

# ORACLE HEALTHCARE TRANSLATIONAL RESEARCH



## INTEGRATED TRANSLATIONAL RESEARCH SOLUTION

### KEY FEATURES

- Identify new predictive biomarkers with seamless, integrated views of omics and clinical data
- Enable scientists and clinicians to easily identify and explore patient subpopulations
- Provide real-time metrics on patient populations with dashboards
- Integrate omics data irrespective of scientific modality and technology
- Data model supporting histology and mutation data from COSMIC, pharmacology data from DrugBank, and HGMD data, as well as expanded structural variation
- Supports Genome Variant Call Format (VCF) which brings genome research to the clinical environment
- Access public domain and internal data sets with open source and proprietary algorithms
- Role-based data access control
- **FHIR-like Application Programming Interface (API)**

### KEY BENEFITS

- Quickly and easily target patient populations with similar characteristics
- Collapse cycle times and minimize demands on IT by providing self-service analytics to researchers and clinicians

The comprehensive platform that enables secondary use of electronic health records and omics data to help accelerate biomarker identification for drug discovery, clinical development and translational medicine.

## Overview

Developing and implementing biomarker-guided therapies is critical to realizing the benefits of personalized medicine. Having clinical and omics data stored across a variety of systems requires time and resources to get the information that is needed into the hands of people who can turn it into useful insights — ultimately at the point of care.

Oracle Healthcare Translational Research (OHTR) is a comprehensive platform that normalizes, aggregates, controls, and analyzes all the diverse clinical and molecular data needed to support the complete biomarker lifecycle. With Oracle Healthcare Translational Research researchers have real-time access to internal proprietary data as well as external public data such as The Cancer Genome Atlas, simplifying analysis and increasing statistical power. Oracle Healthcare Translational Research offers an open platform for your choice of open source and proprietary analysis algorithms.

Oracle Healthcare Translational Research provides a 360-degree view by integrating cross-platform omics and clinical data through a single query. Researchers get the information they need to identify new predictive biomarkers and rapidly find subjects with similar clinical and omics characteristics. Oracle Healthcare Translational Research enables analysis and control capabilities that scale to millions of patients and hundreds of thousands of whole genome sequences.

## The Oracle Healthcare Translational Research Solution

Oracle Healthcare Translational Research version 3.2 consists of three powerful components, as well as Fast Healthcare Interoperability Resources (FHIR)- like APIs, enabling users to leverage the underlying data model to the fullest extent. These APIs will support applications and dashboards built by local users or connect to third party applications available through the “open source” community.

**Oracle Health Sciences Cohort Explorer.** — An intuitive Web-based user interface that enables researchers and clinicians to be self-sufficient in analyzing and identifying clinical cohorts. This helps in the discovery of therapies that will be most effective with the fewest adverse events. With real-time longitudinal views of patients, Cohort Explorer enables faster, better-quality patient stratification. Having direct access to high-quality, normalized data enables researchers to rapidly create and evaluate hypotheses,

- Save time and resources with auto-combined clinical and lab data
- Speed time to market by providing access to large sets of normalized, integrated data to find predictive biomarkers in finely targeted cohorts
- Equips users to share patient stratification criteria and other research findings with another user or a user group while maintaining data security
- Improve hypothesis and decision making with access to quality clinical data with role-defined detail

shortening discovery time while enabling IT and precious bioinformatics skills to focus on higher-value activities. It also accelerates time to market with predictive biomarkers for targeted cohorts by leveraging access to large sets of normalized, integrated data.

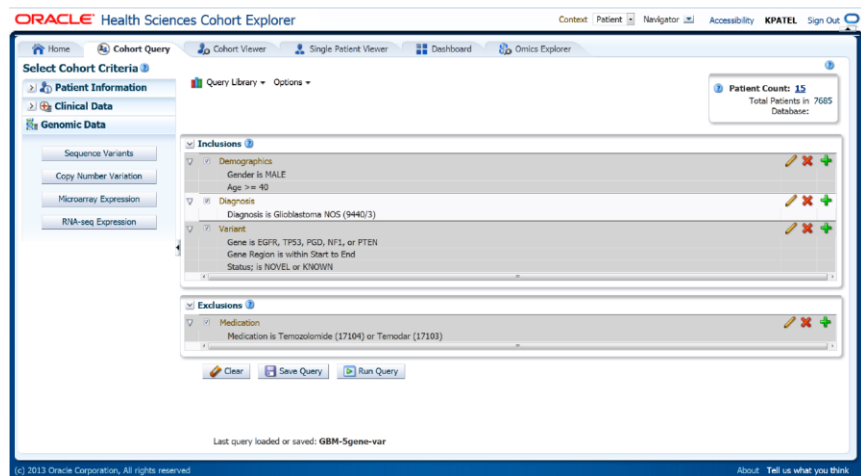


Figure 1. Querying for cohorts of patients with a combination of clinical and omics filtering criteria.

**Oracle Health Sciences Omics Data Bank**— A flexible, standards-based data model that delivers the extreme performance required for querying vast data sets typical of today's translational research studies. It enables turnkey integration and analysis of multiple types of molecular data including next generation sequencing, genotyping, and gene expression data irrespective of platform. Various data adapters for genome reference and annotations and public domain study data are available out-of-the-box in Oracle Health Sciences Omics Data Bank, enabling data annotation and cross-study omics data analysis from the get-go. This robust, scalable, cross-platform, multiomics modality model provides researchers with unprecedented power and agility in analyzing large molecular data sets from internal and external sources in the pursuit of biomarkers.

**Oracle Healthcare Data Warehouse Foundation**— A comprehensive data model for healthcare organizations that supports prebuilt and custom business intelligence and performance management applications. It rapidly unlocks value by integrating data from electronic medical records, clinical departmental systems, patient accounting, back office, research, and other source systems. In addition, it is easily extensible in any application environment. Combining costing and clinical outcome data with genomics data empowers users to conduct novel clinical and financial outcome analytics. These approaches can shed light on the full spectrum of downstream benefits of Translational Science initiatives within an institution.

## Identify Predictive Biomarkers with Real-Time Access to Clinical and Omics Data

Researchers need easy access to a vast amount of data for robust, reliable identification of biomarkers that predict phenotypes such as treatment response and rate of disease progression. By integrating omics data with clinical information, Oracle Healthcare Translational Research enables researchers to do real-time hypothesis testing.

With this latest version of Oracle Healthcare Translational Research, Oracle approximately doubled the size of the omics and clinical data models to lay a foundation for expanded insight and discovery. The clinical data model includes more than 70 major tables such as medical encounters, treatment outcomes, and patient's family medical histories. The omics data model features more than 100 total tables that model histology and mutation data from Catalog of Somatic Mutations in Cancer (COSMIC) and Human Gene Mutation Database (HGMD) data, as well as expanded structural variation in addition to the previously supported genome reference data, annotation data, and omics test result data.

With support for multiple reference genomes, clinicians and researchers are able to easily identify, track, and analyze changes to a patient's genome over the disease lifecycle. With data integrated and accessible to those defining the scientific studies, time to biomarker discovery is collapsed and demands on IT are dramatically reduced.

### Molecular Search, Visualization Engine, and Enhanced User Interfaces

In addition to patient-focused cohort queries, Oracle Healthcare Translational Research also supports queries that are gene-centric and include state-of-the-art molecular visualizations that provide holistic views of multiple omics data modalities. This integrated view is the perfect foundation for systems-biology-based approaches to further the molecular understanding of disease leading to, for example, new drug targets. Oracle Healthcare Translational Research also includes more than 50 complex workflows and user interfaces (UIs) to support search, accelerated reporting, and post-cohort analysis.

### Scalability to Answer Big Data Problems in Translational Research

When targeting new therapies, large amounts of information must be analyzed and distilled to drive decisions. Oracle Healthcare Translational Research has proven capable of integrating millions of patient records and hundreds of thousands of whole genome sequences. Providing scalability at this level ensures that, as the organization's need for genotype and phenotype analysis expands, the research platform scales. This enables both researchers and clinicians to continue delivering breakthroughs. Oracle Healthcare Translational Research solutions are optimized using Oracle Exadata high-performance hardware.

### Multiple Regulatory-Compliant Deployment Options to Satisfy Customer Needs

Unlike other commercial platforms in this space, Oracle Healthcare Translational Research can be deployed in a variety of modes depending on your organizational preference. In addition to an on-premise model, Oracle Healthcare Translational Research can also be deployed as software as a service (SaaS) in the Oracle Health Sciences cloud, that is both HIPAA certified and 21CFR Part11 compliant. The Oracle Health Sciences cloud is trusted by the world's largest biopharmaceutical companies to manage their clinical trials. In addition, its advanced data-level security capabilities enable researchers to expand collaboration while ensuring the safety of their data.

## Conclusion

As the focus on personalized medicine drives convergence in healthcare and life sciences, the need to quickly and reliably identify and validate biomarker hypotheses is increasingly important. To manage the entire lifecycle of biomarker discovery through application with the traceability needed to validate hypotheses, Oracle provides a complete solution that enables the use of open source, proprietary, and acquired algorithms. For organizations driving research and needing to compete on a global scale, Oracle offers a platform that has demonstrated true scalability appropriate for your future needs.

## Why Oracle Health Sciences

Backed by the resources of a Global 500 company, Oracle Health Sciences provides you with the industry's most comprehensive set of software solutions addressing every aspect of the health value chain from discovery to care delivery. With thousands of professionals in offices throughout North America, EMEA, and Asia, Oracle Health Sciences offers unmatched resources to enable your organization's goals, today and in the future.



### CONTACT US

For more information about Oracle Healthcare Translational Research, visit [oracle.com/healthsciences](http://oracle.com/healthsciences), email [healthsciences\\_www\\_grp@oracle.com](mailto:healthsciences_www_grp@oracle.com) or call +1.800.633.0643 to speak to an Oracle representative.

### CONNECT WITH US



[oracle.com/healthsciences](http://oracle.com/healthsciences)



[healthsciences\\_ww\\_grp@oracle.com](mailto:healthsciences_ww_grp@oracle.com)



[youtube.com/user/oraclehealthsciences](https://www.youtube.com/user/oraclehealthsciences)



[facebook.com/oraclehealthsciences](https://www.facebook.com/oraclehealthsciences)



[twitter.com/oraclehealthsci](https://twitter.com/oraclehealthsci)

### Integrated Cloud Applications & Platform Services

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. This document is provided for information purposes only, and the contents hereof are subject to change without notice. This document is not warranted to be error-free, nor subject to any other warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchantability or fitness for a particular purpose. We specifically disclaim any liability with respect to this document, and no contractual obligations are formed either directly or indirectly by this document. This document may not be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without our prior written permission.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group. 0317

