

CURRICULUM VITAE

Keith R. Shockley, Ph.D.

Citizenship

United States of America

Address

Biostatistics and Computational Biology Branch, NIEHS
P.O. Box 12233
Mail Drop A3-03
Research Triangle Park, NC 27709

Phone

984-287-3698

Email

shockleykr@niehs.nih.gov

Education

- 1998 B.S. Chemical Engineering, New Mexico State University
Minors: Biochemistry and Chemistry
- 2000 M.S. Chemical Engineering, North Carolina State University
Minor: Biotechnology
- 2004 Ph.D. Chemical Engineering, North Carolina State University

Professional Experience

1996	Summer Intern	The Dow Chemical Company (Texas Operations)
1997	NSF REU Student Intern	Colorado State University
1998-2000	Teaching Assistant	North Carolina State University
1999-2004	Research Assistant	North Carolina State University
2004-2008	Postdoctoral Associate	The Jackson Laboratory
2008-present	Staff Scientist	Biostatistics and Computational Biology Branch (formerly, Biostatistics Branch), NIEHS
2008-present	Adjunct Member	Biomolecular Screening Branch, NIEHS
2008-2011	Adjunct Member	Host Susceptibility Branch, NIEHS
2018-present	Principal Statistician for the National Toxicology Program	
2019-present	Alternate COR, NIEHS Statistical Support Services contract	

Contracting Officer's Representative Certification

Federal Acquisition Certification for Contracting Officer's Representative (Level I), 2017
Federal Acquisition Certification for Contracting Officer's Representative (Level II), 2018
FAC-COR recertified (Level II), 2020

Honors and Notable Achievements

President's Associates Scholarship, NMSU, 1993-1997

Donald B. Summers Award, Department of Chemistry and Biochemistry, NMSU, 1994

Michael Snedar Award, College of Engineering, NMSU, 1995

AICHE 1995-96 Donald F. Othmer Award, American Institute of Chemical Engineers, 1996

Dow Outstanding Junior Award, The Dow Chemical Company, 1997

First Place in 1998 NMSU Senior Design Project Contest, Department of Chemical Engineering, NMSU, 1998

Dean's Fellowship Award, NCSU, 1999

Graduate Assistance in Areas of National Need (GAANN) Fellowship, 1998-2001

GAANN mini-grant for PTC-100 thermal cyler, 2000

First runner-up in 2001 NCSU Schoenborn poster competition, Department of Chemical Engineering, NCSU, 2001

Second place for outstanding oral presentation in the 15th Annual Meeting of the Mid-Atlantic Biochemical Engineering Consortium, 2002

Biochemical Engineering (XIII) conference travel grant, 2003

Second place for outstanding presentation at 2003 NCSU Schoenborn oral presentation competition, Department of Chemical Engineering, NCSU, 2003

F32 Ruth L. Kirschstein fellowship award for grant proposal entitled "ANOVA-Based Approaches to Time-Series Microarray Data", NIH/NHGRI, 2005-2008

NIEHS Director's One-NIEHS Award for pioneering work related to developing statistical methods for application to high throughput screening in the NTP, NIEHS, 2012

NIH Director's Group Award given in recognition of the "extraordinary vision, effort, creativity, and scientific leadership" shown during the implementation of this interagency effort as a member of the Tox21 Team, NIH, 2014

NIEHS Merit Award for "leadership in executing the Biostatistics and Bioinformatics Short Courses" as a member of the Biostatistics and Bioinformatics Short Courses Team, NIEHS, 2020

Journal Referee/Reviewer

Applied Biochemistry and Biotechnology; Biometrics; BMC Genomics; Chemo-Biological Interactions; Chemometrics and Intelligent Laboratory Systems; Encyclopedia of Industrial Biology; Frontiers in Environmental Science; Frontiers in Genetics; International Journal of Obesity; Journal of Applied Genetics; OMICS; PLoS ONE; Physiological Genomics; Statistical Applications in Genetics and Molecular Biology; Toxicologic Pathology; Toxicological Sciences

Research Interests

applied linear and nonlinear modeling, bioinformatics, computational biology, complex trait analysis, functional genomics, high dimensional data analysis, high throughput screening, information theory, large-scale toxicity testing, multifactorial gene expression analysis, predictive toxicology, quantitative high throughput screening, toxicogenomics, toxicology

Professional Development

NCSU Biotechnology Program cDNA Microarray Workshop, NCSU, 2002
45th Annual Short Course in Medical and Experimental Mammalian Genetics, TJL, 2004
Short Course on Mathematical Approaches to the Analysis of Complex Phenotypes, TJL, 2004
Short Course on Gene Microarray Development and Analysis: Approaches to Complex Heart, Lung, Blood and Sleep Disorders, TJL, 2004
Short Course on Complex Trait Analysis, TJL, 2005-2007
Short Course on Systems Genetics, TJL, 2008
BCBB Genetics/Bioinformatics Interest Group, NIEHS, 2008-present
2nd Inter-Agency Computational Toxicology Colloquium, NCTR, 2008
Computational Toxicology Workshop, NAS, 2009
ToxCast Data Analysis Summit, EPA, 2009
Advancing Research on Mixtures Workshop, NIEHS, 2011
BSB Journal Club, NIEHS, 2011-2016
Environmental Genomics Short Course, MDIBL, 2011
NIEHS Genomics Day, NIEHS, 2011, 2012, 2017
Evidence-based Toxicology for the 21st Century: Opportunities and Challenges, EBTC, 2012
Workshop on Big Data and Toxicogenomics, NCBC, 2014
Second ToxCast Data Summit, EPA, 2014
Research Data Science Training, NIEHS, 2015
Population-based Rodent Resources for Environmental Health Sciences Meeting, NIEHS, 2015
Intro to Basic COR, NIH Training Center, 2017

Service within the NIEHS

Consultant, Biostatistics and Bioinformatics Consulting Service
Contributor, NIEHS Bioinformatics E-Bulletin
Article 1 (2009), *Quantitative High Throughput Screening at the NTP*
Article 2 (2011), *Tox21 collaboration*
Invited panelist, NIEHS workshop *Advancing Research on Mixtures: New Perspectives and Approaches for Predicting Adverse Human Health Effects*, September 26-27, 2011
Member, Advisory Board for Chemical Effects in Biological Systems (CEBS)
Member, DIR Combined Federal Campaign Team (2018-2019)
Member and Reviewer, Committee on Promotions II
Member, High Throughput Screening (HTS) Faculty
Member, Predictive Toxicology and Disease Working Group
Member, Staff Scientist Search Committee, Laboratory of Molecular Carcinogenesis (2013)
Member, Staff Scientist Search Committee, Biostatistics and Computational Biol. Branch (2019)
Member, Technical Review Committee for Statistical Contracts
Member, Technical Evaluation Panel for Bioinformatics Support in DIR and DNTP

Member, Tox21 Bioinformatics Working Group (Co-chair 2008-2011)

Member and Reviewer, Toxicogenomics (TGMX) Faculty

Teaching

Guest lecture for NCSU Biotechnology Program cDNA Microarray Workshop, "*Regulation of Proteolysis in Hyperthermophiles*", NCSU, 2002

Guest lecture for Short Course on Gene Microarray Development & Analysis: Approaches to Heart, Lung, Blood and Sleep Disorders, "*Affymetrix arrays: Diagnostics and Analysis Tools*", TJL, 2004

Guest lecture for Short Course on Complex Trait Analysis, "*Introduction to R/maanova*", TJL, 2006

Guest lectures for Short Course on Experimental Tools in Model Systems of Translational Vision Research, "*Microarray Experiment Design and Analysis*", TJL, 2006

Faculty member and lecturer for advanced high school distance course "Independent Studies in Computational Biology", The Center for Genome Dynamics, TJL, 2006-2008

Guest lectures for short courses on Complex Trait Analysis (2007) and Systems Genetics (2008), "*Interpreting Gene Lists: Using GO Terms*", TJL, 2007 & 2008

Instructor, Introduction to Biostatistics and Bioinformatics Short Courses presented by members of the Integrative Bioinformatics Support Group and the Biostatistics and Computational Biology Branch, "qHTS Analysis" and "DNA Microarray Analysis", NIEHS, 2009-2018

Guest faculty member and lecturer for short course on *Environmental Genomics*, "*Introduction to the Statistical Analysis of Microarray Data*", "*Statistical Analysis of Microarray Data: Linear Modeling*" and "*Clustering DNA Microarray Data: Hierarchical Clustering*", Mount Desert Island Biological Laboratory, 2011

Guest speaker for BIT815D (Professional Development), NCSU, 2012

Guest lecture for BIO 592 (Computational Environmental Sciences and Toxicology), "*Quality Control of Tox21 Screening Data Using ANOVA-based Clustering*", NCSU, 2019

Mentoring

Research mentor for TJL Summer Student Program student Luis Zapata, TJL, 2006

Research mentor for TJL Summer Student Program student David Witmer, TJL, 2007

Co-mentor of NIEHS Summers of Discovery Program student Sawyer Bowman who won first place in the high school division of the poster competition, NIEHS, 2010

Co-mentor of NIEHS Summers of Discovery student and Special Volunteer Mitas Ray (high school student) who was a semifinalist for the Intel Science Talent Search competition based on his summer project, NIEHS, 2012-2014

Success coach and panelist for the Master Minds Nine program, NCSU, 2014

Supervisor of Special Volunteer Yan Zhang (M.S., Statistics), NIEHS, 2014-2016

Mentor of NIEHS Summer Internship Program student and Special Volunteer Akshay Sankar (undergraduate student, UNC), NIEHS, 2017-2018

Co-mentor of NIEHS Summer Internship Program student and Special Volunteer Alyssa Taylor (undergraduate student, Virginia Wesleyan University; graduate student North Carolina State University), 2019-present

Other Professional Activities

Editorial Board Member of *Frontiers in Toxicogenomics*, Review Editor, 2011-present

Technical Qualifications Board, EPA, 2016

Editorial Board Member of *Toxicologic Pathology*, 2018-present

Ad Hoc Panelist for FIFRA Scientific Advisory Panel to review EPA's "Proposed Guidelines for Efficacy Testing of Topically Applied Pesticides Used Against Certain Ectoparasitic Pests on Pets", 2019

Editorial Board Member of *Frontiers in Computational Toxicology and Informatics*, Review Editor, 2019-present

Member of Health and Environmental Sciences Institute (HESI) Juvenile Animal Clinical Pathology Reference Data Work Group, 2020-present

Contributor to High-throughput Discovery Science & Inquiry-based Case Studies for Today's Students: Research Coordination Network in Undergraduate Biology Education, 2020-present

Publications

Peer-Reviewed Journal Articles –

1. Chhabra SR, **Shockley KR**, Ward DE, Kelly RM. (2002). Regulation of endo-acting glycosyl hydrolases in the hyperthermophilic bacterium *Thermotoga maritima* grown on glucan- and mannan-based polysaccharides. *Appl. Environ. Microb.* 68:545-554. PMID: PMC126696.
2. Ward DE, **Shockley KR**, Chang LS, Levy RD, Michel JK, Connors SB, Kelly RM. (2002). Proteolysis in hyperthermophilic microorganisms. *Archaea.* 1:63-74. PMID: PMC2685542.
3. Chhabra SR, **Shockley KR**, Connors SB, Scott KL, Wolfinger RD, Kelly RM. (2003). Carbohydrate-induced differential gene expression patterns in the hyperthermophilic bacterium *Thermotoga maritima*. *J. Biol. Chem.* 278:7740-7752.
4. **Shockley KR**, Ward DE, Chhabra SR, Connors SB, Montero CI, Kelly RM. (2003). Heat shock response by the hyperthermophilic archaeon *Pyrococcus furiosus*. *Appl. Environ. Microb.* 69:2365-2371. PMID: PMC154833.
5. Gao J, Bauer MW, **Shockley KR**, Pysz MA, Kelly RM. (2003). Growth of hyperthermophilic archaeon *Pyrococcus furiosus* on chitin involves two family 18 chitinases. *Appl. Environ. Microb.* 69:3119-3128. PMID: PMC161489.
6. Montero CI, Connors SB, Johnson MR, Pysz MA, **Shockley KR**, Kelly RM. (2004). Microbial ecology of hydrothermal biotopes. *SPIE Proc. Ser.* 5163:171-178.
7. Pysz MA, Ward DE, **Shockley KR**, Connors SB, Kelly RM. (2004). Transcriptional analysis of dynamic heat-shock response by the hyperthermophilic bacterium *Thermotoga maritima*. *Extremophiles.* 8:209-217.
8. Johnson MR, Montero CI, Connors SB, **Shockley KR**, Pysz MA, Kelly RM. (2004). Functional genomics-based studies of the microbial ecology of hyperthermophilic microorganisms. *Biochem. Soc. T.* 32:188-192.
9. Pysz, MA, **Shockley KR**, Montero CI, Connors SB, Ward DE, Kelly RM. (2004). Transcriptional analysis of biofilm formation processes in the anaerobic, hyperthermophilic bacterium *Thermotoga maritima*. *Appl. Environ. Microb.* 70:6098-6112. PMID: PMC522082.
10. Johnson MR, Montero CI, Connors SB, **Shockley KR**, Bridger SL, Kelly RM. (2005). Population density-dependent regulation of exopolysaccharide formation in the hyperthermophilic bacterium *Thermotoga maritima*. *Mol. Microbiol.* 55:664-674.
11. **Shockley KR**, Scott KL, Pysz MA, Connors SB, Johnson MR, Montero CI, Wolfinger RD, Kelly RM. (2005). Genome-wide transcriptional variation within and between steady states for continuous growth of the hyperthermophile *Thermotoga maritima*. *Appl. Environ. Microb.* 71:5572-5576. PMID: PMC1214699.
12. Connors SB, Montero CI, Johnson MR, Comfort DA, **Shockley KR**, Chhabra SR, Kelly RM. (2005). An expression-driven approach to the prediction of carbohydrate transport and utilization regulons in the hyperthermophilic bacterium *Thermotoga maritima*. *J. Bacteriol.* 187:7267-7282. PMID: PMC1272978.
13. Johnson MR, Connors SB, Montero CI, Chou CJ, **Shockley KR**, Kelly RM. (2006). The *Thermotoga maritima* phenotype is impacted by syntrophic interaction with *Methanococcus jannaschii* in hyperthermophilic coculture. *Appl. Environ. Microb.* 72:811-818. PMID: PMC1352257.

-
14. Lee HS, **Shockley KR**, Schut GJ, Conners SB, Montero CI, Johnson MR, Chou CJ, Bridger SL, Wigner N, Brehm SD, Jenney Jr. FE, Comfort DA, Kelly RM, Adams MWW. (2006). Transcriptional and biochemical analysis of starch metabolism in the hyperthermophilic archaeon *Pyrococcus furiosus*. *J. Bacteriol.* 188:2115-2125. PMID: PMC1428126.
 15. **Shockley KR**, Churchill GA. (2006). Gene expression analysis of mouse chromosome substitution strains. *Mamm. Genome.* 17:598-614.
 16. Li R, Tsaih S-W, **Shockley K**, Stylianou IM, Wergedal J, Paigen B, Churchill GA. (2006). Structural model analysis of multiple quantitative traits. *PLoS Genet.* 2:e114. PMID: PMC1513264.
 17. Cui X, Affoutit J, **Shockley KR**, Woo Y, Churchill GA. (2006). Inheritance patterns of transcript levels in F1 hybrid mice. *Genetics.* 174:627-637. PMID: PMC1602077.
 18. Zimmerman JE, Rizzo W, **Shockley KR**, Raizen DM, Mackiewicz M, Churchill GA, Pack AI. (2006). Multiple mechanisms limit the duration of wakefulness in *Drosophila* brain. *Physiol. Genomics.* 27:337-350.
 19. Madding LS, Michel JK, **Shockley KR**, Conners SB, Epting KL, Johnson MR, Kelly RM. (2007). Role of the $\beta 1$ subunit in the function and stability of the 20S proteasome in the hyperthermophilic archaeon *Pyrococcus furiosus*. *J. Bacteriol.* 189:583-590. PMID: PMC1797377.
 20. Lecka-Czernik B, Ackert-Bicknell C, Adamo ML, Marmejelos V, Churchill GA, **Shockley KR**, Reid I, Gray A, Rosen CJ. (2007). Activation of peroxisome proliferator-activated receptor γ (PPAR γ) by rosiglitazone suppresses components of the insulin-like growth factor regulatory system *in vitro* and *in vivo*. *Endocrinology.* 148:903-911. PMID: PMC1851001.
 21. **Shockley KR**, Rosen CJ, Churchill GA, Lecka-Czernik B. (2007). PPAR $\gamma 2$ regulates a molecular signature of marrow mesenchymal stem cells. *PPAR Research.* 81219. PMID: PMC2234088.
 22. Mackiewicz M, **Shockley KR**, Romer R, Galante R, Zimmerman JE, Nadoo N, Baldwin D, Churchill GA, Pack AI. (2007). Macromolecule biosynthesis – a key function of sleep. *Physiological Genomics.* *Physiol. Genomics.* 31:441-457.
 23. Chou CJ, **Shockley KR**, Conners SB, Lewis DL, Comfort DA, Adams MWW, Kelly RM. (2007). Impact of glucan substrate linkage and elemental sulfur on bioenergetics and hydrogen production by the hyperthermophilic archaeon *Pyrococcus furiosus*. *Appl. Environ. Microb.* 73:6842-6853. PMID: PMC2074980.
 24. Stylianou IM, Affoutit JP, **Shockley KR**, Abdi FA, Sanjeev B, Rollins J, Churchill GA, Paigen BA. (2008). Applying Gene Expression, Proteomics and SNP Analysis for complex trait gene identification. *Genetics.* 178:1795-1805. PMID: PMC2278051.
 25. Ackert-Bicknell CL, **Shockley KR**, Horton LG, Lecka-Czernik B, Churchill GA, Rosen CL. (2009). Strain specific effects of Rosiglitazone on bone mass, body composition and serum IGF-1. *Endocrinology.* 150:1330-1340. PMID: PMC2654751.
 26. Mackiewicz M, Zimmerman J, **Shockley KR**, Churchill GA, Pack AI. (2009). What are microarrays teaching us about sleep? *Trends in Molecular Medicine* 15:79-87. PMID: PMC2942088.
 27. **Shockley KR**, Lazarenko OP, Czernik PJ, Rosen CJ, Churchill GA, Lecka-Czernik B. (2009). PPAR- $\gamma 2$ nuclear receptor controls multiple regulatory pathways of osteoblast

-
- differentiation from marrow mesenchymal stem cells. *J. Cell. Biochem.* 106:232-246. PMID: PMC2745312.
28. **Shockley KR***, Witmer D, Burgess-Herbert SL, Paigen B, Churchill GA. (2009). Effects of atherogenic diet on hepatic gene expression across mouse strains. *Physiol. Genomics.* 39:172-182. PMID: PMC2789673. [commentary on article appears in same issue, *Physiol. Genomics* 39:169-171]
 29. Hoenerhoff MJ, Pandiri AR, Lahousse SA, Hong HH, Ton TV, Auerbach SS, Gerrish K, Bushel PR, **Shockley KR**, Peddada SD, Sills RC. (2011). Global gene expression profiling of spontaneous hepatocellular carcinoma in B6C3F1 mice: similarities in the molecular landscape with human liver cancer. *Toxicol. Pathol.* 39:678-699. PMID: PMC4955670.
 30. Dunnick JK, Brix A, Cunny H, Vallant M, **Shockley KR**. (2012). Characterization of polybrominated diphenyl ether toxicity in Wistar Han rats and use of liver microarray data for predicting disease susceptibilities. *Toxicol. Pathol.* 40:93-106. PMID: PMC4816085.
 31. **Shockley KR***. (2012). A three-stage algorithm to make toxicologically relevant activity calls from quantitative high throughput screening data. *Environ. Health Persp.* 120:1107-1115. PMID: PMC3440085.
 32. Pandiri AR, Sills RC, Ziglioli V, Ton TV, Hong HH, Lahousse SA, Gerrish KE, Auerbach SS, **Shockley KR**, Bushel PR, Peddada SD, Hoenerhoff MJ. (2012). Differential transcriptomic analysis of spontaneous lung tumors in B6C3F1 mice: comparison to human non-small cell lung cancer. *Toxicol. Pathol.* 40:1141-1159. PMID: PMC4799722.
 33. Hoenerhoff MJ, Pandiri AR, Snyder SA, Hong HH, Ton TV, Peddada S, **Shockley K**, Chan P, Rider C, Kooistra L, Nyska A, Sills RC. (2013). Hepatocellular carcinomas in B6C3F1 mice treated with Ginkgo biloba extract for two years differ from spontaneous liver tumors in cancer gene mutations and genomic pathways. *Toxicol. Pathol.* 41:826-841. PMID: PMC4799723.
 34. Teng C, Goodwin B, **Shockley K**, Xia M, Huang R, Norris J, Merrick A, Jetten AM, Austin CP, Tice RR. (2013). Bisphenol A affects androgen receptor function via multiple mechanisms. *Chem.-Biol. Interact.* 203:556-564. PMID: PMC3722857.
 35. Anafi RC, Pellegrino R, **Shockley KR**, Romer M, Tufik S, Pack AI. (2013). Sleep is not just for the brain: transcriptional responses to sleep in peripheral tissues. *BMC Genomics.* 14:362. PMID: PMC3701596.
 36. **Shockley KR***. (2014). Using weighted entropy to rank chemicals in quantitative high throughput screening experiments. *J. Biomol. Screen.* 19:344-353. PMID: PMC4029130.
 37. Blackshear PE, Pandiri AR, Ton TV, Clayton NP, **Shockley KR**, Peddada SD, Gerrish KE, Sills RC, Hoenerhoff MJ. (2014). Spontaneous mesotheliomas in F344/N rats are characterized by dysregulation of cellular growth and immune function pathways. *Toxicol. Pathol.* 42:863-876. PMID: PMC4967937.
 38. Ray M, **Shockley K**, Kissling G. (2014). Minimizing systematic errors in quantitative high throughput screening data using standardization, background subtraction, and non-parametric regression. *J. Exp. Second Sci.* 3(2). PMID: PMC5102623.
 39. Huang R, Sakamuru S, Martin M, Reif D, Judson R, Houck K, **Shockley KR**, Fostel J, Witt K, Tong W, Zhao T, Dix D, Tice RR, Simeonov A, Austin CP, Xia M. (2014). Profiling of the Tox21 10K compound library for environmental agonists and antagonists of the estrogen receptor signaling pathway. *Sci. Rep.* 4:5664. PMID: PMC4092345.

-
40. Arnardottir ES, Nikonova EV, **Shockley KR**, Podtelezchnikov AA, Tanis KQ, Stone DJ, Gislason T, Winrow CH, Pack AI. (2014). Blood gene expression reveals reduced circadian rhythmicity in individuals resistant to sleep deprivation. *Sleep*. 37:1589-1600. PMID: PMC4173916. [editorial on article appears in same issue, *Sleep* 37:1581-1589]
 41. George-Raizen JB, **Shockley KR**, Trojanowski NF, Lamb AL, Raizen DM. (2014). Dynamically-expressed prion-like proteins form a cuticle in the pharynx of *Caenorhabditis elegans*. *Biol. Open*. 3:1139-1149. PMID: PMC4232772.
 42. Blackshear PE, Pandiri AR, Nagai H, Bhusari S, Hong L, Ton TV, Clayton NP, Wyde M, **Shockley KR**, Peddada SD, Gerrish KE, Sills RC, Hoenerhoff MJ. (2015). Gene expression of mesothelioma in vinylidene chloride-exposed F344/N rats reveal immune dysfunction, tissue damage, and inflammation pathways. *Toxicol. Pathol.* 43:171-185. PMID: PMC4275413.
 43. French JE, Morgan DL, Shepherd K, Price HC, King D, Kissling GE, Witt KL, **Shockley KR**, Pedersen LC, Gatti DM, Svenson KL, Munger SC, Churchill GA. (2015). Population based genetic determinants of individual susceptibility to benzene toxicity. *Environ. Health Perspect.* 123:237-245. PMID: PMC4348743.
 44. **Shockley KR***. (2015). Quantitative high-throughput screening data analysis: challenges and recent advances. *Drug Discov. Today* 20:296-300. PMID: PMC4375054.
 45. Chen S, Hsieh J-H, Huang R, Sakamuru S, Sin LY, Xia M, **Shockley KR**, Auerbach S, Kanaya N, Lu H, Svoboda D, Witt KL, Merrick BA, Teng CT, Tice RR. (2015). Cell-based high-throughput screening for aromatase inhibitors in the Tox21 10K library. *Toxicol. Sci.* 147:446-457. PMID: PMC4592355.
 46. Bhusari S, Pandiri A, Hiroaki N, Yu W, Foley J, T TV, DeVito M, **Shockley KR**, Peddada S, Gerrish K, Malarkey D, Hooth M, Sills R, Hoenerhoff M. (2015). Genomic profiling reveals unique molecular alterations in hepatoblastomas and adjacent hepatocellular carcinomas in B6C3F1 mice. *Toxicol. Pathol.* 43:1114-1125. PMID: PMC4670276.
 47. Hayes SA, Pandiri AR, Ton TT, Hong HH, Clayton NP, **Shockley KR**, Peddada SD, Gerrish K, Wyde M, Sills RC, Hoenerhoff MJ. (2016). Renal cell carcinomas in vinylidene chloride exposed male B6C3F1 mice are characterized by oxidative stress and TP53 pathway dysregulation. *Toxicol. Pathol.* 44:71-87. PMID: PMC4752433.
 48. Pei Y, Peng J, Behl M, Sipes NS, **Shockley KR**, Rao MS, Tice RR, Zeng X. (2016). Comparative neurotoxicity screening in human iPSC-derived neural stem cells, neurons and astrocytes. *Brain Res.* 1638:57-73. PMID: PMC5032144.
 49. Boyd WA, Smith MV, Co CA, Pirone JR, Rice JR, **Shockley KR**, Freedman JH. (2016). Developmental effects of the ToxCast™ Phase I and II chemicals in *Caenorhabditis elegans* and corresponding responses in zebrafish, rats, and rabbits. *Environ. Health Persp.* 124:586-593. PMID: PMC4858399.
 50. **Shockley KR***. (2016). Estimating potency in high-throughput screens by maximizing the rate of change in weighted Shannon entropy. *Sci. Rep.* 6:27897. PMID: PMC4908415.
 51. Dunnick JK, Merrick BA, Brix A, Morgan DL, Gerrish K, Wang Y, Flake G, Foley J, **Shockley KR**. (2016). Molecular changes in the nasal cavity after N,N-Dimethyl-p-toluidine exposure. *Toxicol. Path.* 44:835-847. PMID: PMC5804348.
 52. Dunnick JK, Morgan DL, Elmore SA, Gerrish K, Pandiri A, Ton TV, **Shockley KR**, Merrick BA. (2017). Tetrabromobisphenol A activates the hepatic interferon pathway in rats. *Toxicol. Lett.* 266:32-41. PMID: PMC5791538.

-
53. Dunnick JK, **Shockley KR**, Morgan DL, Brix A, Gerrish K, Sanders M, Ton TV, Pandiri A. (2017). Hepatic transcriptomic alterations for N,N-Dimethyl-p-toluidine (DMPT) and p-Toluidine after 5-day exposure in rats. *Arch. Toxicol.* 91:1685-1696. PMID: PMC5364093.
 54. Perron IJ, Keenan BT, Chellappa K, Lahens N, Yohn NL, **Shockley KR**, Pack AI, Veasey SC. (2018). Dietary challenges differentially affect activity and sleep/wake behavior: isolating independent associations with diet/energy balance and body weight. *PLoS One.* 13:e0196743. PMID: PMC5945034.
 55. Yamashita H, Hoenerhoff MJ, **Shockley KR**, Peddada SD, Gerrish KE, Sutton D, Cummings CA, Wang Y, Foley JF, Behl M, Waidyanatha S, Sills RC, Pandiri AR. (2018). Reduced disc shedding and phagocytosis of photoreceptor outer segment contributes to kava kava extract-induced retinal degeneration in F344/N rats. *Toxicol. Pathol.* 46: 564-573. PMID: PMC6027611.
 56. **Shockley KR*** and Kissling GE. (2018). Statistical guidance for reviewers of *Toxicologic Pathology*. *Toxicol. Pathol.* 46:647-652. PMID: PMC6063795.
 57. Dunnick JK, **Shockley KR**, Pandiri AR, Kissling GE, Gerrish KE, Ton TV, Wilson RE, Brar SS, Brix AE, Waidyanatha S, Mutlu E, Morgan DL. (2018). PBDE-47 and PBDE mixture (DE-71) toxicities and liver transcriptomic changes at PND22 after in utero/postnatal exposure in the rat. *Arch. Toxicol.* 92:3415-3433. PMID: PMC6706773.
 58. **Shockley KR**, Gupta S, Harris SF, Lahiri SN, Peddada SD. (2019). Quality control of quantitative high throughput screening data. *Front. Genet.* 10:387. PMID: PMC6520559.
 59. Hsieh J-H, Smith-Roe SL, Huang R, Sedykh A, **Shockley KR**, Auerbach SS, Merrick BA, Xia M, Tice RR, Witt KL. (2019). Identifying compounds with genotoxicity potential using Tox21 high-throughput screening assays. *Chem. Res. Toxicol.* 32:1384-1401. PMID: PMC6740247.
 60. Moore RR, Nagain H, Miller RA, Hardisty JF, Allison N, **Shockley KR**, Malarkey DE. (2019). Comparative incidences and biological outcomes for thymoma in various rat strains in National Toxicology Program studies. *Toxicol. Pathol.* 47:833-841. PMID: PMC6814546.
 61. Dunnick JK, **Shockley KR**, Morgan DL, Travlos G, Gerrish KE, Ton TV, Wilson RE, Brar SS, Brix AE, Waidyanatha S, Mutlu E, Pandiri AR. (2020). Hepatic transcriptomic patterns in the neonatal rat after pentabromodiphenyl exposure. *Toxicol. Pathol.* 48:338-349. PMID: PMC7596650.
 62. Smith-Roe S, Wyde M, Stout M, Winters JW, Hobbs CA, Shepard KG, Green AS, Kissling GE, **Shockley KR**, Tice RR, Bucher JR, Witt KL. (2020). Evaluation of the genotoxicity of cell phone radiofrequency radiation in male and female rats and mice following subchronic exposure. *Environ. Mol. Mutagen.* 61:276-290. PMID: PMC7027901.
 63. Behl M, Willson CJ, Cunny H, Foster PMD, McIntyre B, Shackelford C, **Shockley KR**, McBride S, Turner K, Waidyanatha S, Blystone CR. (2020). Multigenerational reproductive assessment of 4-methylimidazole administered in the diet to Hsd:Sprague Dawley SD rats. *Reprod. Toxicol.* 98:13-28. PMC Compliance in Process.
 64. Yamashita H, Surapureddi S, Kovi RC, Bhusari S, Ton TV, Li JL, **Shockley KR**, Peddada SD, Gerrish KE, Rider CV, Hoenerhoff MJ, Sills RC, Pandiri AR. (2020). Unique microRNA alterations in hepatocellular carcinomas arising either spontaneously or due to chronic exposure to Ginkgo biloba extract (GBE) in B6C3F1/N mice. *Arch. Toxicol.* 94:2523-2541. PMC Compliance in Process.

-
65. Frawley RP, Witt KL, Cunny H, Germolec DR, Jackson-Humbles D, Malarkey D, **Shockley KR**, Stout M, Travlos G, Buccellato M, Fallacara D, Harris S, Kissling GE, Manheng W, Surh II, White Jr K, Auerbach SS. (2020). Evaluation of 2-methoxy-4-nitroaniline (MNA) in hypersensitivity, 14-day subacute, reproductive, and genotoxicity studies. *Toxicol.* 441:152474. PMID: PMC7717523.
66. Watson ATD, Sutherland VL, Cunny H, Miller-Pinsler L, Furr J, Hebert C, Collins B, Waidyanatha S, Smith L, Vinke T, Aillon K, Xie G, **Shockley KR**, McIntyre BS. (2020). Postnatal effects of gestational and lactational gavage exposure to boric acid in the developing Sprague Dawley rat. *Toxicol. Sci.* 176:65-73. PMID: PMC7357175.
67. **Shockley KR**, Cora MC, Malarkey DE, Jackson-Humbles D, Vallant M, Collins BJ, Mutlu E, Robinson V, Waidyanatha S, Zmarowski A, Machesky N, Richey J, Harbo S, Cheng E, Patton K, Sparrow B, Dunnick JK. (2020). Comparative toxicity and liver transcriptomics of legacy and emerging brominated flame retardants following 5-day exposure in the rat. *Toxicol. Lett.* 332:222-234. PMC Compliance in Process.
68. Hubbard TD, Brix A, Blystone CR, McIntyre BS, **Shockley K**, Cunny H, Waidyanatha S, Turner KJ, McBride S, Roberts GK. (2020). Butylparaben multigenerational reproductive assessment by continuous breeding in Hsd:Sprague Dawley SD rats following dietary exposure. *Reprod. Toxicol.* 96:258-272. PMC Compliance in Process.
69. **Shockley KR***, Cora MC, Malarkey DE, Jackson-Humbles D, Vallant M, Collins BJ, Mutlu E, Robinson V, Waidyanatha S, Zmarowski A, Machesky N, Richey J, Harbo S, Cheng E, Patton K, Sparrow B, Dunnick JK. (2020). Transcriptomic data from the rat liver after five days of exposure to legacy or emerging brominated flame retardants. *Data Brief.* 32: 106136. PMID: PMC7452714.
70. Sills R, Johnson G, Anderson R, Johnson C, Staup M, Brown D, Churchill S, Kurtz D, Cushman J, Waidyanatha S, Robinson V, Cesta M, Behl M, **Shockley KR**, Little P. (2020). Qualitative and quantitative neuropathology approaches using magnetic resonance microscopy (diffusion tensor imaging) and stereology in a hexachlorophene model of myelinopathy in Sprague-Dawley rats. *Toxicol. Pathol.* 48:965-980. PMID: PMC7755100.
71. Tokarz DA, Steinbach TJ, Lokhande A, Srivastava G, Ugalmugle R, Co C, **Shockley KR**, Singletary E, Cesta M, Thomas H, Chen V, Hobbie K, Crabbs TA. Using artificial intelligence to detect, classify, and objectively score severity of rodent cardiomyopathy. *Toxicol. Pathol.* (in press).
72. Watson ATD, Johnson VJ, Burlison G, Luster MI, Fallacara D, Sparrow B, Cesta M, Cora M, Shockley KR, Stout M, Blystone C, Germolec D. (2021). Immunotoxicity of sulfolane following developmental exposure in Hsd:Sprague Dawley SD rats and adult exposure in B6C3F1/N mice. *J Immunotoxicol.* (in press).
73. Huang MC, Furr JR, Robinson VG, Betz L, Shockley K, Cunny H, Witt K, Waidyanatha S, Germolec D. (2020). Oral deoxynivalenol toxicity in Harlan Sprague Dawley (Hsd:Sprague Dawley ® SD ®) rat dams and their offspring. *Food Chem Toxicol.* (in press).

Book Chapters –

- B1) Pysz MA, Rinker KD, **Shockley KR**, Kelly RM. (2001). Continuous cultivation methods for hyperthermophilic biomass and enzyme production. *Methods in Enzymology.* 330:31-40.
- B2) Kelly RM, **Shockley KR**. (2004). Applications of genomic Data – Enzyme discovery and microbial genomics. *In* C. Fraser, K. Nelson, and T. Read (eds.), *Microbial Genomes*. Humana Press, Totowa, New Jersey, pp. 461-484.

-
- B3) Adams MWW, Jenney FE, Chou CJ, Hamilton-Brehm S, Poole FL, **Shockley KR**, Tachdjian S, Kelly RM. (2006). Transcriptomics, proteomics and structural genomics of *Pyrococcus furiosus*. Archaea – physiology, molecular biology and evolution. In Garrett, R. and Klenk, R.- P. (eds.), Archaea. Blackwell Publishing Inc., Malden, Massachusetts.
- B4) Tachdjian S, **Shockley KR**, Connors SB, Kelly RM. (2008). Functional genomics of stress response in extremophilic archaea. *In* P. Blum (ed.), Archaea: new models for prokaryotic biology. Caister Academic Press, Wymondham, UK.

Corrections –

- C1) French JE, Gatti DM, Morgan DL, Kissling GE, **Shockley KR**, Knudsen GA, Shepard KG, Price HC, King D, Witt KL, Pedersen LC, Munger SC, Svenson KL, Churchill GA. (2018). Erratum: “Diversity outbred mice identify population-based exposure thresholds and genetic factors that influence benzene-induced genotoxicity”. Environ. Health Perspect. 126:069003. PMID: PMC6084855.

Letters to the Editor –

- L1) Smith-Roe SL, **Shockley KR**, Bucher JR, Witt KL. (2020). Response to Letter to the Editor. Environ. Mol. Mutagen. 61: 294-295.

Peer-Reviewed National Toxicology Program Reports –

Developmental and Reproductive Toxicity Reports

- NTP1) National Toxicology Program. (2020). Prenatal developmental toxicity studies of Tris(chloropropyl) phosphate (CAS No. 13674-84-5) in Sprague-Dawley (Hsd:Sprague Dawley SD) rats (gavage studies). Developmental and Reproductive Toxicity Report No. 1. [collaborator]
- NTP2) National Toxicology Program. (2020). Prenatal developmental toxicity studies of 4-Methylcyclohexanemethanol (CAS No. 34885-03-5) in Sprague-Dawley (Hsd:Sprague Dawley SD) rats (gavage studies). Developmental and Reproductive Toxicity Report No. 2. [collaborator]
- NTP3) National Toxicology Program. (2020). Prenatal developmental toxicity studies of Vinpocetine (CAS No. 42971-09-5) in Sprague-Dawley (Hsd:Sprague Dawley SD) rats (gavage studies). Developmental and Reproductive Toxicity Report No. 3. [collaborator]
- NTP4) National Toxicology Program. (2020). Prenatal developmental toxicity studies of Dimethylaminoethanol bitartrate (CAS No. 5988-51-2) in Sprague-Dawley (Hsd:Sprague Dawley SD) rats (gavage studies). Developmental and Reproductive Toxicity Report No. 4. [collaborator]

Immunotoxicity Reports

- NTP5) National Toxicology Program. (2020). Dermal hypersensitivity and irritancy studies of 4-methylcyclohexanemethanol (CASRN 34885-03-5) and crude 4-methylcyclohexanemethanol administered topically to female BALB/c. Immunotoxicity Report No. 1. [collaborator]

Research Reports

- NTP6) National Toxicology Program. (2018). National Toxicology Program approach to genomic dose-response modeling. Research Report No. 5. [contributor]

NTP7) Harrill AH, Borghoff S, Zorrilla L, Blystone C, Kissling GE, Malarkey D, **Shockley K**, Travlos G, DeVito MJ. (2018). NTP Research Report on performance characteristics of Diversity Outbred (J:DO) mice for toxicology studies. NTP Research Report No. 6. [author]

Technical Reports

NTP8) National Toxicology Program. (2018). Toxicology and carcinogenesis studies in Hsd:Sprague Dawley SD rats exposed to whole-body radio frequency radiation at a frequency (900MHz) and modulations (GSM and CDMA) used by cell phones. Technical Report Series No. 595. [contributor]

NTP9) National Toxicology Program. (2018). Toxicology and carcinogenesis studies in B6C3F1/N mice exposed to whole-body radio frequency radiation at a frequency (1,900 MHz) and modulations (GSM and CDMA) used by cell phones. Technical Report Series No. 596. [contributor]

NTP10) National Toxicology Program. (2020). Toxicology and carcinogenesis studies of 2-Hydroxy-4-methoxybenzophenone (CASRN 131-57-7) administered in feed to Sprague Dawley (Hsd:Sprague Dawley SD) rats and B6C3F1/N mice. Technical Report Series No. 597. [collaborator]

NTP11) National Toxicology Program. (2020). Toxicology and Carcinogenesis studies of Perfluorooctanoic Acid (CASRN 335-67-1) administered in feed to Sprague Dawley (Hsd:Sprague Dawley SD) rats. Technical Report Series No. 598. [collaborator]

Toxicity Reports

NTP12) National Toxicology Program. (2020). Toxicity studies of Fullerene C60 (1 µm and 50 nm) (CASRN 99685-96-8) administered by nose-only inhalation to Wistar Han [CrI:WI (Han)] rats and B6C3F1/N mice. Toxicity Report Series No. 87. [collaborator]

NTP13) National Toxicology Program. (2020). Toxicity studies of abrasive blasting agents administered by inhalation to F344/NTac rats and Sprague Dawley (Hsd:Sprague Dawley SD) rats. Toxicity Report Series No. 91. [collaborator]

NTP14) National Toxicology Program. (2019). Toxicity studies of 1020 long multiwalled carbon nanotubes administered by inhalation to Sprague Dawley (HSD:Sprague Dawley SD) rats and B6C3F1/N mice. Toxicity Report Series No. 94. [collaborator]

NTP15) National Toxicology Program. (2019). Toxicity studies of myristicin administered by gavage to F344/NTac rats and B6C3F1/N mice. Toxicity Report Series No. 95. [collaborator]

NTP16) National Toxicology Program. (2019). Toxicity studies of perfluoroalkyl sulfonates (perfluorobutane sulfonic acid, perfluorohexane sulfonate potassium salt, and perfluorooctane sulfonic acid) administered by gavage to Sprague Dawley (HSD:Sprague Dawley SD) rats. Toxicity Report Series No. 96. [collaborator]

NTP17) National Toxicology Program. (2019). Toxicity studies of perfluoroalkyl carboxylates (perfluorohexanoic acid, perfluorooctanoic acid, perfluorononanoic acid, and perfluorodecanoic acid) administered by gavage to Sprague Dawley (HSD:Sprague Dawley SD) rats. Toxicity Report Series No. 97. [collaborator]

Published Abstracts –

- A1) **Shockley KR**, Ward DE, Pysz MA, Chhabra SR, Conners SB, Kelly RM. (2002). Regulation of proteolysis in hyperthermophilic microorganisms. *Abstr. Pap. Am. Chem. S.* 224:U203-U204.
- A2) Chhabra SR, **Shockley KR**, Conners SB, Scott K, Wolfinger RD, Kelly RM. (2003). Glycoside hydrolases from *Thermotoga maritima*: physiological and biotechnological aspects. *Abstr. Pap. Am. Chem. S.* 225:U200.
- A3) Kelly RM, Conners SB, **Shockley KR**, Johnson MR, Montero CI. (2005). Comparative functional genomics of the hyperthermophilic bacterium *Thermotoga maritima* and the archaeon *Pyrococcus furiosus*. *Abstr. Pap. Am. Chem. S.* 229:U1174.
- A4) Johnson MR, Conners SB, Montero CI, **Shockley KR**, Kelly RM. (2005). Growth phase dependent cell aggregation, maturation and detachment in the hyperthermophilic bacterium *Thermotoga maritima*. *Abstr. Pap. Am. Chem. S.* 229:U236.
- A5) Conners SB, Montero CI, Comfort DA, **Shockley KR**, Johnson MR, Chhabra SR, Kelly RM. (2005). Prediction of carbohydrate transport and utilization regulons in the hyperthermophilic bacterium *Thermotoga maritima* through the use of carbohydrate-specific transcriptional response. *Abstr. Pap. Am. Chem. S.* 229:U240.
- A6) Zimmerman JE, Mackiewicz M, Rizzo W, **Shockley K**, Churchill GA, Pack AI. Change in gene expression with sleep and wakefulness in Drosophila brain. (2005). *Sleep* 28:A341.
- A7) **Shockley K**, Lazarenko O, Churchill G, Ackert-Bicknell C, Rosen C, Lecka-Czernik B. (2005). PPAR-gamma 2 nuclear receptor controls multiple regulatory pathways of osteoblast and adipocyte differentiation including IGF-1 and TGF-beta/BMP signaling. *J. Bone Miner. Res.* 20:S245.
- A8) Pack A, Zimmerman J, **Shockley K**, Mackiewicz M. Elucidating mechanisms regulating sleep and wake by expression profiling studies. (2006). *J. Sleep Res.* 15:28.
- A9) Lecka-Czernik B, Lazarenko O, Czernik P, Rosen C, **Shockley K**, Churchill G. (2006). Osteoblastic activity of Wnt signaling pathway is controlled by PPAR-gamma 2 nuclear receptor. *J. Bone Min. Res.* 21:S382.
- A10) Michel JK, Madding LS, **Shockley KR**, Conners SB, Epting KL, Johnson MR, Tachdjian S, Kelly RM. (2006). Functional role of beta proteins in the eomophilic archaeal 20S proteasomes using functional genomic and proteomic approaches. (2006). *Abstr. Pap. Am. Chem. S.* 232:147-BIOT.
- A11) Mackiewicz M, **Shockley K**, Romer M, Galante R, Zimmerman J, Naidoo N, Churchill G, Pack A. (2007). Macromolecule biosynthesis – A key function of sleep. *Sleep* 30:A365-A366.
- A12) Su ZG, **Shockley KR**, Stylianou I, Paigen B. (2008). QTL genes that regulate HDL on distal mouse chromosome 5 are *Srb1* and *Acads*. *Arterioscl. Throm. Vas.* 28:E36.
- A13) Ackert-Bicknell C, Churchill GA, **Shockley KR**, Horowitz M, Canalis E, Rosen CJ. (2008). A recombinant congenic strain (B.H-6) establishes that trabecular bone mass and bone marrow adiposity are distinct and heritable phenotypes. *J. Bone Min. Res.* 23:S107.
- A14) Tice RR, Witt KL, **Shockley KR**, Caspary WJ, Xia M, Huang R, Austin CP. (2009). The use of quantitative high throughput screens (qHTS) in genetic toxicology. *Environ. Mol. Mutagen.* 50:542.

-
- A15) Witt K, Huang R, **Shockley K**, Austin CP, Zheng M, Sun Y, Tice RR, Xia M. (2010). Assessing the DNA damaging potential of chemicals via activation of the p53 pathway using quantitative high-throughput screening (qHTS). *The Toxicologist Supplement to Toxicol. Sci.* 114:152.
- A16) **Shockley K**, Kissling G, Huang R, Xia M, Austin C, Tice R. (2010). A statistical framework for analyzing quantitative high-throughput screening data (qHTS). *The Toxicologist Supplement to Toxicol. Sci.* 114:42.
- A17) Lamb A, **Shockley KR**, Raizen DM. (2010). Homeostasis of a *C. elegans* sleep-like state. *Sleep* 33:A59.
- A18) Auerbach SS, **Shockley KR**, Vallant M, Cunny H, Dunnick J. (2011). Characterization of the hepatic response to a mixture of low molecular weight polybrominated diphenyl ethers: disease, signature, network, and pathway analysis. *The Toxicologist Supplement to Toxicol. Sci.* 120:342.
- A19) **Shockley KR**, Kissling GE, Huang R, Xia M, Austin CP, Tice RR. (2011). Using a multiple stage decision tree to make activity calls in quantitative high throughput screening (qHTS) data. *The Toxicologist Supplement to Toxicol. Sci.* 120:103.
- A20) Hoenerhoff MJ, Pandiri A, Lahousse S, Hong HH, Ton TV, Masinde T, Auerbach S, Bushel P, Shockley K, Peddada S, Sills R. (2011). Global gene expression profiling of spontaneous HCC in the B6C3F1 mouse identifies similarly dysregulated gene networks in mouse and humans. *FASEB J. Meeting Abstract Supplement* 25:442.1.
- A21) Arnardottir ES, Nikonova EV, Shockley KR, Podtelezchnikov AA, Tanis KQ, Stone DJ, Maislin G, Gislason T, Renger J, Winrow CJ, Pack AI. (2011). Using microarrays to identify novel biomarkers: es-2-4. *Sleep Biol. Rhythms* 9:220-221.
- A22) Pellegrino R, Anafi R, **Shockley KR**, Romer M, Hakonarson HH, Pack A. (2012). Transcriptional effects of sleep and sleep deprivation on peripheral tissues. *Sleep* 35:A13-A14.
- A23) Anafi R, Nikonova EV, Arnardottir ES, **Shockley KR**, McDonald TP, Podtelezchnikov AA, Winrow CJ, Hogenesch JB, Renger JJ, Pack A. (2012). Assessing circadian phase in human subjects using limited peripheral blood measurements. *Sleep* 35:A133-A134.
- A24) Hobbs CA, Morgan DL, Shepard K, Price HC, Kissling GE, **Shockley KR**, Recio L, Witt KL, French JE. (2012). Population variation in micronucleus response to inhaled benzene in diversity outbred (J:DO) mice. *Environ. Mol. Mutagen.* 53:S26.
- A25) **Shockley KR**, Brix AE, Vallant MK, Cunny HC, Dunnick JK. (2012). Characterization of polybrominated diphenyl ether toxicity in Wistar Hans rats and use of liver microarray data for predicting disease susceptibilities. *The Toxicologist Supplement to Toxicol. Sci.* 126:266.
- A26) Arnardottir ES, Nikonova EV, **Shockley KR**, Anafi RC, Podtelezchnikov AA, Tanis K, Stone DJ, Maislin G, Gislason T, Renger J, Winrow C, Pack AI. (2012). Response to sleep deprivation and recovery sleep: human blood biomarkers. *J. Sleep Res.* 21:38.
- A27) Bhusari S, Pandiri A, Wang Y, Foley J, Hong H, Ton T, **Shockley KR**, Peddada S, Gerrish K, Malarkey D, Sills R, Hoenerhoff M. (2013). Transcriptomic profiling of hepatoblastomas and associated hepatocellular carcinomas in B6C3F1 mice. *The Toxicologist Supplement to Toxicol. Sci.* 132:234.

-
- A28) Witt KL, Kissling GE, Morgan DL, **Shockley KR**, Gatti DM, Churchill GA, French JE. (2013). Benchmark dose models for benzene genotoxicity using the diversity outbred mouse. *The Toxicologist Supplement to Toxicol. Sci.* 132:414.
- A29) Huang R, Sakamura, S, Martin MT, Reif D, Judson R, Houck K, Casey W, Hsieh J, **Shockley K**, Ceger P, Fostel J, Witt KL, Tong W, Rotroff D, Simeonov A, Dix DJ, Austin CP, Kavlock R, Tice RR, Xia M. (2014). Profiling of the Tox21 10K compound library for agonists and antagonists of the estrogen receptor alpha signaling pathway. *The Toxicologist Supplement to Toxicol. Sci.* 138:41.
- A30) Rinckel I, Casey W, Huang R, Hsieh J, **Shockley K**, Xia M, Tice RR, Ceger P. (2014). Performance of the BG1 Luc and ER β -lactamase estrogen receptor transactivation assays in Tox21. *The Toxicologist Supplement to Toxicol. Sci.* 138:43.
- A31) **Shockley K**. (2014). Using weighted entropy to rank chemicals in Tox21 Phase II BG1 ER-Luc estrogen receptor assays. *The Toxicologist Supplement to Toxicol. Sci.* 138:609.
- A32) Merrick B, **Shockley KR**, Morgan DL, Gerrish K, Elmore S, Stanko JP, Pandiri AR, Ton T, Dunnick JK. (2015). Liver microarray analysis by estrous cycle staging after 90-day Tetrabromobisphenol A (TBBPA) exposure. *The Toxicologist Supplement to Toxicol. Sci.* 144:20.
- A33) **Shockley KR**, Morgan DL, Brix A, Flake G, Foley J, Wang Y, Pandiri AR, Mahler B, Lyght O, Gerrish K, Dunnick JK. (2015). NTP studies of N,N-dimethyl-p-toluidine (DMPT), a component in medical devices and dental material. *The Toxicologist Supplement to Toxicol. Sci.* 144:434.
- A34) Yamashita H, Pandiri A, **Shockley K**, Peddada S, Gerrish K, Rider C, Hoenerhoff M, Sills R. (2015). MicroRNA profiling of hepatocellular carcinomas in B6C3F1 mice treated with ginkgo biloba extract gavage for 2 years. *Int. J. Toxicol.* 34:88.
- A35) Rider CV, Auerbach SS, Ferguson SS, Tokar EJ, Hsieh J-H, **Shockley KR**, Germolec DR, Jutlu E, Masten SA, Waidyanatha S. (2015). From Deepwater horizon to high-throughput screening: polycyclic aromatic compound testing at the National Toxicology Program. *Environ. Mol. Mutagen.* 56:S37.
- A36) Witt KL, Hsieh J-H, Xia M, Huang R, Auerbach SS, Paules RS, **Shockley KR**, Merrick BA, Sedykh A, Tice RR, Smith-Roe SL. (2015). High-throughput screening for rapid identification of potential genotoxicants in large compound libraries: comparison of the Tox21 approach to classic genotoxicity assays. *Environ. Mol. Mutagen.* 56:S53.
- A37) Rider C, Auerbach S, Ferguson SS, Tokar E, Hsieh J-H, **Shockley K**, Germolec D, Mutlu E, Masten S, Waidyantha S. (2016). *In vitro* screening to *in vivo* testing of polycyclic aromatic compounds at the National Toxicology Program. *The Toxicologist Supplement to Toxicol. Sci.* 150:106.
- A38) Yamashita H, Hoenerhoff MJ, **Shockley KR**, Peddada SD, Gerrish KE, Sutton D, Cummings CA, Wang Y, Foley JF, Behl M, Sills RC, Pandiri AR. (2016). Reduced disc shedding contribute to Kava Kava extract-induced retinal degeneration in F344/N rats. *The Toxicologist Supplement to Toxicol. Sci.* 150:143.
- A39) **Shockley KR**. (2016). Estimating compound potency in Tox21 phase II estrogen receptor agonist assays using weighted information gain. *The Toxicologist Supplement to Toxicol. Sci.* 150:387.

-
- A40) DeVito M, Borghoff S, Zorilla L, **Shockley KR**, Kissling G, Travlos G. (2016). The effects of a high fat (HF) diet on male diversity outbred (DO) mice. *The Toxicologist Supplement to Toxicol. Sci.* 150:490.
- A41) Yamashita H, Surapureddi S, Bhusari S, **Shockley KR**, Peddada SD, Gerrish KE, Rider CV, Hoenerhoff MJ, Sills RC, Pandiri AR. (2017). MiR-31-mediated upregulation of CDK1 in Ginkgo biloba extract-induced hepatocellular carcinomas in B6C3F1/N mice. *The Toxicologist Supplement to Toxicol. Sci.* 156:18-19.
- A42) **Shockley KR**. (2018). Toxicogenomics study of pentabrominated diphenyl ether in rat liver during early life exposure. *The Toxicologist Supplement to Toxicol. Sci.* 162: 249-250.
- A43) Sipes NS, Huang R, **Shockley K**, Martin MT, Shapiro AJ, Addington J, Auerbach S, Paules R, Judson R, Houck K, Hong H, Hsieh J. (2018). Confidence in fitting and hitting concentration-response data: Tox21 10k library pipeline comparison. *The Toxicologist Supplement to Toxicol. Sci.* 162:367.
- A44) Gillera SA, Filgo A, Kissling G, **Shockley K**, Birnbaum L, Fenton S. (2018). Sex-specific metabolic and liver gene expression changes in Wistar rats following TBBPA exposure. *The Toxicologist Supplement to Toxicol. Sci.* 162:427.
- A45) Bollman F, Qiu LQ, Snyder BL, **Shockley KR**, Inglese J, Blackshear PJ. (2018). A quantitative high-throughput screen to identify small molecules for the induction of Tristetraprolin expression. *FASEB J. Meeting Abstract Supplement* 32:826.9.
- A46) Huang MC, Brix A, Turner K, Cunny H, McIntyre B, Cora M, **Shockley K**, Waidyanatha S, Blystone C. (2019). Effects of Black Cohosh Root extract on reproduction and development of male and female HSD Sprague-Dawley SD Rats. *The Toxicologist Supplement to Toxicol. Sci.* 168:128.
- A47) Krause JD, McBride SJ, Smith M, **Shockley KR**, Cunny HC. (2019). Strength of litter effect and litter size effect in body weight data across multiple toxicity studies in Harlan Sprague-Dawley rats. *The Toxicologist Supplement to Toxicol. Sci.* 168:141.
- A48) **Shockley KR**, Herbert RA, Janardhan KS, Pandiri AR, Vallant MK, Merrick BA, Dunnick JK. (2019). Disease sensitive and resistant mouse strains identified in a mouse aging study. *The Toxicologist Supplement to Toxicol. Sci.* 168:141.
- A49) Dzierlenga A, Janardhan K, Herbert R, Cora M, Vallant M, Gerken D, Hejtmancik M, Waidyanatha S, **Shockley K**, Blystone C. (2019). Class comparison study of perfluorinated substances in Sprague-Dawley rats: liver toxicity and thyroid hormone dysregulation. *The Toxicologist Supplement to Toxicol. Sci.* 168:168.
- A50) Frawley R, Rider C, Johnson V, Burlison G, **Shockley K**, Willson C, Steinbach T, Germolec D. (2019). Immunomodulatory activity of N-Butylbenzenesulfonamide in female B6C3F1/N mice. *The Toxicologist Supplement to Toxicol. Sci.* 168:303.
- A51) Hubbard TD, Elmore S, Stout MD, **Shockley KR**, Crabbs T, Cunny H, McBride S, Sparrow B, Toy H, Blystone C. (2020). Comparative toxicity and carcinogenicity of Di(2-ethylhexyl) Phthalate (DEHP) in perinatal versus adult exposed HSD: Sprague-Dawley SD rats. *The Toxicologist, Supplement to Toxicol. Sci.* 174:77.
- A52) Frawley R, Ryan K, Johnson V, Gullede T, Manheng W, **Shockley K**, Harris S, and Germolec D. (2020). Evaluation of contact sensitization induced by four ionic liquids. *The Toxicologist, Supplement to Toxicol. Sci.* 174:209.

-
- A53) **Shockley KR**, and Peddada SD. (2020). Using ANOVA-based clustering to evaluate chemical response patterns in quantitative high-throughput screening data. *The Toxicologist, Supplement to Toxicol. Sci.* 174:242-243.
- A54) Easterling M, Devito M, and **Shockley K**. (2020). In vitro and PBPK models for a mixture of dioxin like compounds. *The Toxicologist, Supplement to Toxicol. Sci.* 174:431.
- A55) Huang M, **Shockley K**, Parham F, Sipes N, Auerbach S, and Blystone C. (2020). Elucidating Relationships between Internal Dose, Thyroid Hormones, and Hepatic Gene Expression Altered by Perfluoroalkyl Substances in Rats following 28-Day Oral Exposure. *The Toxicologist, Supplement to Toxicol. Sci.* 174:510.

Other Selected Presentations and Posters –

Shockley, KR. (1997). Mechanism of ethylene stimulation of Taxol production in plant cell cultures. Second Annual Symposium of the NSF REU Program in Bioprocessing, Department of Chemical and Biological Engineering, Colorado State University, Fort Collins, CO (presentation)

Shockley KR, Kelly RM. (2000). Targeted microarray analysis of proteolysis in hyperthermophilic microorganisms. Seventh Annual NSF Hyperthermophiles Symposium, Raleigh, NC (presentation)

Shockley KR, Kelly RM. (2000). Targeted microarray analysis of proteolysis in hyperthermophilic microorganisms. NSF Hyperthermophiles Conference, North Carolina State University, Raleigh, NC (poster)

Shockley KR, Kelly RM. (2000). Targeted microarray analysis of proteolysis in hyperthermophilic microorganisms. Schoenborn Graduate Research Symposium Poster Session, North Carolina State University, Raleigh, NC (poster)

Shockley KR, Kelly RM. (2001). Targeted microarray analysis of proteolysis in hyperthermophilic microorganisms. Schoenborn Graduate Research Symposium Poster Session, North Carolina State University, Raleigh, NC (poster)

Shockley KR, Kelly RM. (2002). Targeted microarray analysis of proteolysis in hyperthermophilic microorganisms. Mid-Atlantic Biochemical Engineering Consortium (MABEC), Philadelphia, PA (presentation)

Shockley KR, Ward DE, Chhabra SR, Conners SB, Montero CI, Kelly RM. (2002). Heat shock by the hyperthermophilic archaeon *Pyrococcus furiosus*. Schoenborn Graduate Research Symposium Poster Session, North Carolina State University, Raleigh, NC (poster)

Shockley KR, Kelly RM. (2002). Regulation of proteolysis in hyperthermophilic microorganisms. Graduate Seminar Series, Graduate Seminar Series, Department of Chemical Engineering, North Carolina State University, Raleigh, NC (presentation)

Shockley KR, Conners SB, Johnson MR, Pysz MA, Montero CI, Scott K, Chhabra SR, Kelly RM. (2003). cDNA microarray-based transcriptional analysis of the model hyperthermophiles *Thermotoga maritima* and *Pyrococcus furiosus* during transient and steady growth conditions. Engineering Conferences International Biochemical Engineering XIII: Biochemical Engineering in the Era of Genomics, Systems Biology, Genetic Medicine & Nanotechnologies, Boulder, CO (poster)

Shockley KR, Conners SB, Montero CI, Johnson MR, Chhabra SR, Pysz MA, Kelly RM. (2003). Microarray-based transcriptional analysis of thermal stress response and sugar utilization in the hyperthermophiles *Pyrococcus furiosus* and *Thermotoga maritima*. Life in the Extreme: Opportunities in Idaho, Idaho State University, Pocatello, ID (presentation)

-
- Shockley KR.** (2003). From extreme environments to hot spots: functional genomics of hyperthermophiles. Schoenborn Graduate Research Symposium, North Carolina State University, Raleigh, NC (presentation)
- Shockley KR.** (2003). Transcriptional analysis of the heterotrophic hyperthermophilic microorganisms *Thermotoga maritima* and *Pyrococcus furiosus*. The Jackson Laboratory, Bar Harbor, ME (presentation)
- Shockley KR,** Zimmerman JE, Mackiewicz M, Pack AI, Churchill GA. (2005). Analysis of variance-based assessments of time series microarray data applied to flies and mice. Systems Biology: Global Regulation of Gene Expression, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY (poster)
- Shockley KR.** (2005). Statistical assessments of time series GeneChip® data using multi-factorial ANOVA provide novel insights into sleep deprivation and the function of PPAR- γ 2 in mice. Discovery Strategies 2005: Improving the predictive value of mouse models in drug discovery and development, The Jackson Laboratory, Bar Harbor, ME (presentation)
- Shockley KR.** (2006). Candidate genes from gene expression data. Novartis Institute for Biomedical Research, Inc., Boston, MA (presentation)
- Shockley KR,** Churchill GA. (2006). 5th Annual Meeting of the Complex Trait Consortium. University of North Carolina, Chapel Hill, NC. (poster and short presentation)
- Shockley KR,** Lecka-Czernik B, Rosen CJ, Churchill GA. (2007). PPAR-g2 regulates adipocyte differentiation of bone marrow mesenchymal stem cells. Meeting of the National Centers of Integrative and Systems Biology, Boston, MA (poster)
- Shockley KR.** (2007). Using the gene expression response to rosiglitazone to study osteoporosis and obesity. Department of Chemical and Biological Engineering, The University of Alabama, Tuscaloosa, AL (presentation)
- Shockley KR.** (2008). Using the gene expression response to rosiglitazone to study osteoporosis and obesity. Department of Chemical Engineering, Texas Tech University, Lubbock, TX (presentation)
- Shockley KR.** (2008). Using the gene expression response to rosiglitazone to study osteoporosis and obesity. Department of Chemical Engineering, University of Tulsa, Tulsa, OK (presentation)
- Shockley KR.** (2008). AIChE Meeting: The University of Tulsa. Department of Chemical Engineering, University of Tulsa, Tulsa, OK (presentation)
- Shockley KR.** (2008). Using gene expression microarrays to study gene response in mouse stem cells. Department of Biological Systems Engineering, Virginia Tech, Blacksburg, VA (presentation)
- Shockley KR.** (2008). Using gene expression microarrays to study gene response in mouse stem cells. The National Institute of Environmental Health Sciences, Research Triangle Park, NC (presentation)
- Shockley KR.** (2008). PPAR γ 2 controls osteoblast differentiation in marrow mesenchymal stem cells. National Institute of Environmental Health Sciences, Research Triangle Park, NC (presentation)
- Shockley KR.** (2008). Mice respond to atherogenic high-fat diet with strain-specific differences in gene expression. 7th Annual Meeting of the Complex Trait Consortium, Montreal, Canada (presentation)

Shockley KR, Lecka-Czernik B, Rosen CJ, Churchill GA. (2008). Using gene expression microarrays to study drug response in mouse stem cells. The Division of Internal Research Board of Scientific Counselors review of the Biostatistics Branch, NIEHS, Research Triangle Park, NC (poster)

Shockley KR. (2009). Using mouse gene expression and phenotypes to explore the effects of atherogenic diet. Biostatistics Branch Seminar Series, NIEHS, Research Triangle Park, NC (presentation)

Shockley KR, Kissling GE, Xia M, Huang R, Austin CP, Tice RR. (2009). Analysis of quantitative high throughput screening data for applications in toxicology. The First ToxCast Data Analysis Summit, Environmental Protection Agency, Research Triangle Park, NC (poster)

Shockley KR. (2009). qHTS: description of a p53 assay data set. Biostatistics Branch/Genetics interest group, NIEHS, Research Triangle Park, NC (presentation)

Shockley KR. (2009). qHTS analysis update. Tox21 General Meeting, US Environmental Protection Agency, Research Triangle Park, NC (presentation)

Shockley KR. (2010). Tox21 Informatics Working Group. The NTP Board of Scientific Counselors Meeting, National Institute of Environmental Health Sciences, Research Triangle Park, NC (presentation)

Shockley KR, Kissling GE, Huang R, Xia M, Austin CP, Tice RR. (2010). A decision tree algorithm for analyzing quantitative high-throughput screening data (qHTS). Review of the Biomolecular Screening Branch by the NTP Board of Scientific Counselors, NIEHS, Research Triangle Park, NC (poster)

Shockley KR. (2011). Preliminary comparison of different activity calls approaches. Tox21 General Meeting, NIH Chemical Genomics Center, Bethesda, MD (presentation)

Shockley KR, Brix AE, Vallant MK, Cuny HC, Dunnick JK. (2011). Characterization of polybrominated diphenyl ether toxicity in Wistar Han rats and use of liver microarray data for predicting disease susceptibilities. NIEHS Genomics Day, NIEHS, Research Triangle Park, NC (poster)

Shockley KR. (2012). A three-stage algorithm to make toxicologically relevant activity calls in quantitative high-throughput screening (qHTS) data. The Division of Internal Research Board of Scientific Counselors Review of the Biostatistics Branch, NIEHS, Research Triangle Park, NC (poster)

Shockley KR. (2014). Using weighted entropy to rank chemicals in Tox21 Phase II BG1 ER-Luc estrogen receptor assays. Interagency Coordinating Committee on the Validation of Alternative Methods, NIEHS, Research Triangle Park, NC (poster)

Shockley KR. (2014). Reflections on communicating science and social media. Biostatistics Branch/Genetics interest group, NIEHS, Research Triangle Park, NC (presentation)

Shockley KR, Gupta S, Kaul A, Harris SF, Lahiri SN, Peddada SD. (2016). ANOVA-based clustering to improve potency estimation in quantitative high throughput screening data. NIEHS Science Days, NIEHS, Research Triangle Park, NC (poster)

Shockley KR, Gupta S, Kaul A, Harris SF, Lahiri SN, Peddada SD. (2017). ANOVA-based clustering to improve quality control in quantitative high throughput screening data. NIEHS Genomics Day, NIEHS, Research Triangle Park, NC (poster)

Shockley KR. (2017). ANOVA-based clustering for quality assessment of *in vitro* toxicity data. Biostatistics and Computational Biology Branch/Genetics interest group, NIEHS, Research Triangle Park, NC (presentations, three-part series)

Shockley KR, Kaul A, Gupta S, Harris S, Lahiri SN, Peddada S. (2017). ANOVA-based clustering to improve potency estimation in quantitative high-throughput screening data. Joint Statistical Meetings, Baltimore, MD (presentation)

Shockley KR. (2017). Fitting curves using non-parametric approaches. Peer Review of Draft NTP Approach to Genomic Dose-Response Modeling Expert Panel Meeting, NIEHS, Research Triangle Park, NC (presentation)

Shockley KR. (2018). Cluster analysis by subgroups using ANOVA: Applications for quantitative high-throughput screening data. Biostatistics and Computational Biology Branch Seminar Series, NIEHS, Research Triangle Park, NC (presentation)

Shockley KR, Morgan DL, Pandiri AR, Kissling GE, Ton TT, Wilson RE, Frar SS, Brix AE, Dunnick JK. (2018). Toxicogenomics study of pentabrominated diphenyl ether in rat liver during early life exposure. NIEHS Genomics Day, NIEHS, Research Triangle Park, NC (poster)

Curated Data Sets –

GEO Data Set GSE10493. Novartis 12 Strain Diet Sex Survey. Public on December 10, 2008.

Mouse Phenome Database. Diet effects on blood chemistry and lipids in 10 inbred strains of mice. MPD:Shockley1. Public on August 11, 2009.

GEO Data Set GSE10192. PPAR Controls Gene Expression in MSC Cells. Public on January 15, 2009.

GEO Data Set GSE32156. Expression data from PBDE treated rats at PND22 and Week 13. Public on October 5, 2011.

GEO Data Set GSE46288. Expression data from *C. elegans* during L3 and L3-lethargus. Public on April 18, 2014.

GEO Data Set GSE46289. Expression data from *C. elegans* during L4, L4-lethargus, and Adult. Public on April 18, 2014.

GEO Data Set GSE46291. *C. elegans* during lethargus. Public on April 18, 2014.

GEO Data Set GSE56931. Blood gene expression reveals reduced circadian rhythmicity in individuals resistant to sleep deprivation. Public on October 2, 2014.

GEO Data Set GSE85454. Molecular Changes in the Nasal Cavity after 5 days of N, N-dimethyl-p-toluidine Exposure. Public on August 11, 2016.

GEO Data Set GSE100502. Hepatic transcriptomic alterations for N,N-dimethyl-p-toluidine (DMPT) and p-toluidine after 5-day exposure in rats. Public on June 27, 2017.

GEO Data Set GSE153366. Brominated flame retardants effects on the liver transcriptome. Public on July 15, 2020.

GEO Data Set GSE154914. Expression data from PBDE-47 and DE-71 treated rats at PND4. Public on July 22, 2020.