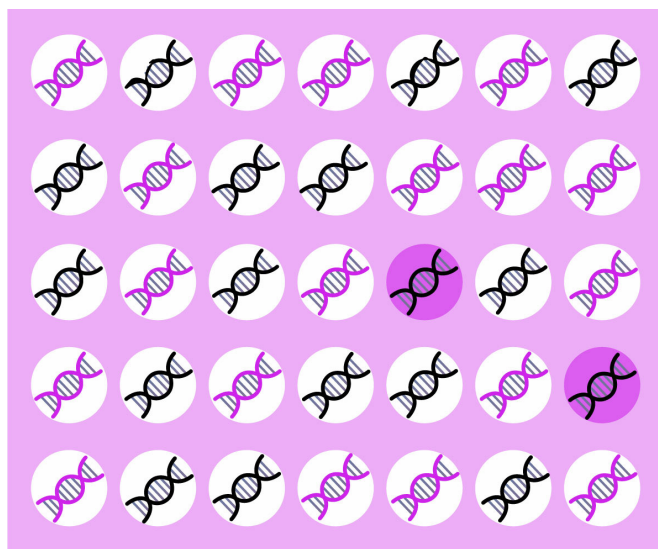

Molecular

+

Clinical

Complete Solution for Combining Genomics & Health Data

- Expedite time to value through rapid iterative exploration of data fields.

- Phenotype information is stored in a flexible and dynamic manner, allowing rapid exploration and selection of cohorts based on complex, compound variables, and records leveraging longitudinal data.

- Schema standardization lays the groundwork for interoperability of genomic and clinical data housed in diverse geographical regions or between multiple entities.

- Programmatic and configurable out-of-the-box visual interfaces enable researchers with diverse backgrounds to maximize utility of data from feasibility study through association and downstream analyses.

- Robust Software Development Kit (SDK) to create analytical tools, workflows, and interactive exploration including JupyterLab and RStudio provides users complete control over downstream statistical analysis.

VELSERA

Realize the Million Genome Era

Unparalleled ability to query, store, and analyze rich phenotypic
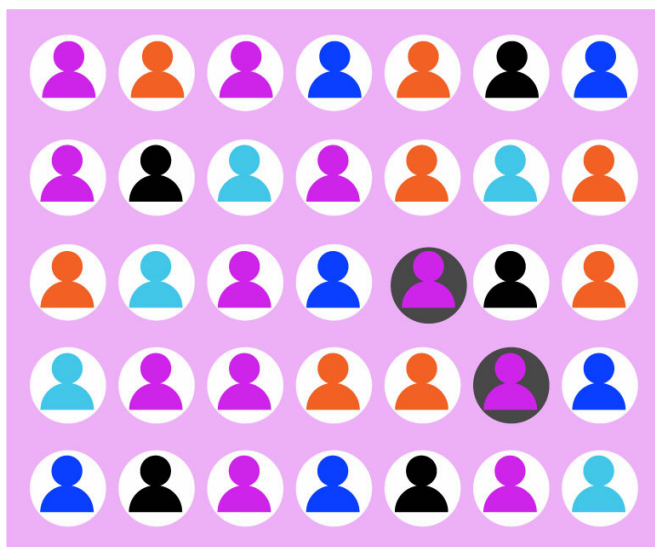and genotypic data in a cost and time-effective manner

From 150,000 individual whole genomes, identify all
individuals heterozygous for variant A and homozygous
for variant B in one second.

Variant Store

- Unprecedented ability to query, analyze, and visualize genomic variant data to identify meaningful associations across the genome.

- Robust framework for interpreting and integrating genetic variation in the context of 100s of annotation sources.

- Variant data warehouse allows performant queries of whole genome data to support aggregated visualizations and reports, direct programmatic interaction, and export for further analysis.

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Get Connected

Integrate with additional datasets, annotation sources, and optimized computational tools in an interoperable ecosystem

Create matched case-control cohorts from a population of 500,000 patients based on longitudinal outcomes relative to intervention in under a minute.

Robust and Flexible Phenotypic Data Support

- Support for industry standards like Observational Medical Outcomes Partnership and client-specific data models — enables your researchers to use the standards they are familiar with.

- Integrate diverse health data types and formats to provide a rich data exploration and analysis environment.

- Code-mapping and harmonization improve ease of use for diverse users.

- Suite of ETL processes allows for rapid data ingestion and semi-automated data harmonization across different studies.
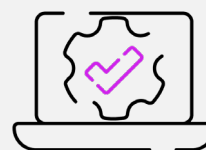
ARIA is a Purpose-Built, Modular Solution

Customizable modules provide flexibility to adapt to the unique challenges of your organization, your data and your science today, and tomorrow

Data Exploration & Query
Explore datasets to understand all the fields and select those of interest for your team.

Data Management & Curation
Curate, harmonize, and integrate fields across modalities and datasets to establish a single source of truth.
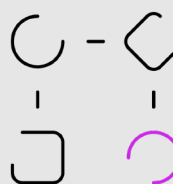
Annotation & Biological Context
Define, explore, and visualize variant annotations to accelerate research.
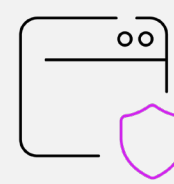
Integration & Customization
Leverage your existing infrastructure and stay connected with our solution. Export insights obtained from our solution to your enterprise data warehouse and/or analytic solutions.

Robust & Flexible Algorithms
Leverage our pre-built tools or bring your own tools and workflows to perform sophisticated analyses, from association to colocalization and beyond.

Security & Access Management
Velsera adheres to stringent security and compliance measures. Clients can stay assured that their data is safe and secure at all times.

Deep Population Genomics Expertise

Velsera also offers deep population genomic expertise from detailed quality analysis to data harmonization and optimization of analysis pipelines. Velsera Professional Services provide clients end-to-end support they need to manage their genomic and phenotypic data ecosystem. Velsera Professional Services team can serve as an extension of your in-house experts to support:

- Detailed QA/QC analysis and harmonization

- Rapid & efficient cohort selection

- Optimization of associated tools and other bioinformatics pipelines

- End-to-end workflow development/analysis for target identification, liability assessment, and risk analysis

- Population genotypic/phenotypic ecosystem consultation

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Highly Performant Data Search & Analysis

ARIA users have seen outcomes such as decreased query times by 99.8% and reduced data ingestion times from days to hours

Data Dictionary for 21,600 Field Descriptions			
Pattern match across all field descriptions in 5 sec			
Phenotypic Data for 600,000 patients across 21,600 fields			
Broad Capture (simple query*, large subset)	Time	**Precise Capture** (complex query**, small subset)	Time
Define 100,000-patient subset	2 sec	Define 5,000-patient subset	5 sec
Calculate and display statistical chart	<1 sec	Calculate and display statistical chart	<1 sec
Output 100,000-patient subset in tabular format	15 min	Output 5,000-patient subset in tabular format	1 min
Genomic Data from WGS of 140,000 patients and >1B Base Pairs			
Broad Capture (simple query*, large subset)	Time	**Precise Capture** (complex query**, small subset)	Time
Define 30,000-patient subset	2 sec	Define 1,000-patient subset	5 sec
Calculate and display statistical chart	<1 sec	Calculate and display statistical chart	<1 sec

* Simple query consists of four intersecting criteria, e.g. "LDL > 4.1 and gender = female and ..."
**Complex query consists of a union of four sets of eight intersecting criteria each.

ARIA data search and analysis as shown in this table details the typical times to perform common exploration and data preparation activities when setting up a GWAS study.

Values Enabled for our Clients through the ARIA Solution

- Enable "fast pharma" to accelerate drug discovery and target identification with real-time cohort building and data exploration, enabling you to quickly generate hypotheses and identify potential targets across multiple omics and clinical data sets.

- Maximize the value of your clinical and genomic data by seamlessly integrating and analyzing both types of data to build cohorts and unlock new insights for drug discovery and other applications.

- Collaborate and engage with expert scientists and bioinformaticians for support, leveraging their experience and expertise in deriving insights to drive drug discovery and clinical research.
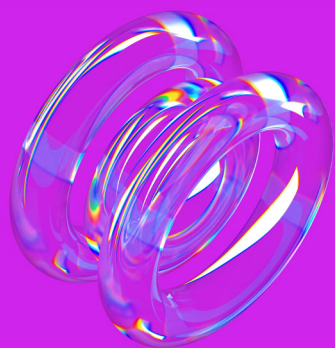
VELSERA

Usher in a New Era of Precision Medicine with ARIA

Velsera Professional Services

- Workflow Development
- Automation Development
- Large-Scale Data Processing
- Custom Portal Development
- Custom Solution Development
- Support
- Training
- Scientific & Technical Consultancy
- Data Harmonization
- Research

Let's make an impact together

The Velsera Professional and Consultative Services will work with you to customize service to meet and exceed your business goals. Partner with Velsera today to:

- Expand your organization's capabilities
- Maximize performance and productivity
- Reduce time and cost allowing for maximum return on investment
- Streamline research to deliver scientific insights reliably and quickly

For more information on ARIA and Velsera Professional & Consultative Services, please visit velsera.com or contact sales@velsera.com.

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