

# Donovan C. Haines

Professor of Chemistry and Chair

Department of Chemistry

College of Sciences and Engineering Technology

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## Academic Training

Postdoctoral Research, Biochemistry & Biophysics, Lab of Julian A. Peterson, Dept. of Biochemistry, the University of Texas Southwestern Medical Center at Dallas, 1999-2001

Ph.D. in Chemistry (Biological Track), Wichita State University, 1998

B.S. in Biochemistry, Wichita State University, 1993

## Work or Professional Experiences

Professor of Chemistry and Chair: 2020 - current

Associate Professor of Chemistry and Chair: 2019 - 2020

Associate Professor of Chemistry: 2014 - 2019

Assistant Professor of Chemistry: 2008 - 2014

Department of Chemistry, Sam Houston State University, Huntsville, TX

Manage/Direct Research Laboratory: Enzyme cloning, expression, and engineering;  
Toxicology; Synthetic Biology; Forensic Body Farm Research

Undergraduate Courses: Intro. To Organic and Biochemistry (incl. labs), Biochemistry (incl. labs), Organic Chem. (incl. labs), Metabolism/Biochemistry II, Seminar

Graduate Courses: Adv. Biochemistry I, Seminar

Assistant Professor of Chemistry: 2001 - 2008

Department of Chemistry, The University of Texas at Dallas, Richardson, TX

Managed/Directed Research Laboratory: Enzyme cloning, expression, engineering, and spectroscopic and kinetic characterization, organic synthesis, natural product extraction and characterization, quorum sensing bioassay

Undergraduate Courses: Biochemistry, Organic Chem. (incl. labs), Analytical Chem. (incl. labs)

Graduate Courses: Physical Biochemistry, Chemistry Lit. and Comm.

Guest Lectures in: Physical Chem., Bionanotechnology

Postdoctoral Researcher: 1999 - 2001

Julian A. Peterson Laboratory, Department of Biochemistry, the University of Texas Southwestern Medical Center at Dallas, Dallas, TX

Techniques: Site-directed mutagenesis, stopped-flow kinetics, fluorescence spectroscopy, protein crystallography, enzyme cloning and expression, GC/MS, organic synthesis of acyl amino acid substrates, enzymatic eicosanoid synthesis on the 100 mg scale

Graduate Teaching Assistant: 1994 - 1998

*(Last revised 6/29/2023)*

Department of Chemistry, Wichita State University, Wichita, KS

Courses: General Chemistry, Biochemistry, Instrumental Methods, Computer Lab

Graduate Research Assistant:

1994 - 1998

Kandatege Wimalasena Lab., Department of Chemistry, Wichita State Univ., Wichita, KS

Tasks: Organic synthesis of thione-containing enzyme inhibitors, enzyme kinetics, enzyme purification, spectroscopy of enzymes (UV-vis, EPR), mass spec, FPLC (size-exclusion, ion exchange, chromatofocusing) HPLC

## Peer-Review Publications and Artistic Performances/Exhibitions

### Articles (25 total peer-reviewed articles)

Online lists of my publications with links and additional information can be found at

ORCID: <https://orcid.org/0000-0002-7490-725X>

PubMed: <https://www.ncbi.nlm.nih.gov/myncbi/donovan.haines.1/bibliography/public/>

SCOPUS: <https://www.scopus.com/authid/detail.uri?authorId=7201991228>

Zotero: <https://www.zotero.org/donovanhaines>

SciProfiles: <https://sciprofiles.com/profile/2901296>

Remains containment considerations for death in low-Earth orbit. Houser T., Lindgren K.N., Mazuchowski E.L. II, Barratt M.R., Haines D.C., Jayakody M., Blue R.S., Bytheway J.A., Stepaniak P.C. *Aerospace Medicine and Human Performance*, 94, 5, 368–376 (2023)

*In Vitro* Metabolism of Desomorphine, Winborn, J., Haines, D.C., and Kerrigan, S., *Forensic Science International*, 289, 140-9 (2018)

Aluminum-substituted heme domain of P450<sub>BM-3</sub> (BMP): introducing a heme-derived fluorescent probe for the studies of substrate binding and protein-protein interactions in cytochromes P450, Davydov, D.R., Ponomarev G.V., Bobrovnikova E., Jung C., Haines D.C., Peterson J.A., *Biotechnology and Applied Biochemistry*, 60, 1, 41-51 (2013)

Comparison of brain mitochondrial cytochrome c oxidase activity with cyanide LD(50) yields insight into the efficacy of prophylactics, Marziaz M.L., Frazier K., Guidry P.B., Ruiz R.A., Petrikovics I., Haines D.C., *Journal of Applied Toxicology*, 33, 1, 50-5 (2013)

Peroxidase-like activity of uncoupled cytochrome P450: Studies with bilirubin and toxicological implications of uncoupling, De Matteis, F., Ballou, D.P., Estabrook, R.W., and Haines, D.C., *Biochemical Pharmacology*, 84, 3, 374-82 (2012)

A single active-site mutation of P450<sub>BM-3</sub> dramatically enhances substrate binding and rate of product formation., Haines D.C., Hegde A., Chen B., Zhao W., Bondlela M., Humphreys J.M., Mullin D.A., Tomchick D.R., Machius M., Peterson J.A., *Biochemistry*, 50, 39, 8333-41 (2011)

Dominant Paraoxonase 2 is downregulated by the *Pseudomonas aeruginosa* quorum sensing signal N-(3-oxododecanoyl)-L-homoserine lactone and attenuates oxidative stress induced by pyocyanin , Hörke S., Witte I., Altenhöfer S., Wilgenbus P., Goldeck M., Förstermann U., Xiao J., Kramer G.L., Haines D.C., Chowdhary P.K., Haley R.W., and Teiber J.F., *Biochemical Journal*, 426, 73-83 (2010)

- A Single Mutation in P450BM-3 Enhances Acyl Homoserine Lactone : Acyl Homoserine Substrate Binding Selectivity Nearly 250-Fold, Chowdhary, P.K, Stewart, L., Lopez, C., and Haines, D.C., *Journal of Biotechnology*, 135, 374-6 (2008)
- Dominant Role of Paraoxonases in the Inactivation of the *Pseudomonas aeruginosa* Quorum Sensing Signal N-(3-Oxododecanoyl)-L-Homoserine Lactone, Teiber J.F., Horke S., Haines D.C., Chowdhary P.K., Xiao J., Kramer G.L., Haley R.W., Draganov D.I., *Infection and Immunity*, 76, 2512-9 (2008)
- Crystal Structure of Inhibitor Bound P450BM-3 Reveals Open Conformation of Substrate Access Channel, Haines, D.C., Chen, B., Tomchick, D.R., Bondlela, M., Hegde, A., Machius, M., and Peterson, J.A., *Biochemistry* 47, 3662-3670 (2008)
- Bacillus megaterium* CYP102A1 Oxidation of Acyl Homoserine Lactones and Acyl Homoserines, Chowdhary, P.K., Keshavan, N., Nguyen, H., Peterson, J.A., González, J.E., and Haines, D.C., *Biochemistry*, 46, 14429-37 (2007)
- Interactions of Substrates at the Surface of P450s Can Greatly Enhance Substrate Potency, Hegde, A., Haines, D.C., Bondlela, M., Chen, B., Schaffer, N., Tomchick, D.R., Machius, M., Nguyen, H., Chowdhary, P.K., Stewart, L., Lopez, C., and Peterson, J.A., *Biochemistry*, 46, 14010-7 (2007)
- Cloning, Expression And Characterization Of A New Self-Sufficient P450: CYP102A5 From *Bacillus cereus*, Chowdhary, P.K, Alemseghed, M., and Haines, D.C., *Archives of Biochemistry and Biophysics*, 468, 1, 32-43 (2007)
- Obligatory Intermolecular Electron-Transfer from FAD to FMN in Dimeric P450BM-3, Kitazume, T., Haines, D.C., Estabrook, R.W., Chen, B., and Peterson, J.A., *Biochemistry*, 46, 11892-901 (2007)
- A Role for the Strained Phenylalanine Ring Rotation Induced by Substrate Binding to Cytochrome CYP102A1, Haines, D.C., *Protein and Peptide Letters*, 10, 977-80 (2006)
- Modulation of Zinc- and Cobalt-Binding Affinities Through Changes in the Stability of the Zinc Ribbon Protein L36, Kou, W., Kolla, H.S., Ortiz-Acevedo, A., Haines, D.C., Junker, M., and Dieckmann, G.R., *Journal of Biological Inorganic Chemistry*, 10, 167 - 180 (2005)
- L-Canavanine Made by Alfalfa Interferes with Quorum Sensing in *Sinorhizobium meliloti*, Keshavan, N.D., Chowdhary, P.K., Haines, D.C., and Gonzalez, J.E., *Journal of Bacteriology*, 187, 8427 - 8436 (2005)
- pH-Induced Alteration and Oxidative Destruction of Heme in Purified Chromaffin Granule Cytochrome  $b_{561}$ : Implications for the Oxidative Stress in Catecholaminergic Neurons, Wanduragala, S., Wimalasena, D.S., Haines, D.C., Kahol, P.K., and Wimalasena, K., *Biochemistry*, 42, 3617- 3626 (2003)
- Plausible Molecular Mechanism for Fumarate Activation and Electron Transfer of the Dopamine  $\beta$ -Monooxygenase Reaction, Wimalasena, D.S., Jayatillake, S.P., Haines, D.C., and Wimalasena, K., *Biochemical Journal*, 367, 77-85 (2002)
- Practical, Enantiospecific Syntheses of 14,15-EET and Leukotoxin B (Vernolic Acid), Falck, J.R., Reddy, Y.K., Haines, D.C., Reddy, K.M., Krishna, U.M., Graham, S., Murry, B., and Peterson, J.A., *Tetrahedron Letters*, 42, 4131 - 4133 (2001)
- The Pivotal Role of Water in the Mechanism of P450<sub>BM-3</sub>, Haines, D.C., Tomchick, D.R., Machius, M., and Peterson, J.A., *Biochemistry*, 40, 13456 - 13465 (2001)
- The FMN-binding Domain of P450BM-3: Resolution, Reconstitution, and Flavin Analog Substitution, Haines, D.C., Sevrioukova, I.F., and Peterson, J.A., *Biochemistry*, 39, 9419 - 9429 (2000)

- Chiral Multisubstrate Inhibitors of Dopamine  $\beta$ -Monooxygenase: Evidence for Dual Modes of Interaction, Wimalasena, K., Wimalasena, D.S., Dharmasena, S., Haines, D.C., and Alliston, K.R., *Biochemistry*, 36, 7144 – 7153 (1997)
- A General Progress Curve Method for the Kinetic Analysis of Suicide Enzyme Inhibitors, Wimalasena, K. and Haines, D.C., *Analytical Biochemistry*, 234, 175-182 (1996)
- Nucleophilic Substitution Reactions of Phenacyl Bromide Oxime: Effect of the Solvent and the Basicity of the Nucleophile, Wimalasena, K. and Haines, D.C., *Journal of Organic Chemistry*, 59, 6472-6474 (1994)

### Presentations/Posters

- A WSU PhD: Starting Material for a Fascinating Reaction*, Donovan C. Haines, Wichita State University, Nov. 16, 2022.
- The Little N-Gen That Could: A FirstGen Day Presentation*, Donovan C. Haines, Sam Houston State University, Nov. 8, 2022.
- Cytochrome P450: Drug Metabolism, Freeing Lipids with Light, and the Lipids of the Cursed*, Donovan C. Haines, invited seminar at the Dept. of Chemistry, University of Texas at Dallas, Sept. 26, 2019.
- Measurement of volatile metabolites of decomposing human remains by SPME GC/MS*. 74<sup>th</sup> Southwest Regional Meeting of the American Chemical Society, Little Rock, AR, Nov. 7-10, 2018.
- Evidence for Alternate Binding Modes for Short-Chain N-Acylamino Acid Binding to P450<sub>BM-3</sub>*, Society of Toxicology Meeting Poster 3357, San Antonio, TX, March 15<sup>th</sup>, 2018.
- Expanding Laboratory Experience Following Through Avenues of Scientific Methodology*, Lilly Conference on Evidence-Based Teaching and Learning, Austin, TX, January 2017.
- Coupling between the buried active site and surface of P450<sub>BM-3</sub>: The A328S mutation impairs fatty acid oxidation, but enhances N-acylamino acid oxidation*, 72<sup>nd</sup> Southwest Regional Meeting of the American Chemical Society, Galveston, TX, November 2016.
- Interviewed about Forensic analysis on Science VS. Podcast*, 2016, <https://gimletmedia.com/shows/science-vs/z3hl7v/dna-and-the-smell-of-death>
- Metabolomic analysis of volatile organic compounds emitted from decomposing human cadavers*, Joint 71<sup>st</sup> Southwest and Southeast Regional Meeting of the American Chemical Society, Memphis, TN, November 2015.
- Capturing Student Attention: The Benefit of Lecture Capture*, Sam Houston State University PACE Teaching Conference, August 2015.
- GC/MS of Lipids: From P450 Oxidation to the Odor of the Dead*, Dept. of Chemistry, University of Texas at Dallas, January 2015.
- Intro To P450s – Bioinformatics and Enzymology*, SHSU Student Chapter American Society for Microbiology Journal Club, October 2014.
- Oxidizing Enzymes, Lipid Signals, and the unLiving Dead*, SHSU TriBeta, October 2014.
- Xenobiotic Metabolism of Bacterial Acyl Homoserine Lactones*. TargetMeeting 2<sup>nd</sup> World Virology and Microbiology Online Conference, Online, April 2013.
- Man vs Machine: Balancing Tech in the Classroom with a Human Element*. Texas Branch of the American Society for Microbiology Meeting, Waco, TX, October 2012.

- A single residue with dramatic impact on substrate-induced spin-state change in P450BM-3.* Experimental Biology - American Society of Biochemistry and Molecular Biology, San Diego, CA, April 2012.
- A Single Residue with Dramatic Impact on Substrate-Induced Spin-State Change in P450BM-3,* Texas Enzyme Mechanism Meeting, Univ. of Texas School of Pharmacy, Austin, TX, January, 2012.
- Correlation of LD50 and cytochrome c oxidase activity in mitochondria from brains of rodents treated with cyanide and cyanide poisoning antidotes,* 50th Annual Society of Toxicology Meeting in Washington, DC, March 2011.
- Cytochrome P450 Mediated Metabolism of Bacterial Acyl Homoserine Lactones with Implications for Cystic Fibrosis,* Joint 66th Southwest and Southeast Regional Meeting of the American Chemical Society, New Orleans, LA, December 2010.
- Interactions Between Bacterial AHL Quorum Signals and Human Immunomodulatory P450 Cytochromes"* Fall 2010 Meeting of the Texas Society for Microbiology, San Marcos, TX, October 2010.
- Brain mitochondrial cytochrome c oxidase activity as a marker for cyanide intoxication and prophylaxis,* 49th Annual Society of Toxicology Meeting, Salt Lake City, UT, March 2010.
- Acyl Homoserine Lactone Inactivation by Mammalian P450 Enzymes,* Southwest P450 Meeting, Houston, TX, May 2008.
- Cytochrome P450: Drugs, Bugs, and Brains,* Sam Houston State University, Huntsville, TX, November 2007.
- Faster Than a Speeding Bullet: New Insights into CYP102s,* American Chemical Society Midwest Regional Meeting, Kansas City, KS, November 2007.
- Faster Than a Speeding Bullet: New Insights into CYP102s,* Southwest P450 Meeting, Houston, TX, May 2007.
- Cytochrome P450 Oxidation of Acyl Homoserine Lactones in Bacterial Quorum Sensing: Torching Enemy Communication?,* Southern Methodist University, Department of Chemistry, Dallas, TX, March 2006.
- Cytochrome P450: The Master Chemist,* Wichita State University, Department of Chemistry, Wichita, KS, March 2005.
- P450BM-3 (CYP102A1): A Probable Quorum Quencher,* (This award winning invited talk was presented by graduate student Puneet Chowdhary), Southwest P450 Meeting, Houston, TX, May 2004.
- Cytochrome P450: The Master Chemist,* University of Texas at Commerce, Department of Chemistry, Commerce, TX, February 2004.
- From Thin Air: Biomachinery That Uses Oxygen For Defense, Emotion, And Thought* University of Texas at Dallas, Institute for Biomedical Sciences and Technology, Richardson, TX, January 2004.
- Computational AnalysisOf Substrate-Induced Alteration Of Heme-Phenylalanine Interactions In Class III P450s,* Southwest Macromolecular Symposium, Houston, TX, October 2003.
- Computational Analysis of Substrate-Induced Alteration of Heme-Phenylalanine Interactions in Class III P450s,* Southwest P450 Meeting, Houston, TX, May 2003.
- Enzymatic Monooxygenation: From Chemistry To Structural Biology,* Texas Christian University, Department of Chemistry, Fort Worth, TX, October 2001.

## Meeting Presentations/Posters by Students

- Molecular Modelling and Molecular Dynamics Simulations on Murine Cyp4f13: Insight into a Homolog of Human  $\omega$ -Hydroxylase CYP4F3, a Potentiator of Tumor Cell Metastasis*, Jerome W. Butler III and Donovan C. Haines, American Chemical Society 2019 Southwest Regional and Rocky Mountain Regional Meeting, El Paso, TX, Nov. 13-16, 2019.
- Expression of Mouse Leukotriene B4  $\omega$ -Hydroxylase Cyp4f14 in E. coli and Structural Analysis of its Active Site*, Madri M. Jayakody and Donovan C. Haines, American Chemical Society 2019 Southwest Regional and Rocky Mountain Regional Meeting, El Paso, TX, Nov. 13-16, 2019.
- Photocaging technique for the targeted, spatiotemporally controlled release of substances that alter hormone metabolism to improve human health*. Ireland, Kendra; Haines, Donovan C. 2<sup>nd</sup> Annual World Congress on Undergraduate Research (Germany, May 2019).
- Generation and identification of opioid metabolites using CYP102A1 mutants*. Lilledahl, Ruby; Haines, Donovan C. 257<sup>th</sup> ACS National Conference, Orlando, Florida, March 31-April 4, 2019
- Synthesis of palmitoyl L-DOPA, N-acyl fatty amino acid for cytochrome P450 oxidation study*. Ordonez, John; Haines, Donovan C. 74<sup>th</sup> Southwest Regional Meeting of the American Chemical Society, Little Rock, AR, Nov. 7-10, 2018.
- Synthesis and characterization of photo-inducible substrates of P450BM-3*. Ireland, Kendra A.; Haines, Donovan C. 74<sup>th</sup> Southwest Regional Meeting of the American Chemical Society, Little Rock, AR, Nov. 7-10, 2018.
- Identification of Desomorphine in Urine*. Winborn, Jessica; Haines, Donovan, Kerrigan, Sarah. Proceedings of the Society of Forensic Toxicologists, October 2018.
- Phase I Metabolism of Desomorphine*. Winborn, Jessica; Haines, Donovan, Kerrigan, Sarah. Forensic Technology Center of Excellence Webinar Presentation, Sept. 2018.
- Lipids of decomposing mammalian tissues analyzed with GC-MS and ATR-IR*, Bittner, Brianna & Haines, Donovan C., 72<sup>nd</sup> Southwest Regional Meeting of the American Chemical Society, Galveston, TX, November 2016.
- Coupling between the buried active site and surface of P450BM-3: The A328S mutation impairs fatty acid oxidation, but enhances N-acylamino acid oxidation*, Haines, Donovan C., 72<sup>nd</sup> Southwest Regional Meeting of the American Chemical Society, Galveston, TX, November 2016.
- Association Between Volatile Organic Compounds and Microbes Present During the Decomposition of a Cadaver*, Deyne, Todd A., Haines, Donovan C., Lynne, Aaron M., & Bucheli, Sibyl R., American Academy of Forensic Sciences 68<sup>th</sup> Annual Scientific Meeting, Las Vegas, NV, February 2016.
- Time-Dependent Changes in Human and Chicken Bones in Soil Examined by Infrared (IR), Raman, Inductively Coupled Plasma/Optical Emission Spectroscopy (ICP/OES), and Organic Elemental Analysis*, Danker, Matthew J., Haines, Donovan C., & Bytheway, Joan A., American Academy of Forensic Sciences 68<sup>th</sup> Annual Scientific Meeting, Las Vegas, NV, February 2016.
- Association between volatile organic compounds and microbes present during the decomposition of a cadaver*, Deyne, Todd, Haines, Donovan C., Lynne, Aaron, & Bucheli, Sybil, 67<sup>th</sup> Southeast/71<sup>st</sup> Southwest Joint Regional Meeting of the American Chemical Society, Memphis, TN, November 2015.
- Chemical analysis of chicken bone during diagenesis in soil, Danker, Matthew J., Bytheway, Joan, & Haines, Donovan C. , 67<sup>th</sup> Southeast/71<sup>st</sup> Southwest Joint Regional Meeting of the American Chemical Society, Memphis, TN, November 2015.
- Investigation of possible suicide inhibition of cytochrome P450BM-3 by N-fatty acyl amino acids with terminal carbon-carbon triple bonds in their acyl chain*, Yavari, Shadi & Haines, Donovan C., 67<sup>th</sup> Southeast/71<sup>st</sup> Southwest Joint Regional Meeting of the American Chemical Society, Memphis, TN, November 2015.

- Application of golden gate assembly method to combine the catalytic core of luciferase enzyme and fluorescent protein in pETDuet-1 cloning vector to detect protein-protein interactions*, Ratnayake, Thiwanka R. & Haines, Donovan C., 67th Southeast/71st Southwest Joint Regional Meeting of the American Chemical Society, Memphis, TN, November 2015.
- P450BM-3 enzyme activity on acyl homoserine lactone (AHL) and thiolactone (AHTL) quorum sensing signals*, Ariyaratne, Udana V. & Haines, Donovan C., 67th Southeast/71st Southwest Joint Regional Meeting of the American Chemical Society, Memphis, TN, November 2015.
- Expression, isolation and purification of the catalytic core of the luciferase enzyme from Pyrocystis fusiformis*, Rammawadu, Nuwan M., Ngo, Phong D., Coward, Allison B., Loeffler, Paul A., & Haines, Donovan C., 70th Southwest Regional Meeting of the American Chemical Society, Fort Worth, TX, United States, November 2014.
- Study of P450BM3 using N-acylamino acids and N-acylated peptides*, Acharige, Nuwan P. & Haines, Donovan C., 70th Southwest Regional Meeting of the American Chemical Society, Fort Worth, TX, United States, November 2014.
- Association between the volatile organic compounds and the microbes present during the decomposition of a cadaver*, Deyne, Todd, Haines, Donovan, Lynne, Aaron, Bucheli, Sybil, & Haarmann, Daniel, 70th Southwest Regional Meeting of the American Chemical Society, Fort Worth, TX, United States, November 2014.
- Creation of a drug assay by using barbiturate-responsive repressor Bm3R1*, Panangala, Samitha D., & Haines, Donovan C., 69th Southwest Regional Meeting of the American Chemical Society, Waco, TX, November 2013.
- Expression, isolation, and purification of the catalytic core (domain III) of luciferase enzyme in Pyrocystis fusiformis by using pETDUET-1 cloning vector*, Rammawadu, Nuwan M.; Ngo, Phong D., Coward, Allison B., Loeffler, Paul A., & Haines, Donovan C., 69th Southwest Regional Meeting of the American Chemical Society, Waco, TX, November 2013.
- Construction of an acyl homoserine lactone biosensor using synthetic biology techniques*, Coats, Heather R. & Haines, Donovan C., 68th Southwest Regional Meeting of the American Chemical Society, Baton Rouge, LA, November, 2012.
- Dinoflagellate bioluminescence: Cloning and sequence analysis of luciferase from Pyrocystis fusiformis*, Ngo, Phong D., Haines, Donovan C., & Loeffler, Paul A., 67th Southwest Regional Meeting of the American Chemical Society, Austin, TX, November, 2011.
- Do Acyl Homoserine Lactones (AHLs) Compete with Endogenous Immunomodulators by Acting as Substrates for CYP450?*, Castillo, Gabriel & Haines, Donovan C., Experimental Biology 2011, Washington, DC, April 2011.
- Creating a Drug Assay with Synthetic Biology using the Barbiturate-responsive Repressor BM3R1*, Haines, Donovan C. & Coriz, Asheley M., Experimental Biology 2011, April 2011.
- Dinoflagellate Bioluminescence: Cloning of Luciferase Genes and Purification of Luciferase Containing Organelles of Pyrocystis fusiformis*, Ngo, Phong .D., Haines, Donovan C., & Loeffler, Paul A., Texas Academy of Sciences Meeting, Austin, TX, March 2011.
- Probes of P450 mediated metabolism of acyl homoserine lactones*, Senevirathne, Suchithra A. & Haines, Donovan C., Joint 66th Southwest and 62nd Southeast Regional Meeting of the American Chemical Society, New Orleans, LA, December 2010.
- Cytochrome c Oxidase Activity in Cyanide Poisoned Rodents*, Guidry, Paul B., Marziaz, Mandy, Barr, Matthew, & Haines, Donovan C., Joint 66th Southwest and 62nd Southeast Regional Meeting of the American Chemical Society, New Orleans, LA, December 2010.
- Human Xenobiotic Metabolism of Bacterial Acyl Homoserine Lactones*, Kobayashi, Callie R., Bonvillian, Christine, Davis, Amy M., Barr, Matthew, & Haines, Donovan C., Joint 66th Southwest

- and 62nd Southeast Regional Meeting of the American Chemical Society, New Orleans, LA, December 2010.
- Studying the Efficacy of Antidotes for Metabolic Cyanide Poisoning*, Harrison, Mandy, Haines, Donovan C., & Petrikovics, Ilona, Experimental Biology 2010, Anaheim, CA, April 2010.
- Defending Against Infection: Quorum Quenching by Enzymes in Human Liver Microsomes*, Davis, Amy, & Haines, Donovan C., Experimental Biology 2010, Anaheim, CA, April 2010.
- A P450BM-3 Mutation That Impairs Spin-State Conversion Yet Enhances Substrate Oxidation*, Harrison, Mandy, Haines, Donovan, Tomchick, Diana R., & Peterson, Julian, 36th Northeast Regional Meeting of the American Chemical Society, Hartford, CT, October 2009.
- Faster Than a Speeding Bullet: New Insights into Natural Fusion P450s*, Chowdhary, Puneet K. & Haines, Donovan C., 42nd Midwest Regional Meeting of the American Chemical Society, Kansas City, MO, November 2007.
- Cytochrome P450 in Quorum Quenching Pathways: P450BM-3 (CYP102A1) From Bacillus megaterium is an acyl homoserine hydroxylase*, Chowdhary, Puneet, Keshavan, Neela, Haines, Donovan C., Peterson, Julian A., and Gonzalez, Juan. 14th International Conference on Cytochromes P450: Biochemistry, Biophysics, and Bioinformatics, Dallas, TX, May 2005.
- Expression of Cholesterol 24S-Hydroxylase (CYP46) in E. coli*, Luta, Gabriela & Haines, Donovan C., 14th International Conference on Cytochromes P450: Biochemistry, Biophysics, and Bioinformatics, Dallas, TX, May 2005.
- CYP102A1 (P450BM3) a probable quorum quencher*, Chowdhary, Puneet K., Haines, Donovan C., Peterson, Julian A., Gonzalez, Juan E. & Keshavan, Neela D., 60th Southwest Regional Meeting of the American Chemical Society, Fort Worth, TX, October 2004
- A P450 With a Pig-Tail: The Role of Cholesterol 24S-Hydroxylase C-Terminal Prolines*, Hanks, Laura, Luta, Gabriela & Haines, Donovan C., Southwest P450 Meeting, Houston, TX, May, 2004.
- CYP102A1 (P450BM3) a probable quorum quencher*, Chowdhary, Puneet K., Keshavan, Neela D., Haines, Donovan C., Peterson, Julian A., & Gonzalez, Juan E., Southwest P450 Meeting, Houston, TX, May, 2004. (Won best poster award at the meeting.)

### **Honors Theses, MS Theses, and PhD Dissertations Supervised (4 Honors, 19 MS, 3 PhD)**

- Jerome Butler (MS Thesis, Summer 2020), Modelling and Molecular Dynamics on the In Situ Murine Cytochrome P450 4F System
- Madushika "Madri" Jayakoday (MS Thesis, Summer 2020), Structure-Function and Expression Studies Of Mouse CYP4F14 and CYP4F39 and Analysis Of Odor Leakage from Human Remains Containment Units for use in Space.
- Ruby Elisabeth Liliedahl (Undergraduate Honors Thesis, Spring 2019) Preparation and Identification of P450 Metabolites of Dextromethorphan.
- Jessica Winborn (PhD Thesis, Forensic Science, I was co-chair, Fall 2018) Metabolism and Analysis of Desomorphine.
- Cresencio Adame IV and Hamza Uddin (Undergraduate Honors Thesis, Spring 2018) Photo-activatable Substrates of P450 Enzymes with p-Hydroxyphenacyl Compounds.
- Brianna Bittner (MS Thesis, Summer 2017) Lipids Of Decomposing Vertebrate Tissue Analyzed With GC-MS And ATR-IR.
- Todd Deyne (MS Thesis, Spring 2016) Association Between Volatile Organic Compounds And The Microbes Present During The Decomposition Of A Cadaver



- Matthew Danker (MS Thesis, Spring 2016) Time-Dependent Changes In Exhumed Human And Chicken Bone Examined By Infrared Spectroscopy, Inductively Coupled Plasma Optical Emission Spectroscopy, And Elemental Analysis
- Udana Ariyaratne (MS Thesis, Summer 2016) P450<sub>BM-3</sub> Enzyme Activity On Acyl Homoserine Lactone (AHL) And Thiolactone (AHTL) Quorum-Sensing Signals
- Thiwanka Ratnayake (MS Thesis, Summer 2016) Application Of Golden Gate Assembly Method For The Combination Of The Catalytic Core Of Luciferase Enzyme And A Fluorescent Protein In A petDuet-1 Cloning Vector To Enable Detection Of Protein-Protein Interactions
- Shadi Yavari (MS Thesis, Summer 2016) Investigation Of Possible Suicide Inhibition Of Cytochrome P450<sub>BM-3</sub> By N-Fatty Acyl Amino Acids With Terminal Carbon-Carbon Triple Bonds In Their Acyl Chain
- Nuwan Chinthaka Punchi Naide Acharige (MS Thesis, Summer 2015) Evaluation Of Potential Drug Bioassays Based On The Barbiturate-Responsive Repressor Protein BM3R1 Or Existing Quorum Sensing Bioassays, And Synthetic Studies On N-Myristoylglutathione
- Nuwan Rammawadu (MS Thesis, Fall 2014) Expression, Isolation, And Purification Of The Catalytic Core Of The Luciferase Enzyme From *Pyrocystis fusiformis*
- Samitha Panangala (MS Thesis, Summer 2014) Creation Of A Drug Assay By Using Barbiturate-Responsive Repressor BM3R1 And AHL-Quorum Sensing Assays
- Heather Coats (Undergraduate Honors Thesis, Spring 2013) Construction Of An Acyl Homoserine Lactone (AHL) Biosensor Using Synthetic Biology Techniques And The Organic Synthesis Of N-Acylamino Acids
- Jessica Winborn (Undergraduate Honors Thesis, Spring 2013) Using Synthetic Biology To Create A Cyanide Biosensor
- Namini Paranawithana (MS Thesis, Summer 2013) Developing Tools For Probing P450<sub>BM-3</sub> Dimerization Using Synthetic Biology And Förster Resonance Energy Transfer
- Casey Hayslip (Dept. of Biological Sciences MS thesis, I was formally his co-advisor but Anne Gaillard was the primary advisor, Summer 2013) A Biochemical Analysis Of The Quorum Sensing-Like Compounds Secreted By *Chlamydomonas reinhardtii* Involving *Pseudomonas aeruginosa*
- Phong Ngo (MS Thesis, Spring 2012), Dinoflagellate Bioluminescence: The Cloning, Heterologous Expression And Purification Of The Luciferin-Luciferase Bioluminescence System of *P. fusiformis*
- Suchithra Senevirathne (MS Thesis, Spring 2011) Probes Of P450-Mediated Metabolism Of Acyl Homoserine Lactones
- Shirangi Fernando (MS Thesis, Summer 2010) Synthesis And Characterization Of Alkynyl Probes For P450 Fatty Acid Hydroxylase Proteomics
- Mussie Alemseghed (MS Thesis at UTDallas, Summer 2007) Engineering An Efficient Cholesterol Hydroxylase From A Highly Active Fatty Acid Hydroxylase, CYP102A1
- Puneet K. Chowdhary (PhD Dissertation at UTDallas, Fall 2006) Role Of CYP102's In Quorum Quenching Pathways
- Laura Hanks (MS Thesis at UTDallas, Spring 2004) Generation of Cholesterol 24S-Hydroxylase Constructs with a C-Terminal Modification to a Predicted Regulatory Site
- Puneet K. Chowdhary (MS Thesis at UTDallas, Summer 2003) Cloning and Heterologous Expression Of A New Class V P450 Capable Of 7-Ethoxycoumarin O-Dealkylation
- Gabriela Luta (PhD Dissertation at UTDallas, Summer 2003) Heterologous Expression Of Cholesterol 24S-Hydroxylase, CYP46, in *E. coli*

## Funded Grants

### External

*Departmental Grant: Supporting Research at SHSU*, Haines, D.C. (PI), The Robert A. Welch Foundation, 2021-2025, \$200,000

*Equipment Grant: Lab Equipment for Synthetic Biology Teaching and Research*, Haines, D.C. and Gaillard A.R. (Co-PIs), Davidson College GCAT Consortium, Dec 2013, \$11,000 equipment

*Cyanide-gated release of  $\beta$ -mercapto fatty acids for local cyanide-dependent enhancement of bloodflow*, Haines, D.C. (Co-I), subproject of Petrikovics, I.A. (PI) With Thompson, D.A. (Co-I), U.S. Army, 2011-2012, \$15,000 for Haines portion, \$237,844 for overall Army project

*Travel Grant: Travel to GCAT Consortium for Synthetic Biology Training at 2<sup>nd</sup> Annual GCAT Synthetic Biology Workshop*, Haines, D.C. and Gaillard A.R. (Co-PIs), Davidson College GCAT Consortium, 2011, \$800 plus room and board

*Engineering an Efficient Cholesterol Hydroxylase from a Highly Active Fatty Acid Hydroxylase, CYP102A1*, Haines, D.C. (PI), Welch Foundation, Houston, TX, 2005-2008, \$150,000 (when at The University of Texas at Dallas)

*Potential Regulation of Production of Metastasis-Inducing Oxysterol by Interaction of CYP46 with Profilin and GAS7*, Haines, D.C (PI)., American Cancer Society Institutional Research Grant to University of North Texas Health Sciences Center, 2004, \$15,000 (when at The University of Texas at Dallas)

### Institutional

*SHSU Teaching Innovation Grant: General Chemistry II Performance Expectations at Sam Houston State University*, Villalta-Cerdas, A. (PI), Haines, D.C. (CoI) and Hegwood, S (CoI), SHSU STEM Center Teaching Innovation Grant, 2023, \$9000

*SHSU Teaching Innovation Grant: General Chemistry Performance Expectations at Sam Houston State University*, Villalta-Cerdas, A. (PI), Haines, D.C. (CoI), Hegwood, S.L. (CoI), SHSU STEM Center Teaching Innovation Grant, 2022, \$8,940

*The Skin Disease Lamellar Ichthyosis: Enzyme Modeling*, Donovan Haines (PI), SHSU ORSP "Individual Scholarship" 2019, \$4,946

*Active Learning for Enzyme Kinetics in CHEM 3438W*. Haines, D.C. (PI), SHSU STEM Center, 2018, \$3,500

*Enhanced Research Grant: Human Decomposition Volatile Measurement for Microbiological Correlation*, Haines, D.C. and Bucheli, S.R. (Co-PIs), Sam Houston State University ERG Program, 2013, \$15,000

*Faculty Research Grant: Direct Cellular Biosynthesis of Biodiesel*, Haines, D.C. (PI), Sam Houston State University FRG Program, 2009, \$5000

*(Note: There were also numerous institutional awards of travel funds that are not reported here.)*

## Honors and Awards

B.L. Parker Endowed Fellowship, 1995 – 1998  
Wichita State Univ. Outstanding Senior Chemist (ACS), 1994  
National Merit Semifinalist, 1989  
State of Kansas Scholar, 1989

## Other Competencies

2021 – 2023 Member, Campus Connect Advisory Committee  
2019 – 2023 Member, Council of Academic Chairs  
2019 – 2023 Member, Academic Affairs Council (AAC)  
2012 – 2023 Member, SHSU First Year Experience Bearkats Read to Succeed Program Curriculum Infusion Committee Member (2012-17), Book Selection Committee Member (2012-2023), and Event Committee Member (2012-17)  
2022 – 2022 Member, SHSU Impact Research Team – Mobile Credentials  
2021 – 2022 Member, Double Major Advisory Committee  
2010 – 2020 Member, Advisory Board for SHSU Texas Research Institute for Environmental Studies  
2015 – 2020 Member, Southeast Texas Applied Forensic Science Facility Research Committee  
2018 – 2019 Assistant Chair, SHSU Department of Chemistry (promoted to Chair)  
2018 – 2019 Member, SHSU Institutional Animal Care and Use Committee (IACUC)  
2017 – 2019 Member and Faculty Senate Rep., SHSU SACS Reaffirmation Committee  
2015 – 2019 Graduate Coordinator, SHSU MS in Chemistry  
2015 – 2019 Senator, SHSU Faculty Senate (Committee on Committees subcommittee)  
2015 – 2019 Member, SHSU Faculty Research Council  
2016 – 2018 Member, SHSU Excellence in Teaching Award Committee  
2015 – 2018 Member, SHSU Library Committee  
2013 – 2017 Member, SHSU Annual Fund Campaign Committee  
2015 – 2016 Member, SHSU Outstanding Capstone, Thesis, and Diss. Award Committee  
2014 – 2016 Member, SHSU Graduate Council  
2010 – 2016 Member, Advisory Board for Southeast Texas Applied Forensic Science Facility, SHSU  
2015 – 2015 Reviewer (Manuscript), Archives of Biochemistry and Biophysics  
2014 – 2015 Panelist, National Science Foundation Graduate Research Fellowship Program Review Panel  
2014 – 2015 Member, SHSU Excellence in Service Award Committee  
2007 – 2015 Reviewer (Manuscript), Biochemistry  
2010 – 2014 Member, Advisory Board for SHSU Forensic Science Department  
2002 – 2013 Reviewer (Grant Proposal), Alzheimer Association  
2011 – 2011 Reviewer (Manuscript), Dalton Transactions  
2011 – 2011 Reviewer (Manuscript), Protein & Cell  
2010 – 2011 Reviewer (Manuscript), Journal of Phycology  
2010 – 2010 Reviewer (Manuscript), Chemical Reviews  
2010 – 2010 Reviewer (Manuscript), Applied Microbiology and Biotechnology

- 2006 – 2009 Reviewer (Grant Proposal), National Science Foundation
- 2005 – 2008 Coordinator, Univ. of Texas at Dallas Dept. of Chem. Doctoral Qualifying Exam
- 2005 – 2008 Assistant Recruiter, Univ. of Texas at Dallas Department of Chemistry Graduate Program
- 2005 – 2008 Member, Univ. of Texas at Dallas Biosafety Committee
- 2005 – 2008 Reviewer (Manuscript), Journal of the American Chemical Society
- 2002 – 2008 Interviewer, Univ. of Texas at Dallas Health Professions Advisory Committee
- 2006 – 2007 Organizer, Affiliation Between Dept. of Chemistry and Eurasian National University, Astana, Kazakhstan
- 2006 – 2007 Reviewer (Grant Proposal), U.S. Civilian Research and Development Foundation (CRDF)
- 2002 – 2007 Member, Univ. of Texas at Dallas Chemistry Department Web Page Committee
- 2005 Assistant Organizer, 14<sup>th</sup> International Conference on Cytochromes P450 (Dallas, TX)
- 2001 – 2005 Chair, Univ. of Texas at Dallas Chemistry Departmental Seminar
- 2002 – 2003 Demonstrator, Alpha Phi Omega Boy Scout Camp
- 2001 – 2002 Demonstrator, Alpha Phi Omega Science Fair