# ABOUT THE **REGENERON GENETICS CENTER** (RGC)

REGENERON™ GENETICS CENTER

**The objective of the RGC is to apply high-throughput genomic approaches to speed drug discovery and development, through identifying new drug targets and validating existing programs, ultimately helping patients in need. The RGC is a comprehensive, fully integrated genomics program that builds on Regeneron's well-established expertise in genetics and related technologies. The RGC is a wholly-owned subsidiary of Regeneron Pharmaceuticals, Inc.**

## WHAT THE RGC DOES

- The RGC uses state-of-the-art automation and cloud-based informatics to enable sequencing and genotyping across hundreds of thousands of samples.
- By pairing the sequence data with de-identified real-world electronic health records and other clinical datasets, the RGC can make associations between certain genes and diseases in order to:
  - Identify Genetic Variants Associated with Disease
  - Identify Novel Targets for Drug Development and Validate Targets From Existing R&D
  - De-risk Drug Targets By Studying Genetic Safety Profiles
- As part of Regeneron's integrated discovery-to-commercialization process, the RGC's findings can be used to initiate and validate clinical explorations and inform the ongoing translational medicine approaches of many therapeutic and clinical groups at the company. In this way, the RGC allows Regeneron to potentially speed and optimize the drug development process.

## HOW THE RGC IS UNIQUE

- Among the largest genetic centers in the world in terms of scale and scope – sequenced the DNA from over 100,000 people and currently sequencing at a rate of more than 100,000 samples per year
- Can evaluate a range of different diseases and traits
- Broad and field-leading group of more than 25 collaborators offers access to diverse sets of large-population, founder-population and family-based DNA samples from well-characterized patients
- One of the only genomic initiatives fully integrated into a successful R&D process at a proven biopharmaceutical company
- State-of-the-art proprietary technology, as well as partner capabilities including Illumina sequencers, Amazon Web Service cloud computing and DNAnexus data management framework

The New York Times

Aiming to Push Genomics Forward in New Study

"Scientifically and medically, it's pretty exciting. As far as I'm aware, it's the largest clinical sequencing undertaking in this country so far by a long shot."

**DR. LESLIE G. BIESECKER,** chief of the Genetic Research Branch at the National Human Genome Research Institute

BARRON'S

Regeneron: The Best Bet in Biotech Stocks

"There are sequencing efforts underway elsewhere, of course, but none matches Regeneron's for its combination of size, speed, diversity of samples, and detail of their accompanying health records."

## OUTCOMES TO DATE

Sequenced DNA from **100,000 people** as of Q1 2016

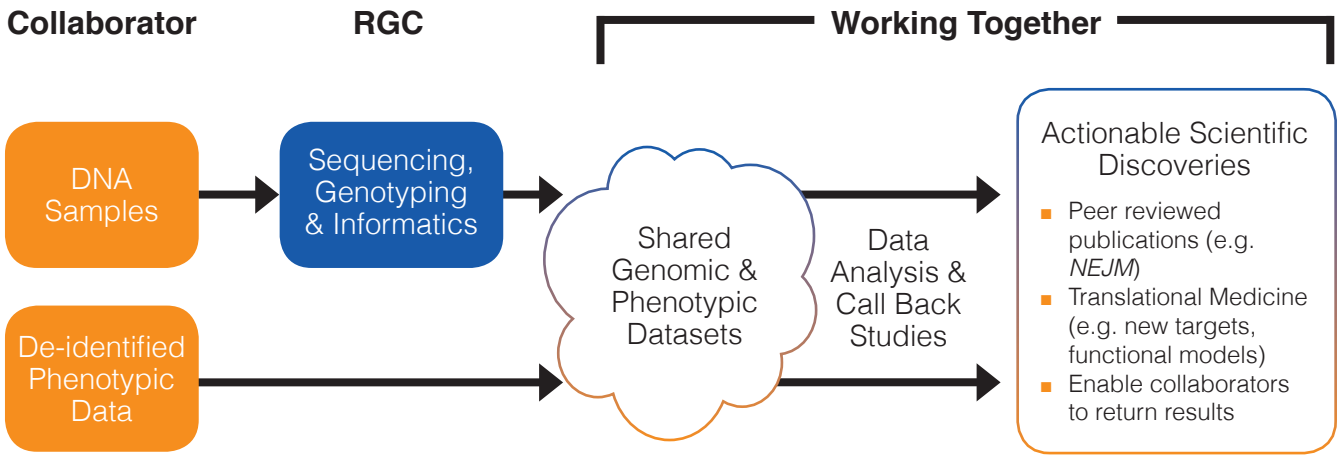
**20 candidate** gene targets identified

Predicted loss of function variants identified for **virtually all** of Regeneron's target genes

**Actionable discoveries** in peer-reviewed publications, including *New England Journal of Medicine*

## OUR COLLABORATION MODEL

**The RGC is collaborating with an outstanding group of leading academic institutions, government organizations and integrated medical systems. Our collaborative model is focused on working closely together to gather and analyze data, exchange expert perspectives and ultimately make discoveries that will lead to improved patient care.**




"The relationship with Geisinger is a cornerstone of the effort the Regeneron Genetics Center is building, which we believe can advance the goals of human genetics research and personalized medicine."

**GEORGE D. YANCOPOULOS, M.D., PH.D.,**
Chief Scientific Officer, Regeneron Pharmaceuticals and President, Regeneron Laboratories

"For Geisinger, this relationship is about the potential to improve individualized patient care...we expect that many of our patients and their family members will directly benefit from their participation in this research."

**DAVID H. LEDBETTER, PH.D.,**
Executive Scientific Officer and Chief Scientific Officer, Geisinger Health System

## RGC COLLABORATORS INCLUDE:

**GENERAL POPULATION**

Geisinger

Lund University

LABioMed

**FAMILY-BASED STUDIES**

BCM Baylor College of Medicine

Columbia University Medical Center

SickKids Inflammatory Bowel Disease Centre

**FOUNDER POPULATIONS**

Clinic for Special Children

University of Maryland School of Medicine

ecogene21

**DISEASE AREA FOCUS**

Penn Medicine

University of Utah Health Sciences

Duke Molecular Physiology Institute

UConn Health

## RGC LEADERSHIP

**Alan Shuldiner, M.D.,**
Vice President and Co-Head of the RGC

**Aris Baras, M.D.,**
Vice President and Co-Head of the RGC

**Ingrid Borecki, Ph.D.,**
Executive Director, Analytical Genetics

**Rick Dewey, M.D.,**
Senior Director, Translational Genetics

**Omri Gottesman, M.D.,**
Senior Director, Clinical Informatics

**John Overton, Ph.D.,**
Senior Director, Sequencing and Lab Operations

**Jeffrey Reid, Ph.D.,**
Executive Director, Genome Informatics

## RGC FOUNDERS

**George Yancopoulos, M.D., Ph.D.,**
Founding Scientist, President, Regeneron Laboratories & Chief Scientific Officer

**Aris Baras, M.D.,**
Vice President and Co-Head of the RGC

**Aris Economides, Ph.D.,**
Executive Director, Genomic Technologies

**Scott Mellis, M.D., Ph.D.,**
Vice President, Clinical Sciences Translational Medicine

**Andrew Murphy, Ph.D.,**
Senior Vice President, Research

**Robert Phillips, Ph.D.,**
Senior Director, Predictive Medicine

**Neil Stahl, Ph.D.,**
Executive Vice President, Research and Development

"Regeneron's science-driven culture and track record of solving key R&D challenges uniquely positions the RGC to rapidly translate genetic discoveries into medical innovations and therapies that can truly help patients."

**RICHARD LIFTON, M.D, PH.D.**
Scientific Advisory Board Chair; President of the Rockefeller University and an investigator at the Howard Hughes Medical Institute

## SCIENTIFIC ADVISORY BOARD

**Richard Lifton, M.D., Ph.D.**,
Scientific Advisory Board Chair; President of the Rockefeller University and an investigator at the Howard Hughes Medical Institute

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Chairman of the Department of Biostatistics and Felix E. Moore Collegiate Professor of Biostatistics at the University of Michigan

**Wendy Chung, M.D., Ph.D.**,
Herbert Irving Associate Professor of Pediatrics at Columbia University Medical Center

**Peter Donnelly, Ph.D.**,
Professor of Statistical Science and Director of the Wellcome Trust Centre for Human Genetics

**Tim Hunkapiller, Ph.D.**,
President of Discovery Biosciences Corporation

**Sekar Kathiresan, M.D.**,
Director of Preventive Cardiology at Massachusetts General Hospital, Associate Member in the Broad Institute's Program in Medical and Population Genetics, and Associate Professor of Medicine at Harvard Medical School

**James R. Lupski, M.D.**, **Ph.D., D.Sc. (hon)**
Cullen Professor of Molecular and Human Genetics, Professor of Pediatrics, and Member Human Genome Sequencing Center at Baylor College of Medicine

**Elaine Mardis, Ph.D.**,
Co-Director at the Genomics Institute at Nationwide Childrens Hospital

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