

Elissa J. Chesler, Ph. D.

Associate Professor
The Jackson Laboratory
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Bar Harbor, ME 0460
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Curriculum Vitae

Institutional Affiliations:

Institute for Systems Genomics, UConn/The Jackson Laboratory
School of Biomedical Sciences, External Graduate Faculty, University of Maine

Positions Held:

- 8/12–present The Jackson Laboratory, Bar Harbor, ME
Associate Professor, Bioinformatics and Computational Biology
- 9/09–8/12 The Jackson Laboratory, Bar Harbor, ME
Assistant Professor, Bioinformatics and Computational Biology
- 10/06–8/09 Oak Ridge National Laboratory – UT-Battelle, LLC
Group Leader, Systems Genetics Group (Former Mammalian Genetics and Genomics Group),
Biosciences Division (Former Life Sciences Division)
- 8/05–10/06 Oak Ridge National Laboratory – UT-Battelle, LLC
Staff Scientist, Mammalian Genetics and Genomics Group, Life Sciences Division
- 9/05–9/10 University of Tennessee, Knoxville, TN
Adjunct Assistant Professor, Genome Science and Technology Program
- 7/04–7/05 University of Tennessee Health Science Center, Memphis, TN
Research Assistant Professor, Williams Lab, Department of Anatomy and Neurobiology, Center for
Genomics and Bioinformatics
- 7/02–7/04 University of Tennessee Health Science Center, Memphis, TN
Post-Doctoral Research Trainee, Department of Anatomy and Neurobiology, Center for Genomics and
Bioinformatics. Advisors: Dr. Robert W. Williams, Dr. Daniel Goldowitz

Education:

- 6/02 Doctor of Philosophy in Neuroscience, University of Illinois at Urbana-Champaign
Neuroscience Program, Advisor: Jeffrey S. Mogil
Thesis: Use of Inbred Strains for the Study of Individual Differences in Pain Related Phenotypes
in the Mouse
- 8/97–8/98 University of Illinois College of Medicine, First year medical curriculum, Medical Scholars Program
University of Illinois at Urbana-Champaign
- 8/97 Master of Science, University of Illinois at Urbana-Champaign
Biological Psychology, Medical Scholars Program, Advisor: Janice M. Juraska
Thesis: Sex and age effects on dendritic spine density of CA1 hippocampal pyramidal neurons
- 5/95 Bachelor of Science, University of Connecticut
Double Major in Psychology/Physiology and Neurobiology
Honors in Psychology, Summa Cum Laude, University Scholar, Advisor: John D. Salamone
Thesis: A rat model for anti-parkinsonian effects of Clozapine: Interactions of clozapine with
cholinomimetic drugs

Honors & Awards:

Summer Undergraduate Research Fellow, University of Connecticut School of Medicine, 1993
Julius A. Elias Scholarship, University of Connecticut, 1994–1995
Outstanding Woman Scholar from College of Liberal Arts & Sciences, University of Connecticut, 1995
Phi Beta Kappa, Psi Chi, Phi Kappa Phi and Alpha Lambda Delta Honor Societies
Fellow, Graduate College, University of Illinois at Urbana-Champaign, 1995–1996
Early Career Award for Scientific Accomplishment-UT-Battelle Oak Ridge National Laboratory, 2006
Young Scientist Award, International Behavioral and Neurogenetics Society, 2007

Grant Review Panels:

11/8/04 NIH Special interest review panel member for NIDCR and NINDS RFA-DE-05-004 “Mechanisms of orofacial pain: Anatomy, genomics and proteomics”
2006 Israel Science Foundation, Ad Hoc Reviewer.
2006–present National Science Foundation, Ad Hoc Reviewer
3/29/07 NIH Special Emphasis Panel to review NIEHS Environmental stress centers U54 RFA-ES-06-012 and U01 RFA-ES-06-013 Biological response indicators of environmental stress.
11/07 NIH Ad hoc reviewer “Biobehavioral Regulation, Learning and Ethology Study Section (BRLE)”
10/07, 5/09 Wellcome Trust, Ad Hoc Reviewer
2009 Biotechnology and Biological Sciences Research Council, UK, Ad Hoc Reviewer
2009 Genome Canada, Ad Hoc Reviewer
2008 NIH Ad hoc reviewer “Genomic, Computational Biology and Technology Study Section (GCAT)”
2009–present Member NIH: Genomic, Computational Biology and Technology Study Section (GCAT)

Committees and Additional Professional Activities:

1998–2001 Medical Scholars Program Advisory Committee, Co-Chair
2000 International Behavioral Neuroscience Society, Student Representative to Council.
2002 International Behavioral Neuroscience Society, Student Member of Program Committee
2003–2004 Consultant, Protocol power analysis, Uniformed Services University of the Health Sciences
2005 UT-Knoxville Genome Science and Technology Computational Biology & Bioinformatics Task Force
2005 International Phenome Database Integration Committee
2009–2010 Society for Neuroscience, Neuroinformatics Committee
2010–present International Behavioral and Neurogenetics Society (Executive Committee Member)
2011 Scientific Advisory Committee, The Jackson Laboratory
2011–present External Advisory Board, Monkey Alcohol Tissue Research Resource.
2012–present International Mouse Phenotyping Consortium (IMPC) Statistical Working Group, Chair
2012–present Editorial Board, Genes, Brain, Behavior
2012–present Editorial Board, Mammalian Genome
2013 External Advisor to SYSGENET European Union COST consortium
2013 Workshop Participant, NIH Big Data to Knowledge Workshop on Enhancing Training for Biomedical Big Data

Manuscript Referee:

Genetics; Genome Research; Genomics; Alcoholism: Clinical and Experimental Research; Current Biology; Public Library of Science (PLOS) Biology; Public Library of Science (PLOS) Genetics; Genes, Brain, and Behavior; Bioinformatics; Nature; Nature Genetics; BMC Genomics; Mammalian Genome; Science

Active Memberships:

1996–present Society for Neuroscience
2002–present Complex Trait Consortium
2003–present Research Society on Alcoholism
2003–present International Behavioral and Neurogenetics Society (IBANGS)
2009–present International Society of Computational Biology

Dissertation Committee Memberships:

Bhavesht Borate, Genome Science and Technology Program, Oak Ridge National Laboratory and University of Tennessee, Knoxville, TN, Present position: Applied Statistics, Fred Hutchinson Cancer Research Center

Leslie Jellen, Department of Psychology, Pennsylvania State University, Happy Valley, PA
Yun Zhang, Computer Science Department, University of Tennessee, Knoxville, TN, Present position: Pioneer Hybrids
Vivek Philip, Genome Science and Technology Program, Oak Ridge National Laboratory and University of Tennessee, Knoxville, TN, Major advisor, Present Position, Computational Science Service, The Jackson Laboratory.
Joshua R. New, Computer Science Department, University of Tennessee, Knoxville, TN, Present Position, Staff Scientist, Building Technologies Research and Integration Center, ORNL.
Jeremy Jay, Electrical Engineering and Computer Science, University of Maine, Orono, ME, Present position Department of Bioinformatics and Genomics, UNC Charlotte.
Suman Duvurru, Genome Science and Technology Program, Oak Ridge National Laboratory and University of Tennessee, Knoxville, TN, Research Scientist, Eli Lilly

Post-Doctoral Trainees:

Dr. Roumyana Kirova, 2005–2006. Present Position: Senior Staff Scientist, Bristol-Myers, Princeton, NJ
Dr. Ryan Logan, 2011–2012. Present Position: Post-doctoral Research, University of Pittsburgh
Dr. Juliet Ndukum, 2012-present
Dr. Price Dickson, 2012-present

High School/Undergrad Trainees:

2007-2008 Sarah Jo Jenkins, MS, Austin Peay State University, present Research Assistant, Vanderbilt University
2008-2009 Boloye Gomero, MS, Maryville College, present University of Tennessee Mathematics Department
2010 Amanda Ackovitz, North Carolina School of Science and Mathematics
2010 Ashley Hunt, The Maine School of Science and Mathematics
2011 Avner Maiberg, University of Maine
2011 Carter Hardwood, The Groton School, Groton, MA
2011 Lillian Kang, North Carolina School of Science and Mathematics, present Duke University
2012 David Wang, North Carolina School of Science and Mathematics.
2012 Eleanora Hubbell, Mount Desert Island High School.
2012 Axis Fuksman-Kumpa, Mount Desert Island High School.
2012-present Andrew Gallup, Mount Desert Island High School
2012-present Casey Acklin, College of the Atlantic, Bar Harbor, ME
2012-present Courtney Vaughn, University of North Carolina Chapel Hill
2012-2013 Katie Long, University of Michigan
2012 Joshua Higgins, Baylor University
2013-2014 Billy Ferm, The University of Maine, Orono, ME
2014 Catherine Toal, Bronxville Public High School, Bronxville, NY
2014 Astrid Moore, Colby College, Waterville, ME
2014 Lingfeng Hou, Tsinghua University, Beijing, China

Teaching:

Courses:

8/96–12/97 Behavioral Science for Medical Students, University of Illinois at Urbana-Champaign, Teaching Assistant, Dept. of Psychology and College of Medicine
8/98–12/98 Gross Anatomy for Medical Students, University of Illinois at Urbana-Champaign, Teaching Assistant, College of Medicine
1/97–5/00 The Brain and the Mind, University of Illinois at Urbana-Champaign, Teaching Assistant, Dept. of Psychology
8/00–12/00 Psychopharmacology, University of Illinois at Urbana-Champaign, Teaching Assistant, Dept. of Psychology
8/06–5/09 Genome Science and Technology I-II, University of Tennessee, Lecturer, Complex Trait Analysis

Short Courses and Guest Lectures:

11/02 Society for Neuroscience Annual Meeting, Orlando, Florida, Teaching Assistant—Bioinformatics Short Course; Session on Microarray Analysis
6/03 The Memphis Microarray Short Course and Feinstein Symposium Organizing Committee, Faculty, Microarray Data Analysis
11/03 Society for Neuroscience Annual Meeting, New Orleans, Louisiana
Faculty— The Bioinformatics of Brains: From Genes and Proteins to Behaviors
Session on Microarray Analysis
5/04 NIMH Workshop on Experimental Neurogenetics of the Mouse, Memphis, TN
Faculty, Gene-Environment Interactions
8/04 IBANGS 10th International Summer School in Neurobehavioral Genetics, Memphis, TN

Faculty, Genetics of Gene Expression, WebQTL
 9/04 The Jackson Laboratory Short Course on Mathematical Approaches to Complex Phenotypes, Bar Harbor, ME. Faculty, Genetics of Gene Expression, WebQTL
 5/05 NIMH Workshop on Experimental Neurogenetics of the Mouse, Memphis, TN
 Faculty, Gene-Environment Interactions
 7/05 IBANGS 11th International Summer School in Neurobehavioral Genetics, Bordeaux, France
 Faculty, Bioinformatics, WebQTL
 9/05 IBANGS 12th International Summer School in Neurobehavioral Genetics, Moscow, Russia
 Faculty, Molecular Biology From QTL to Gene, Systems Genetics, WebQTL
 10/05 The Jackson Laboratory Short Course on Complex Trait Analysis, Bar Harbor, ME
 Faculty, Genetics of Gene Expression, WebQTL
 11/05 International Mouse Genome Consortium Bioinformatic Tutorials, Strasbourg, France, WebQTL
 5/06 GeneNetwork and WebQTL tutorial: An on-line systems genetics pilot project. Complex Trait Consortium, Chapel Hill, NC
 5/06 NIMH Workshop on Experimental Neurogenetics of the Mouse, Memphis, TN
 Faculty, Gene-Environment Interactions
 10/06 The Jackson Laboratory Short Course on Complex Trait Analysis, Bar Harbor, ME
 Faculty, Genetics of Gene Expression, WebQTL
 11/06 International Mouse Genome Consortium Bioinformatic Tutorials, Charleston, SC, WebQTL
 10/07 The Jackson Laboratory Short Course on Complex Trait Analysis, Bar Harbor, ME
 Faculty, Genetics of Gene Expression, WebQTL
 10/08 The Jackson Laboratory Short Course on Complex Trait Analysis, Bar Harbor, ME
 Faculty, Genetics of Gene Expression, WebQTL
 10/09 The Jackson Laboratory Short Course on Complex Trait Analysis, Bar Harbor, ME
 Faculty, Genetics of Gene Expression, WebQTL
 8/10 The Jackson Laboratory Short Course on the Genetics of Addiction, Bar Harbor, ME. Course Organizer
 10/10 The Jackson Laboratory Short Course on Complex Trait Analysis, Bar Harbor, ME
 Faculty, Ontological Discovery Environment
 8/11 The Jackson Laboratory Short Course on the Genetics of Addiction, Bar Harbor, ME. Course Organizer
 9/11 The Jackson Laboratory Short Course on the Genomic and Proteomic Approaches to Complex Heart, Lung, Blood & Sleep Disorders, Bar Harbor, ME
 10/11 The Jackson Laboratory Short Course on Complex Trait Analysis, Bar Harbor, ME
 Faculty, GeneWeaver
 8/12 Short Course on the Genetics of Addiction, Bar Harbor, ME. Course Organizer
 10/12 The Jackson Laboratory Short Course on Systems Genetics, Bar Harbor, ME
 Faculty, GeneWeaver
 8/13 Short Course on the Genetics of Addiction, Bar Harbor, ME. Course Organizer
 9/13 The Jackson Laboratory Short Course on Systems Genetics, Bar Harbor, ME
 Faculty, GeneWeaver
 7/14 The Jackson Laboratory Short Course on Medical and Experimental Mammalian Genetics, Bar Harbor, ME
 Faculty, Modeling Behavior in the Laboratory Mouse
 8/14 Short Course on the Genetics of Addiction, Bar Harbor, ME. Course Organizer
 9/14 The Jackson Laboratory Short Course on Systems Genetics, Bar Harbor, ME
 Faculty, GeneWeaver

Invited Talks and Symposia:

9/30/03 “Genetic Interactions with the Laboratory Environment” The Neuroscience Institute Neuroscience Seminar Series, University of Tennessee Health Science Center, Memphis TN. Host: Dr. Robyn Wallace
 10/20/03 “Genetic modulation of gene expression and correlations with neurobehavioral traits” Behavioral Neuroscience Seminar, Department of Psychology, University of Connecticut, Storrs, CT. Host: Dr. Steve Maxson
 3/3/04 “Relational genetics from base pair to behavior in WebQTL: Genetic analysis of gene transcription regulation and correlations with neurobehavioral phenotypes” Neuroscience Program Seminar, University of Illinois at Urbana-Champaign, Urbana, IL. Hosts: Graham Huesmann and Dr. David Clayton
 6/27/04 “WebQTL: A resource for analysis of gene expression variation and the genetic dissection of alcohol related phenotypes” in “Complex Genetics of Interactions of Alcohol and CNS Function and Behavior. Research Society on Alcoholism, Vancouver, BC, Canada. Organizers: Robert W. Williams and Douglas Matthews. Chair: Michael F. Miles
 8/23/04 “WebQTL: Genetics of Individual Differences in Gene Expression, Brain, and Behavior in the Mouse CNS.” Oak Ridge National Laboratory, Oak Ridge, TN. Host: Dr. Dabney Johnson

- 8/28/04 "From Base Pair to Behavior: Use of Genetic Reference Populations for Genome-wide Analysis of Gene Expression and Systems Level Phenotypes," CBI Seminar, Oak Ridge National Laboratory, Oak Ridge, TN. Host: Dr. Jay R. Snoddy
- 10/1/04 University of Pittsburgh Medical College. Host: Dr. William R. Lariviere
- 10/4/04 "WebQTL demonstration workshop," Penn State University, State College, PA. Host: Dr. Byron C. Jones
- 10/11/04 "WebQTL: Genetics of individual differences in gene expression, brain and behavior," Southern Illinois University, Springfield, IL. Host: Dr. Linda C. Toth
- 10/24/04 "Internet based genetic analysis from base-pair to behavior in inbred mice" in "Neurogenomics of Behavior," Society for Neuroscience, San Diego, CA. Organizer and Chair: Dr. David Clayton
- 11/15/04 "WebQTL Tutorial," Wake Forest University, Winston-Salem, NC. Host: Dr. Sara Jones
- 2/24/05 "From Base Pair to Behavior: Use of Genetic Reference Populations for Genome-wide Analysis of Gene Expression and Systems Level Phenotypes," Virginia Institute for Psychiatric and Behavioral Genetics, Department of Pharmacology and Toxicology. Hosts: Dr. Kenneth Kendler and Dr. William Martin
- 7/29/05 WebQTL: Internet based genetic analysis from base-pair to behavior in inbred mice. Antwerp, Belgium. Hosts: Dr. Frank Kooy and Vanessa Errygers
- 10/24/05 "Systems Genetics: Building Gene to Phenotype Networks for Pain," Wyeth Pharmaceuticals, Princeton, NJ. Host: Dr. Philip Jones
- 11/16/05 NCBI, Bethesda, MD. Host: Dr. Teresa Przytych
- 11/18/05 "Fundamentals of Genomics in the Study of Pain," Special Session on Genomics and Pain, American Society of Regional Anesthesia and Pain Medicine Annual Fall Pain Meeting and Workshops. Miami, FL. Organizer and Chair: Dr. Sunil Panchal
- 2/15/06 "Gene to phenotype networks for brain and behavior," Gordon Research Conference on Genes and Behavior, Ventura, CA. Chairperson: Dr. Robert Hitzeman; Session Chairs: Dr. Tamara Phillips and Dr. Eric Schadt
- 3/27/06 "Extracting biological networks from basepair to behavior," Center for Alcohol Studies, University of North Carolina, NC. Host: Dr. Fulton Crews
- 6/27/06 "What can microarrays tell us about alcoholism that we don't already know and how can we extract this information?" Research Society on Alcoholism, Workshop organizer
- 9/25/06 "Systems Genetics: the Systems Biology of Populations," University of Chicago Department of Genetics, Chicago, IL. Host: Justin Borevitz
- 9/29/06 "The Collaborative Cross at ORNL: Progress and Applications," Keynote Workshop on Complex Traits as Human Diseases, Oak Ridge National Laboratory, TN. Organizer: Dr. Brynn Voy
- 10/14/06 "Integrative bioinformatics for neurobehavioral genetics," at "Meet the Experts," Society for Neuroscience, Atlanta, GA.
- 11/28/06 "Systems Neurogenetics: Systems Biology of Populations for Brain and Behavior," Neuroscience Program, University of Illinois-at Urbana Champaign, IL. Host: Justin Rhodes
- 12/7/06 "Rapid Compilation of Neurobiological Networks from Basepair to Behavior," American College of Neuropsychopharmacology Annual Meeting, Hollywood, FL. Chairpersons: Dr. Adron Harris and Dr. Igor Ponomarov
- 1/26/07 "Interactions of the Laboratory Environment with Mouse Behavior," Appalachian Branch AALAS Winter Quarter Meeting, Knoxville, TN. Chairperson: Lee Barnett, Bionetics Corporation
- 2/19/07 "The collaborative cross at ORNL: a community resource for systems genetics" Gordon Research Conference in Quantitative Genetics and Genomics, Ventura, CA. Session Chairs: Dr. David Threadgill and Dr. Daniel Pomp
- 3/19/07 "Ontological Discovery from Genes to Behavior," Portland Alcohol Research Center, Oregon Health Sciences University, Portland Oregon. Host: Dr. Robert Hitzemann
- 3/21/07 "Systems Genetics, the systems biology of populations" Institute for Systems Biology, Seattle, WA. Host: Dr. David Galas
- 5/21/07 "Ontological Discovery from Genes to Behavior," Young Investigator Awardee Lecture, International Behavioral and Neurogenetics Society, Doorwerth, the Netherlands
- 5/25/07 "Current Status and Prospects of Collaborative Cross: The Collaborative Cross at ORNL," Workshop at the Complex Trait Consortium Annual Meeting, Braunschweig, Germany
- 5/30/07 "The Collaborative Cross a reference population for the systems genetic analysis of addiction," NIH/NIDA Workshop on Addiction, Microarrays and Gene Discovery. Organizers: Dr. Jonathan Pollock and Dr. John Satterlee
- 6/15/07 "Using genetics and genomics to understand relations among anxiety-like behaviors and other traits," International Behavioral Neuroscience Society. Symposium. Organizer: Dr. Abraham Palmer
- 11/5/07 "1000 Mixed-up Mice: Behavioral Phenotyping in the Collaborative Cross—a large population of unprecedented genetic diversity," in speeding up behavioral testing of rodents and zebrafish: high-throughput solutions, challenges, and perspectives. Noldus Information Technology Satellite Symposium, Society for Neuroscience annual meeting 2007. Sponsoring SFN member: Dr. Robert Gerlai

- 6/3/08 "Comparison of linkage disequilibrium networks in genetic reference populations," Complex Trait Consortium Meeting, Montreal, QC .
- 6/8/09 "Multivariate genetic analysis for the functional genomics of behavior" International Behavioral and Neurogenetics Society, Dresden, Germany. Symposium Chair: Leo Schalkwyk
- 6/09 "Multidimensional trait assays for genetic prediction of alcohol addiction: Multidimensional analysis of mouse behavior for genetic analysis," Symposium organizer, speaker
- 5/5/09 "Extracting and validating gene-phenotype association networks using the ontological discovery environment," Complex Trait Consortium, Manchester UK.
- 5/13/10 "Behavior genetic analysis in the collaborative cross," International Behavioral and Neural Genetics Society. Symposium Chair.
- 6/26/10 "A Computational System for Integrative Genomics," NIAAA Satellite Symposium: A Systems Biology Approach to Understanding the Effects of Alcohol on the Brain. San Antonio, TX.
- 7/8/10 "The Ontological Discovery Environment: Points to Consider When Populating and Using a Virtual Environment for the Application of High-Performance Computing to Discover Phenotypes Through Integrating Gene Sets Across Species, Tissue and Experimental Platform," NIDA Workshop: Informatics for Data and Resource Discovery, Rockville, MD.
- 10/4/10 "Discovering the organization of behavioral traits using integrative genetics and genomics," Harvard University: Host Dr. Clifford Woolf
- 11/12/10 "Systems genetics for identification of addiction-related genes using high-throughput behavioral phenotyping," NIDA Frontiers in Addiction Research Mini-Convention: Organizer John Satterlee
- 11/18/10 "Integrative Genetics and Genomics for Pain Research," Amgen, Thousand Oaks, CA. Host: Sonya Lehto
- 4/23/10 "Identification of addiction related genes using integrative genetics and genomics," National Institute on Drug Abuse, Webinar
- 5/19/11 "Target Identification Strategies in the Genomic Era," APS 30th Annual Meeting, Austin, TX. Organizer: Luda Diatchenko
- 6/28/11 "Integrative Genomics of Alcohol Use and Alcohol Response: Finding Convergent Evidence Across Species and Experimental Systems," RSA 34th Annual Meeting. Chairs: Mary-Anne Enoch and David Goldman
- 3/18/12 Gordon Research Seminar: Genes and Behavior, Discussant. Galveston, TX.
- 3/30/12 Plenary Speaker, "Accelerating discovery in behavioral genetics through integrative genetics and genomics." KBRIN Bioinformatics Summit 2012, Louisville, KY.
- 9/9/12 Symposium Organizer and Speaker "Cross Species Integrative Functional Genomics of Alcohol Related Behaviors in The Gene Weaver Web based Software System" in the "Neurogenomics of Alcoholism" Symposium, 16th Congress of International Society for Biomedical Research on Alcoholism, Sapporo, Japan.
- 11/12 Department of Psychiatry, UConn Health Center, Host: Victor Hesselbock
- 4/15/13 Human Genome Meeting and 21st International Congress on Genetics, "High Precision Systems Genetic Analysis of Behavior in Advanced Mouse Populations" Invited speaker. Singapore.
- 11/25/13 NIDA Genetics Consortium Meeting, "Model Organism Genetics" Invited Speaker.
- 2/25/14 Washington University School of Medicine, Invited Speaker. Host: Pamela Madden
- 2/28/14 University of Tennessee – Heath Science Center, Invited Speaker, Host: Robert Williams
- 3/28/14 UConn, Storrs, CT - Brain and Cognitive Sciences Meeting
- 6/4/14 NIDA Genetics Consortium Meeting, "Mouse Genetic Technologies" Invited Speaker.
- 11/7/14 Genzyme Corporation, "Geneweaver" Seminar, Invited Speaker. Host: Mindy Zhang

Extramural Research Support:

Active:

5 U54 HG006332-04 Braun, Svenson (PI) 09/16/11-07/31/16

NIH/NHGRI

The Jackson Laboratory KOMP2 Phenotyping Center

The Knockout Mouse Phenotyping Program (KOMP2) seeks to build a phenotype resource summarizing the function of 20,000 genes in the mouse and to ultimately create a resource for understanding gene function in humans. The Jackson Laboratory will contribute to this goal by efficiently generating and sharing functional data for 833 mouse genes and will enhance the value of these data by linking them with current genetic and biological knowledge, enabling the scientific community to discover the roles of these genes in human health and disease.

Role: Co-Investigator

5 P30 AG038070-05 Churchill (PI) 08/15/10-06/30/15

NIH/NIA

The Jackson Laboratory Nathan Shock Center of Excellence in the Basic Biology of Aging - Core 4: Healthspan Core

The Healthspan Core will: a) provide affordable phenotyping of aging mice by a variety of techniques using defined protocols; b) provide genotypic data for these resources to allow researchers to map genetic and phenotypic associations

with aging in the mouse; and c) collect and store valuable tissues from CC strains for distribution to internal and external researchers for further pathology and biochemical studies.

Role: Core Leader

5 R01 AA018776-04 Chesler (PI)

09/25/10-08/31/15

NIH/NIAAA

Data Structures, Algorithms and Tools for Ontological Discovery

The aims of this project are: 1) to develop a large data repository for gene-set centered results in behavioral neuroscience as well as data structures that enable the use of databases to represent graphical network data; 2) to develop algorithms for the analysis of integrated gene set centered data across species and experimental platforms to incorporate these developments into a Web based software system; and 3) to use this tool to find genes underlying relationships between multiple abused substances and behavior.

Role: Principal Investigator

2 R13 DA032192-04 Chesler (PI)

07/01/14-06/30/17

NIH/NIDA

Workshop on the Genetics of Addiction

The goal of the annual workshop on the Genetics of Addiction is to provide students an opportunity to learn about genetic applications and approaches to drug addiction research.

Role: Principal Investigator

5 P50 GM076468-09 Churchill (PI)

07/15/11-06/30/16

NIH/NIGMS

Center for Genome Dynamics - Project E: Data Driven Systems Genetics Workflow for New Experimental Platforms

The goal of this project is the development and application of high throughput RNA sequencing technology (HTPS) as the sole source of transcription and polymorphism data for an expression QTL experiment.

Role: Project Leader

TJL-DIF-FY14-EJC Chesler (PI)

06/01/14-12/31/14

The Jackson Laboratory Director's Innovation Fund

Workshop on Advanced Mouse Resources for Systems Neurogenetics of Addiction

The purpose of this funding is to organize a workshop to educate addiction researchers about resources and tools for advanced systems genetic analyses. The funding covers travel expenses for invited participants.

Role: Principal Investigator

Completed:

5 R01 AA018776-02 Chesler (PI)

9/25/10-8/31/14

NIH/NIAAA

Data Structures, Algorithms and Tools for Ontological Discovery

The aims of this project are: 1) to develop a large data repository for behavioral neuroscience and data structures that more efficiently enable the use of databases to represent graphical network data; 2) to develop algorithms for the analysis of integrated gene centered data across species and experimental platforms to incorporate these developments into a Web-based software system; and 3) to use this tool to find genes underlying relationships between multiple abused substances and behavior.

Role: Principal Investigator

5 R13 DA032192-03 Chesler (PI)

7/1/11-6/30/14

NIH/NIDA

Workshop on the Genetics of Addiction

The goal of the annual workshop on the Genetics of Addiction proposed in this application is to provide students an opportunity to learn about genetic applications and approaches to drug addiction research.

Role: Principal Investigator

5 R01 DA021198-05 Chesler (PI)

8/1/09-7/31/12

NIH/NIDA

Genetics of Neuropathic and Inflammatory Hypersensitivity

The goal of this project is to determine novel genetic mechanisms of chronic neuropathic and inflammatory pain for predisposition assessment and treatment development. Dr. Chesler's role is to provide bioinformatics support to the project.

Role: Consortium PI

5 U01 AA016662-05 Miles (PI) 2/1/10-1/31/12
NIH/NIAAA
INIA-Stress: Information and Analysis Core
This project focuses on statistical analysis and web tools for data integration across methodologically diverse alcoholism research. This funding primary supports alcoholism specific application and database population for the ODE project.
Role: Consortium PI

5 P50 GM076468-05 Churchill (PI) 4/1/06-3/31/12
NIH/NIGMS
Genome Dynamics: Evolution, Organization and Function - Core 2 Subproject 2 (Chesler)
The goal of this subproject is to develop methods of extracting genotype and genetic map information from RNA-seq data for systems genetic analyses from a single source of molecular data in complex populations.
Role: Co-Core Leader

1 R13 DA030036-01 Chesler (PI) 7/1/10-6/30/11
NIH/NIDA
Genetics of Drug Addiction
The short course on the Genetics of Addiction proposed in this application will provide students with an opportunity to learn about genetic applications and approaches to drug addiction research.
Role: Principal Investigator

7 U01 AA016669-04 Chesler (PI) 11/25/10-1/31/11
NIH/NIAAA
Ontological Discovery for Ethanol Research (INIA Project)
This funding supports development of a web based software system for integration of ethanol related gene sets and develops methods to analyze the sets and their relationship to behavior using graph algorithms. This funding specifically supports the database and tool development.
Role: Principal Investigator

DOE ERKP 804 (Chesler) 10/1/06 – 9/30/09
DOE/Office of Science
Mouse Genetics and Mutagenesis for Functional Genomics
This funding provided the majority of the support for the develop and characterization of the Collaborative Cross reference population, and included support for the genotyping and gene expression lab, behavioral, physiological and morphological phenotyping labs, bioinformatics and biostatistics, breeding operations and Mouse Genetics Research Facility in the Systems Genetics Group at ORNL. External advisors: David Galas, Lisa Stubbs, Rick Woychik, Rudi Balling, Miriam Meisler, Randy Blakely, David Threadgill, John E. French, Robert Ullrich.
Role: Principal Investigator

Ellison Medical Foundation (Chesler) 2/2/06 – 1/10/10
A Genetic Reference Panel for the Systematic Analysis of Lifetime Factors that Alter Lifespan and Quality of Life
This funding, initially issued to DK Johnson, supported initiation and breeding of 500 lines of the Collaborative Cross. Dr. Chesler served as PI of this project from 7/2006-7/2009.
Role: Principle Investigator

ORNL Laboratory Directors Research and Development Fund (Chesler) 10/1/07 – 9/30/09
This funding supports genetic analysis of microbial-host interactions in the Collaborative Cross including high throughput sequencing of the gut microbiome using 454, genome wide transcriptional profiling of the surrounding mouse intestine and SNP genotypes in collaborative cross mice and their progenitor strains.
Role: Principle Investigator

NIH/NIDA, NIAAA 5R01DA020677 (Goldowitz)
7/1/06- 6/30/09
Gene to Phenotype Networks for Alcohol and Drug Addiction
This project supported the characterization of the newly expanded BXD Recombinant Inbred strain panel on over 250 behavioral phenotypes using the Tennessee Mouse Genome Consortium's behavioral phenotyping labs. Dr. Chesler conceived of the project, devised and implemented analysis tools and data management procedures, collected pain related phenotypes, and led the preparation of manuscripts.
Role: Co-Investigator

NIH/NIMH 5 U01 MH61971-05 (Goldowitz) 9/2/00 – 8/31/06

Targeted Mutagenesis of the Mouse Genome and Neural Phenotypes

This funding supports the production and phenotyping of potentially mutant mice to identify mutant mice that serve as models to study human disease.

Role: Collaborator and biostatistician

NIH/NIAAA 5 U01AA013512-05 (Grant/Chesler)

8/1/05 – 12/31/06

The Integrative Neurosciences Initiative on Alcoholism (INIA): Informatics

This funding supports the statistical analysis and design of web tools for creation of data integration across methodologically diverse behavioral neuroscience research in the context of the INIA.

Role: Co-Investigator

NIH/NIAAA U01 AA13641-05 (Langston/Chesler)

1/1/06 – 12/31/06

Combinatorial Network Analysis of High Throughput Stress and Alcohol Data

INIA pilot project to apply the combinatorial algorithms to analysis of data related to stress and alcoholism.

Role: Pilot Principal Investigator

D06 -033 (Voy)

10/1/05

– 9/30/07

ORNL Laboratory Directed Research and Development Funds (LDRD)

A Model System for Analyzing Whole-body Toxicity of TICs, TIMs, and Chemical Warfare Agents

Impact of genetic diversity on response to toxic chemicals in mice.

This funding initially supported toxicology studies in the BXD Recombinant Inbred Strains, and was redirected to the development of a genotyping array for the Collaborative Cross.

Role: Co-PI

S08-009 (Chesler)

10/1/07 – 9/30/08

ORNL Laboratory Directed Research and Systems Neurogenetics of Methyl Mercury Exposure

This project investigates the effects of genetic variability on the neurobehavioral and transcriptional response to an important environmental contaminant, Methyl Mercury.

Role: Principle Investigator

NIH/NICHD 1 R01 HD052472-05 (Hamre)

9/5/05 – 6/30/10

Mapping Cerebellar Development in Time and Space

This project examines developmental cerebella gene expression in mouse models including BXD RI lines. Dr. Chesler's lab provided time series analysis of mutant and BXD gene expression data through development and assisted in the design of databases and web resources for this project.

Role: Co-PI

ORNL Technology Transfer and Economic Development (TTED) Royalty Funds (Chesler)

5/15/06

Combination High Throughput Genotyping and Expression Analysis Equipment for Mammalian Systems Genetic Analysis

This equipment grant supported the purchase of an Illumina Infinium Beadstation for Dr. Chesler's group for gene expression genetics and genotyping of the Collaborative Cross.

Inactive due to relocation

NIH/NCRR 5 U01 CA134240 (Threadgill)

9/30/07 – 9/29/12

Systems Genetics Resource Consortium

This funding supports the distribution of the collaborative cross lines for profiling. Originally developed as a P30 resource core at ORNL led by Dr. Chesler, this funding supported the provision of mice to UNC Chapel Hill for the Pre-CC proof of concept study.

NIAAA 1R01 AA014425-01A1 (Lu)

4/1/04 – 3/31/09

Genetic Analysis of Ethanol-mediated Stress Reduction

The major goal of this proposal is to extend transcriptome QTL mapping and trait association in RI strains to the hippocampus of the LXS mice under alcohol and stress exposure to test the role of shared genetic mediation of responses to both treatments. Dr. Chesler developed major aspects of this proposal and the methods used to execute the project.

Role: Co-Investigator

NSF IGERT (Peterson)

8/08-8/13

SCALE-IT:

This is a grant to develop a graduate program and curriculum in high-performance computing applications in the biological sciences including systems genetics.

Role: Co-Investigator

NOTES:

*Laboratory Director's Research and Development Funds are awarded annually on a competitive basis within the Oak Ridge National Laboratory. Applications are reviewed by a committee including external peer reviewers, lab scientific staff and management. Funding of up to \$350,000 per year over a two-year period is awarded.

**ORNL Seed Money Funds are awarded on a competitive basis based on an internal review by Lab scientific staff.

***DOE funding is awarded via the Office of Biological and Environmental Research, Office of Science, US. Department of Energy, requiring annual peer reviewed Field Work Proposal. An external advisory board reviewed progress and directions on the Mouse Genetics Research Facility supported by these funds.

****ORNL Technology Transfer and Economic Development (TTED) Royalty Funds are awarded based on a competitive internal review by a committee consisting of the Director of Technology Transfer and Economic Development and three of the five Associate Lab Directors at ORNL.

Publications:

Review and Commentary:

1. Lariviere WR, **Chesler EJ**, Mogil JS. 2001. Transgenic studies of pain and analgesia: mutation or background genotype? *Journal of Pharmacology and Experimental Therapeutics*, 297:467-73.
2. **Chesler EJ**, Rodriguez-Zas SL, Mogil JS. 2001. In Silico Mapping of Mouse Quantitative Trait Loci. *Science*, 294:2423.
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5. **Chesler EJ**, Bystrykh L, de Haan G, Cooke MP, Su A, Manly KF, Williams RW. 2006. Reply to "Normalization procedures and detection of linkage signal in genetical-genomics experiments". *Nat Genet* 38(8):856-8.
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7. The Mouse Phenotype Database Integration Consortium: Hancock JM, Adams NC, Aidinis V, Blake A, Blake JA, Bogue M, Brown SDM, **Chesler E**, Davidson D, Duran C, Eppig JT, Gailus-Durner V, Gates H, Gkoutos GV, Greenaway S, Hrabe' De Angelis M, Kollias, Leblanc GS, Lee K, Lengger C, Maier H, Mallon A-M, Masuya H, Melvin DG, Muller W, Parkinson H, Proctor G, Reuveni E, Schofield P, Shukla A, Smith C, Toyoda T, Vasseur L, Wakana S, Walling A, White J, Wood J, Zouberakis M. 2007. Integration of mouse phenome data resources. *Mammalian Genome*, 2007 Mar;18(3):157-63.

8. **Chesler EJ** (2013) Out of the bottleneck: The Diversity Outcross and Collaborative Cross Mouse populations in Behavioral Genetics Research. Invited Review Mammalian Genome Special Issue

Research Papers:

1. **Chesler EJ**, Salamone JD. 1996. Effects of acute and repeated clozapine injections on cholinomimetic induced vacuous jaw movements. *Pharmacol Biochem Behav* 54(3):619-624.
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9. Mogil JS, Wilson SG, **Chesler EJ**, Rankin AL, Nemmani KV, Lariviere WR, Groce MK, Wallace MR, Kaplan L, Staud R, Ness TJ, Glover TL, Stankova M, Mayorov A, Hrubby VJ, Grisel JE, Fillingim RB. 2003. The melanocortin-1 receptor gene mediates female-specific mechanisms of analgesia in mice and humans. *Proc Natl Acad Sci USA* 100(8):4867-4872. PMC153647
10. Peirce JL, **Chesler EJ**, Williams RW, Lu L. 2003. Genetic architecture of the mouse hippocampus: identification of gene loci with selective regional effects. *Genes Brain Behav* 2(4):238-252.
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Internet Resources:

- WebQTL/GeneNetwork. www.webqtl.org, www.genenetwork.org Design of tools for multi-trait and genetic correlation analysis including Cluster Map, Associative Network, Genetic Correlation and Principal Component Analysis.
- Mutrack/MouseTrack. www.tnmouse.org; <http://mouse.ornl.gov> Design of robust methods for mutant detection, mutant comparison analysis and tools for complex trait analysis for the Tennessee Mouse Genome Consortium and Integrative Neuroscience Initiative on Alcoholism.
- GeneWeaver <http://geneweaver.org> formerly the Ontological Discovery Environment. <http://ontologicaldiscovery.org> Combinatorial analysis of user submitted and curated experimental results in functional genomics.