

PROGRAMS FOR GENOMIC APPLICATIONS

*National Heart, Lung, and Blood Institutes
National Institutes of Health*



Mission Statement

To develop new resources, reagents, and education programs for investigators engaged in NHLBI-related research.

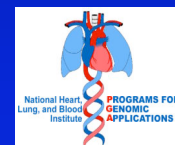
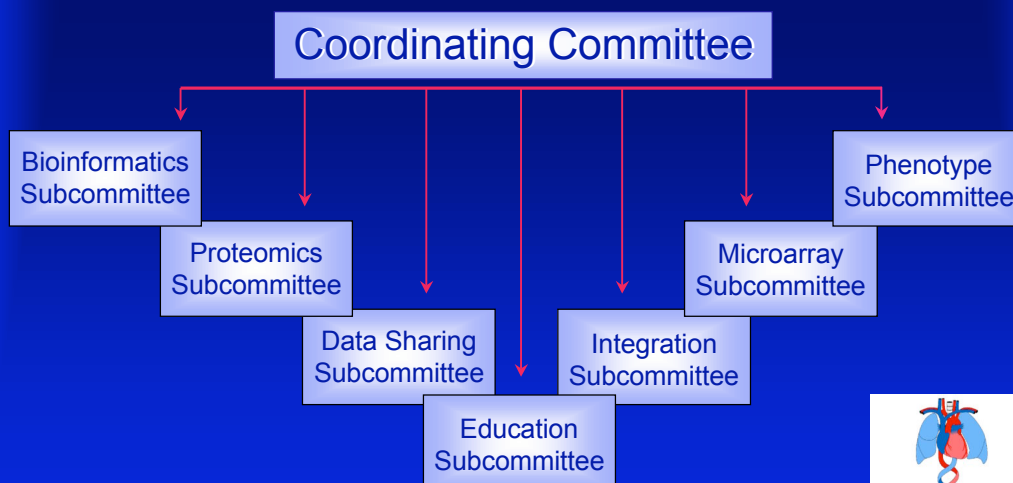


PGA Mission

- Provide new resources and reagents to link genes to biological function and make these readily available to the NHLBI community.
- Facilitate workshops, courses, and visiting scientist programs to train investigators in the technologies being applied in the PGAs.
- Rapidly disseminate data through the world wide web and public databases.



Organizational Structure



PGA Programs

Applied Genomics in CardioPulmonary Disease

Johns Hopkins University School of Medicine

Genomics of Cardiovascular Development, Adaptation, & Remodeling

Harvard Medical School

Physiogenomics of Stressors in Derived Consomic Rats

Medical College of Wisconsin

Genomics of Proteomics of Cell Injury and Inflammation

University of Texas S.W. Medical Center

Innate Immunity in Heart, Lung, and Blood Diseases

The University of Arizona

UW-FHCRC Variation Discovery Resource

University of Washington

Mouse Models of Heart, Lung, and Blood Diseases

The Jackson Laboratory

Expression Profiling of Rodent Models of Human Disease

The Institute for Genomics Research

Comparative Genomic Analysis of Cardiovascular Genes

Lawrence Berkeley National Laboratory

Genomic Analysis of Stress and Inflammation

Harvard Medical School

NHLBI Bay Area Functional Genomic Consortium

The David J. Gladstone Institute



Bioinformatics

- Carol Bult, Ph.D., *The Jackson Laboratory*

Data Sharing

- Isaac Kohane, M.D., Ph.D., *Harvard Medical School*

Education

- Scott Weiss, M.D., M.S., *Harvard Medical School*

Genomic Inventory/Integration

- Edward Rubin, M.D., Ph.D., *The Lawrence Berkeley National Laboratory*

Microarray

- John Quackenbush, Ph.D., *The Institute for Genomics Research*

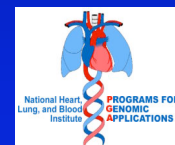
Phenotype

- Andrew Greene, Ph.D., *Medical College of Wisconsin*

Proteomics

- Thomas Kodadek, Ph.D., *Univ. Texas S.W. Medical Center*

Subcommittee Chairs



Anticipated PGA Resources/Tools

- Mouse models of HLBS disorders
- Rat models of HLBS disorders
- Microarrays
- DNA Variations (SNPs - locations, allele frequencies, genotypes and haplotypes)
- Reagents (clones, antibodies, mice, and rats)
- Protocols
- Bioinformatic Resources (software tools and databases)



BayGenomics

<http://baygenomics.ucsf.edu>

Focus: Cardiopulmonary Development and Disease

- Apply custom gene-trap vectors to inactivate genes in ES cells and to evaluate the functional importance of these in cardiopulmonary development and disease using computational approaches, expression profiling, *in situ* hybridization studies, and in select cases in animals.

PI: Dr. Stephen G. Young



CardioGenomics <http://www.cardiogenomics.org>

Focus: Cardiovascular Development, Adaptation, and Remodeling

- To link genes to function, dysfunction, and structural abnormalities of the cardiovascular system caused by clinically relevant genetic and environmental stimuli.

PI: Dr. Seigo Izumo

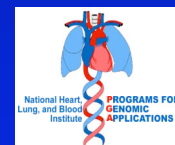


HopGenes <http://www.hopkins-genomics.org>

Focus: Tissue Remodeling in Cardiopulmonary Disease

- To identify the genes involved in tissue remodeling using expression profiling to explore the pathology of asthma, chronic obstructive pulmonary disease, cystic fibrosis, lung transplantation, acute lung injury, scleroderma, sarcoidosis, pulmonary hypertension, ischemic cardiomyopathy, and cardiac transplantation.

PI: Dr. Joe G.N. Garcia



Innate Immunity

<http://innateimmunity.net>

Focus: Genetics of HLB Disorders

- Explore genetic susceptibility in asthma, chronic obstructive pulmonary disease, myocardial infarction and deep venous thrombosis by evaluating polymorphisms in genes involved in innate immune responses.

PI: Dr. Fernando D. Martinez



JAX PGA

<http://pga.jax.org>

Focus: Mouse Models of HLBS Disorders

- Apply a phenotype-driven approach to identify the genetic mechanisms underlying the physiology and pathophysiology of atherosclerosis, hypertension, lung function, blood formation, thrombosis, obesity, inflammation, and sleep function.

PI: Dr. Luanne L. Peters



PARABIOSYS

<http://genetics.mgh.harvard.edu/Parabiosys/>

Focus: Genetics of Inflammation and Stress

- To identify and characterize the gene networks activated by pro-inflammatory, metabolic, and pathogenic stresses affecting cardiovascular and pulmonary systems.

PI: Dr. Brian Seed



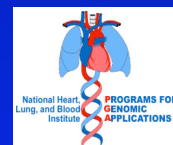
Berkeley PGA

<http://pga.lbl.gov>

Focus: Cardiovascular Gene Expression

- Apply comparative genomics to identify and understand the role of cis-acting regulatory elements that affect the expression of cardiovascular genes.

PI: Dr. Edward M. Rubin



PhysGen

<http://pga.mcw.edu>

Focus: Rat Models of HLBS Disorders

- Dissect multigenic common HLBS diseases through the development of panels of chromosomal substitution strains of rats (consomic rat panels).

PI: Dr. Howard J. Jacobs



Seattle SNPs

<http://pga.mbt.washington.edu>

Focus: Inflammation and Genetic Variability

- To identify variable sites in human genes to expand the resources available to explore the role of inter-individual variation and its relationship to disease risk, outcome and treatments for common human disorders.

PI: Dr. Deborah A. Nickerson



Southwestern

<http://pga.swmed.edu>

Focus: Cell Injury and Inflammation

- Elucidate the basic mechanisms underlying cell injury and inflammation through a combination of genomic and proteomic approaches.

PI: Dr. Stephen A. Johnston



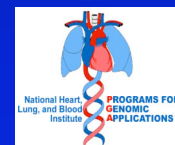
TREX

<http://pga.tigr.org>

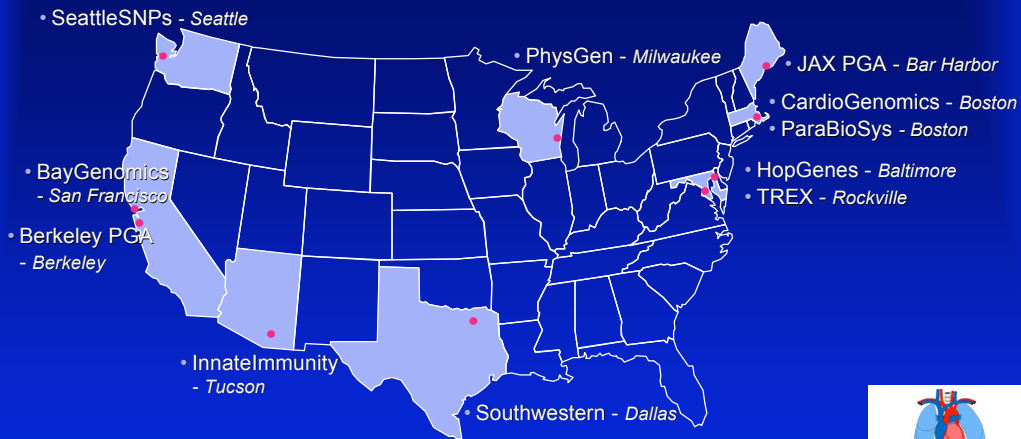
Focus: Gene Expression in HLBS Disorders

- Explore gene-environment interactions using rodent models of human disease and cDNA microarray assays to elucidate patterns of gene expression in heart, lung, blood, and sleep disorders.

PI: Dr. John Quackenbush



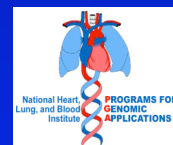
NHLBI PGA Research Network



NHLBI PGA Web Sites

PROGRAMS FOR GENOMIC APPLICATIONS

<http://www.nhlbi.nih.gov/resources/pga/index.htm>



PGA Web Sites (cont.)

BayGenomics - <http://baygenomics.ucsf.edu>

CardioGenomics - <http://www.cardiogenomics.org>

HopGenes - <http://www.hopkins-genomics.org>

InnateImmunity - <http://innateimmunity.net>

JAX PGA - <http://pga.jax.org>

ParaBioSys - <http://genetics.mgh.harvard.edu/Parabiosys/>



PGA Web Sites (cont.)

Berkeley PGA - <http://pga.lbl.gov>

PhysGen - <http://pga.mcw.edu>

SeattleSNPs - <http://pga.mbt.washington.edu>

Southwestern - <http://pga.swmed.edu>

TREX - <http://pga.tigr.org>

