



PRESS KIT

TABLE OF CONTENTS:

LGRC Fast Facts

History ♦ Mission and Goals ♦ Funding (pg. 2)

Who's Who in the Consortium (pg. 3)

Quotes (pg. 8)

FAQs (pg. 9)

Contact List (pg. 11)

LGRC FAST FACTS

History ♦ Mission and Goals ♦ Funding

History

- ◆ Formed in 2009, the LGRC (Lung Genomics Research Consortium) is a group of leading scientists from five prominent U.S. research institutions who are working together, and with outside research and technology partners, to transform our understanding of devastating chronic lung diseases, including chronic obstructive pulmonary disease (COPD) and interstitial lung disease (ILD) such as pulmonary fibrosis.

Mission and Goals

- ◆ The LGRC's mission is to use cutting-edge genomic technologies that have emerged from the Human Genome Project, together with patient lung tissue samples and associated clinical data, to create a rich data resource that will allow scientists to learn more about the genetic events involved in the development of lung disease. The questions we want to answer include why certain people suffer from lung disease when others don't, what environmental factors trigger the occurrence of lung disease, whether we can develop reliable diagnostic tests for earlier detection, and how best to tailor treatments to address the needs of individual patients.

- ◆ The specific goals of the LGRC are to:
 - generate a rich resource of genetic and genomic data about lung disease;
 - build a database to catalog this information; and
 - share the database with the scientific community through an easy-to-use website.

Funding

Initial funding for the LGRC is provided by a two-year, \$11 million grant from the National Heart, Lung, and Blood Institute, which has been made possible by funds appropriated for the National Institutes of Health as part of the federal government's American Recovery and Reinvestment Act (ARRA) of 2009.

WHO'S WHO IN THE LGRC

FIVE MEMBER INSTITUTIONS comprise the LGRC:

National Jewish Health, Center for Genes, Environment, and Health (CGEH), Denver, CO

In addition to performing the LGRC's deep sequencing and methylation studies, the CGEH coordinates the consortium's efforts as a whole and administers its federal funding. Dr. David Schwartz of the CGEH heads the LGRC's steering committee, working directly with the National Heart, Lung, and Blood Institute to ensure that the LGRC achieves its goals.

Dana-Farber Cancer Institute, Center for Cancer Computational Biology (CCCB), Boston, MA

As the data-coordinating center for the LGRC, the CCCB monitors the flow of data and information among the consortium members, collects and integrates it, develops new methods to analyze the data, and presents this information to the scientific community. The CCCB also leads the LGRC's public outreach and education project by maintaining its website.

University of Pittsburgh, Dorothy P. and Richard P. Simmons Center for Interstitial Lung Disease (CILD)

Along with the university's Lung, Blood and Vascular Center for Genomic Medicine, the CILD serves as the LGRC's hub for extracting DNA and RNA from the approximately 1,300 lung tissue samples received from the Lung Tissue Resource Consortium (LTRC). It also performs gene expression and microRNA analyses to better understand the genetic factors that contribute to COPD and ILD.

Boston University, Section for Computational Biomedicine and The Pulmonary Center

Investigators at Boston University are performing next-generation sequencing studies using the RNA extracted from the LTRC's tissue samples. This advanced technology provides an unprecedented view of the changes in gene and microRNA expression, changes in gene structure, and the mutational spectrum that occur in chronic lung disease.

University of Colorado Denver, Genomics Core Facility

The Genomics Core Facility is searching for changes that occur in the DNA of patients suffering from COPD and ILD to gain insight into the genes associated with lung disease. More important, by combining information about these changes with other data generated by the LGRC partners, it hopes to understand how and why these genetic changes manifest to cause disease.

SEVEN PRIMARY INVESTIGATORS are leading the LGRC's research efforts:

Mark Geraci, M.D.

Professor of Medicine

Director, Translational Medicine Program

University of Colorado, Denver

Geraci heads the University of Colorado Denver's Division of Pulmonary Sciences and Critical Care Medicine, the country's largest division in the pulmonary sciences. His work in lung disease involves applying various genomic approaches and sophisticated mouse models to the study of lung cancer. Geraci is driven first by discovery, then by turning findings into clinical trials, and, finally, putting it all into practice with patients.

Naftali Kaminski, M.D.

Professor of Medicine, Pathology, Human Genetics, and Computational Biology

Director, Dorothy P. and Richard P. Simmons Center for Interstitial Lung Disease

University of Pittsburgh

An expert in idiopathic pulmonary fibrosis (IPF), Kaminski has pioneered the use of microarray technology in the study of the disease. He also directs a team of innovative investigators at the university's Division of Pulmonary, Allergy and Critical Care Medicine. He views using genomics to study disease as the deepest way to address patients' expectations and desire to understand their disease, and to find the medical answers that will help them.

John Quackenbush, Ph.D.

Professor of Biostatistics and Computational Biology

Director, Center for Cancer Computational Biology (CCCB)

Dana-Farber Cancer Institute (DFCI)

As an expert in genomics and bioinformatics, Quackenbush has pioneered many advances in the technologies behind these two sciences. At DFCI, he designed and implemented a clinical and research data warehouse, merging information from multiple sources to make it readily accessible; thus by integrating diverse information, allowing new discoveries to be made. His research interest involves understanding the pathways and networks that keep cells healthy and how these pathways break down in disease. He is leading efforts to collect, manage, and analyze the data being produced by the LGRC, making it available to other scientists who are studying lung disease.

David Schwartz, M.D.

Professor of Medicine, Pediatrics, and Immunology

Director, Center for Genes, Environment, and Health

Provost, National Jewish Health

Schwartz, an expert in the lungs and the immune system, has spent many years studying why some individuals develop lung disease and infections while others remain healthy. His goal is to use the differences in disease susceptibility to develop better, personalized treatments that are tailored for each individual and his or her genetic makeup. A longstanding interest of his has been the interplay between genetics and the environment. He brings critical expertise in genomics and other advanced technologies to the LGRC.

Frank Scirba, M.D.

Associate Professor of Medicine

Director, Emphysema Research Center

Department of Medicine, University of Pittsburgh

Scirba, an expert in COPD, applies cutting-edge molecular techniques toward solving the many remaining mysteries of respiratory illness. His role in the LGRC is to carefully categorize the tissue samples of participating patients and analyze them for shared clinical characteristics. This

will provide LGRC scientists with a better understanding of the unique biological mechanisms that influence the progression of disease and ultimately lead to personalized therapies for these diseases.

Avrum Spira, M.D.

Associate Professor of Medicine

Adjunct Associate Professor of Bioinformatics

Director, Translational Bioinformatics Program

Boston University

Skilled in the fields of medicine and bioinformatics, Spira works to develop novel tools that can help doctors manage patients with tobacco-related chronic diseases, such as COPD and lung cancer. Driven by the pressing need for finding new molecular-based methods for diagnosing these diseases earlier and more accurately, Spira leads a research group that employs a variety of experimental, statistical, and computational methods to analyze gene expression patterns in the airway and in lung tissue.

Ivana Yang, Ph.D.

Assistant Professor of Medicine

Deputy Director, Center for Genes, Environment, and Health

National Jewish Health

Yang has devoted her career to doing research in genomics and genetics, focusing on using genomics to study lung diseases so she can better understand the factors, such as the body's innate immune response, that lead to disease. Having developed a variety of instruments and technical approaches for analyzing genomic data, Yang leads the LGRC's whole-genome analyses and epigenetic profiling efforts on patients with COPD and pulmonary fibrosis.

FOUR RESEARCH INSTITUTIONS are partnering with the LGRC:

The Lung Tissue Research Consortium (LTRC)

The LTRC collects large numbers of lung tissue samples and other invaluable medical data from patients with lung disease, primarily COPD and ILD. These materials, so generously donated by

patients, are the single most important resource enabling the LGRC to investigate the genomic changes that occur in lung disease.

The University of Michigan and the Mayo Clinic

Our partners, Fernando Martinez of the University of Michigan and Andrew Limper of the Mayo Clinic, are physician-scientists who specialize in lung disease and are helping LGRC investigators precisely define the physical characteristics, or phenotypes, of COPD and ILD so that the patient samples that are analyzed can be appropriately classified.

The National Heart, Lung, and Blood Institute (NHLBI)

It is funding from the NHLBI, of the National Institutes of Health, that has made the work of the LGRC possible. The NHLBI's administration and program officers have been instrumental in both supporting the collection of comprehensive genomic data on lung diseases and helping the consortium define and refine its scientific mission.

NINE COMPANIES are partnering with the LGRC:

Agilent, Applied Biosystems, Illumina, Nimblegen (Roche), and Wafergen are responsible for having developed the advanced technologies being used by LGRC researchers to create state-of-the-art genetic and molecular portraits of COPD and ILD.

IDBS and **Oracle** are software companies whose tools allow the LGRC to sensibly organize the vast amounts of information being generated, thereby making it easily accessible to researchers around the world.

Bio Team is a life-science informatics company that is helping the LGRC manage its flow of biological samples and data through the development of a sophisticated tracking and information management system.

Acscys Interactive is the LGRC's partner in building a user-friendly and informative website for the public that explains the LGRC's goals and accomplishments.

QUOTES

*"Our aim is create a **genetic and molecular treasure trove for the research community to redefine these lung diseases precisely and unequivocally. The genetic, epigenetic, transcriptional, and phenotypic data we generate will provide an unprecedented window into the origins, dynamic biological features and unique presentations of these diseases. It will allow researchers to make **fundamental discoveries that help identify individuals at risk for these diseases, diagnose them earlier, and develop more effective, personalized treatments.*****

—David Schwartz, M.D., M.P.H., Provost and Director of the Center for Genes, Environment, and Health at National Jewish Health

*"**Modern genomic technologies have transformed biomedical research from what was once a purely laboratory science into an information science. The LGRC is attempting to create the most comprehensive compendium of genomic and other information ever assembled for the study of COPD and ILD. In doing so, the LGRC project aims to produce an **invaluable resource to enable better characterization and treatment** of these deadly and poorly served lung diseases.**"*

—John Quackenbush, Ph.D., Director of the Center for Cancer Computational Biology at the Dana-Farber Cancer Institute

"Using genomics to study lung disease is the deepest way we can address our patients' expectations and desire to understand their disease and to find something that could help them."

—Naftali Kaminski, M.D., Director, Dorothy P. and Richard P. Simmons Center for Interstitial Lung Disease at the University of Pittsburgh

"It is so exciting that we are using cutting-edge genomic technologies to develop a tremendous resource for the research community that will ultimately lead to better treatments for chronic lung disease."

—Ivana Yang, Ph.D., Deputy Director, Center for Genes, Environment, and Health at National Jewish Health

FAQs

What Is Chronic Obstructive Pulmonary Disease (COPD)? COPD represents a broad spectrum of chronic fibrosing and inflammatory lung conditions that cause coughing with heavy mucus production, wheezing, shortness of breath, and chest tightness, among other symptoms. The disease is chronic, progressive, and has few effective treatments, making it the fourth leading cause of death in the United States. Right now, predicting who is at risk for COPD is not possible. The LGRC seeks to change this.

What Is Interstitial Lung Disease (ILD)? ILD is actually a group of progressive disorders that are marked by the scarring, or fibrosis, of lung tissue. The disease, which includes pulmonary fibrosis, kills about 40,000 Americans each year, and its incidence has doubled in the past decade. There are many causes of ILD, including occupational or environmental exposure to irritants like asbestos and silica, radiation therapy, some types of chemotherapy drugs, and connective tissue diseases like lupus and rheumatoid arthritis. Few effective treatments exist for pulmonary fibrosis and other forms of ILD.

What Does the Human Genome Project Have to Do with the LGRC? In 2003, the Human Genome Project (HGP) completed a basic “map” of the human genome—the entire sequence of the DNA found in each of our body’s cells. With the information from the HPG and the resulting new genomic technologies available to researchers, the LGRC is poised to make unprecedented advances in understanding lung disease and, ultimately, in improving the prediction, diagnosis, and treatment of these devastating diseases.

How Is Genomic Research on Lung Disease Being Conducted?

The Lung Tissue Research Consortium (LTRC) is providing the LGRC with approximately 1,300 lung tissue samples donated by patients with lung disease, along with comprehensive clinical data about the disease state, patient exposure to cigarette smoke and other harmful agents, and other relevant health information such as X-rays and CT-scan data. Using sophisticated genomics-based technologies, the LGRC is studying these tissue samples to determine whether

genes are mutated, when genes are activated, and how the structure of the DNA itself is modified as lung disease develops.

This genomic research data and the LTRC's clinical data is being combined into a large, integrated database, or "information warehouse," available to any scientist interested in researching lung disease. The database resource will give scientists the opportunity to arrive at new ways of identifying people at greater risk of chronic lung diseases, diagnosing their conditions earlier, determining the causes of lung disease, and tailoring treatments to an individual's unique genetic makeup.

What Are Examples of Cutting-edge Genomic Technologies?

Genomic analysis of disease can be conducted using genome sequencing, genome-wide association studies, and whole-genome gene expression analysis. By applying these technologies, as well as the science of bioinformatics, in innovative ways, the LGRC can obtain a more complete molecular picture of lung disease than could be had using any one method alone.

CONTACT LIST

Thank you for your interest in the LGRC. If you wish to contact us, please note the information below.

For general inquiries regarding the LGRC, contact:

John Quackenbush
Dana-Farber Cancer Institute
Harvard School of Public Health
617-582-8163
johnq@jimmy.harvard.edu

To request an interview with an LGRC investigator, contact:

Press@lung-genomics.org

For inquiries about the LGRC website (www.lung-genomics.org), contact:

Niall O' Connor
Dana-Farber Cancer Institute
oconnor@jimmy.harvard.edu

To be notified of updates made to our website and of press releases, publications, or events:

Write to maillist@lung-genomics.org and include "subscribe" in the subject line.