

Curriculum Vitae
Kathryn D. Mouzakis

Department of Chemistry and Biochemistry
Loyola Marymount University
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EDUCATION AND TRAINING

- Postdoctoral Fellow**, University of Wisconsin – Madison 04/2013 – 07/2013
Mentor: Dr. Samuel E. Butcher
Research: Structural studies of the Israeli acute paralysis virus intergenic IRES pseudoknot I domain by NMR and SAXS.
- Ph.D., Biochemistry**, University of Wisconsin – Madison 09/2007 – 04/2013
Research Advisor: Dr. Samuel E. Butcher
Research: Investigating HIV-1 frameshift site stem-loop structure and function.
- B.S., Chemistry – Biology**, Harvey Mudd College, 09/2003 – 05/2007
Research Advisor: Dr. Karl A. Haushalter
Research: DNA repair efficiency, thermal stability, and substrate specificity of human 8-oxoguanine DNA glycosylase 1 variants.

ACADEMIC EMPLOYMENT

- Associate Professor** 08/2021 – present
Loyola Marymount University
Department of Chemistry and Biochemistry
- Assistant Professor** 08/2018 – 08/2021
Loyola Marymount University
Department of Chemistry and Biochemistry
- Assistant Professor** 08/2013 – 08/2018
Fort Lewis College
Department of Chemistry and Biochemistry

TEACHING/ADVISING

Courses taught: Academic Year (AY), Fall Semester (FA), Spring Semester (SP), Summer (SU):

Loyola Marymount University

Introduction to Virology (CHEM 478)	FA 2019, FA 2021
Biochemistry Lab (CHEM 371)	FA 2018, FA 2020, FA 2021
Chem Seminar (491/490/391/390)	FA 2021
Biology Honors Thesis (BIO 598)	SP 2020, FA 2021
Advanced Biochemistry Lab (CHEM 373)	SP 2020, SP 2021
General Chemistry II Lab (CHEM 113)	SP 2020, SU II 2020, SP 2021

Directed Research (CHEM 397, CHEM 497)	FA 2018 – SP 2021
Advanced Biochemistry (CHEM 372)	SP 2019, SP 2020
Chemistry Teaching: Biochemistry Lab	FA 2020
Biochemistry (CHEM 370)	FA 2018, FA 2019
General Chemistry I Lab (CHEM 111)	FA 2019

Fort Lewis College

General Biochemistry II (CHEM 313)	SP 2015, SP 2017, SP 2018
Fundamentals of Chemistry I Lab (CHEM 150L)	AY 2014 – 2015, FA 2016, SP 2018
Independent Study (CHEM 299 or 499)	AY 2016 – 2017, FA 2017, SP 2018
Seminar I (CHEM 496)	FA 2017
Fundamentals of Chemistry I (CHEM 150)	AY 2013 – 2014, FA 2015, SP 2017
Special Topics in Biochemistry (CHEM 454)	FA 2016
General Biochemistry I (CHEM 311)	AY 2014 – 2015, SP 2016, FA 2016
Advanced Biochemistry Laboratory (CHEM 411)	SP 2014, SP 2016
Fundamentals of Chemistry II (CHEM 151)	SP 2016
Fundamentals of Chemistry II Lab (CHEM 151L)	FA 2015
General Biochemistry Lab (CHEM 312)	FA 2013, FA 2015
Introduction to Chemical Research (CHEM 381)	AY 2013 – 2014, AY 2014 – 2015

Advising:Loyola Marymount University

Mentored 11 undergraduate research students.
 Mentored 28 students participating in an online course-based undergraduate research experience (CURE).
 Supervised 21 student oral/poster presentations.
 Served as academic advisor for 4-12 Chemistry and Biochemistry majors per year, 2018 – 2021.

Fort Lewis College

Mentored 22 undergraduate research students.
 Mentored 31 students participating in an in-person CURE.
 Supervised 21 student oral/poster presentations.
 Served as academic advisor for 8-19 Chemistry and Biochemistry majors per year, 2013 – 2017.

SCHOLARSHIP/CREATIVE WORKSPeer-reviewed Publications (undergraduate co-authors are underlined):

Mitchell, S.F.; **Mouzakis, K.D.** An Approach to Transitioning Undergraduate Biochemistry Laboratory Courses Online. *The Biophysicist* **2021**, 2(2), 1-5.

Thulson, E.; Hartwick, E.W.; Cooper-Sansone, A.; Williams, M.A.C.; Soliman, M.E., Robinson, L.K.; Kieft, J.S.; **Mouzakis, K.D.** An RNA Pseudoknot Stimulates HTLV-1 *pro-pool* Programmed -1 Ribosomal Frameshifting. *RNA* **2020**, 26(4), 512-528.

Mouzakis, K.D.; Wu, T.; Haushalter, K.A. Thermostability and Excision Activity of Polymorphic Forms of hOGG1. *BMC Res Notes* **2019**, 12(1), 92.

Au, H.H.; Cornilescu, G.; **Mouzakis, K.D.**; Burke, J.E.; Ren, Q.; Lee, S.; Butcher, S.E.; Jan, E. Global shape mimicry of tRNA within a viral internal ribosome entry site mediates translational reading frame selection. *PNAS* **2015**, *112*(47), E6446-6455.

Mouzakis, K.D.; Dethoff, E.A.; Tonelli, M.; Al-Hashimi, H.M.; Butcher, S.E. Dynamic Motions of the HIV-1 Frameshift Site RNA. *Biophysical Journal* **2015**, *108*(3), 644-654.

Low, J.T.; Garcia-Miranda, P.; **Mouzakis, K.D.**; Gorelick, R.J.; Butcher, S.E.; Weeks, K.M. Structure and Dynamics of the HIV-1 Frameshift Element RNA. *ACS Biochemistry* **2014**, *53*(26), 4282-4291.

Mouzakis, K.D.; Lang, A.L.; Vander Meulen, K.A., Easterday, P.D.; Butcher, S.E. HIV-1 Frameshift Efficiency is Primarily Determined by the Stability of Base Pairs Positioned at the mRNA Entrance Channel of the Ribosome. *Nucleic Acids Research* **2013**, *41*(3), 1901-1913.

Marcheschi, R.J.; **Mouzakis, K.D.**; Butcher, S.E. Selection and Characterization of Small Molecules that Bind the HIV-1 Frameshift Site RNA. *ACS Chemical Biology* **2009**, *4*(10): 844-854.

Book Chapters:

Mouzakis, K.D.; Burke, J.E.; Butcher, S.E. Investigating RNAs Involved in Translational Control by NMR and SAXS. In *Biophysical Approaches to Translational Control of Gene Expression*; J. D. Dinman (Ed.); Springer New York: London, England, 2013; pp 141-172.

External Grants Awarded:

“Targeting the SARS-CoV-2 Frameshift Site Pseudoknot,” **Kathryn Mouzakis (PI, team lead)**, Amanda Hargrove (PI), Research Corporation for Science Advancement (RCSA) COVID Initiative Award, 06/15/2020 – 06/14/2023, KDM and AEH each received \$55,000 awards.

“Measuring HTLV-1 programmed ribosomal frameshifting *in vivo*,” **Kathryn Mouzakis (Co-PI)**, Jeffrey Kieft (Co-PI), Cottrell Scholars Collaborative Catalyzing Joint Research Award, 05/05/2019 – 05/04/2022, \$3,000.

“Seeding inclusive local networks for domain-specific research and teaching,” **Kathryn Mouzakis (Co-PI)**, Mary Beth Anzovino (Co-PI), Aaron Romanowsky (Co-PI), Cottrell Scholars Collaborative MSI/PWI Partnerships Award, 08/24/2018 – 08/23/2020, \$6,000.

“Structural Basis of -1 Programmed Ribosomal Frameshifting by the Human T-cell Lymphotropic Virus Type I RNA,” **Kathryn Mouzakis (PI)**, RCSA Cottrell Scholar Award, 07/01/2017 – 12/31/2022, \$100,000.

“Structural Basis of -1 Programmed Ribosomal Frameshifting by the Human T-cell Lymphotropic Virus Type I RNA,” **Kathryn Mouzakis (PI)**, NIH Support of Competitive Research (SCORE) Pilot Project Award (SC2), 02/01/2017 – 08/15/2018, \$300,000 awarded (\$225,978 used before the award was relinquished when the PI moved to LMU).

Internal Grants Awarded:

“Travel support to attend the 2019 Cottrell Scholars Conference,” LMU Center for Teaching Excellence Travel Grant, **Kathryn Mouzakis (PI)**, 06/01/2019 – 11/30/2019, \$500.

“Introduction to Virology,” LMU Seaver College Course Development Grant, **Kathryn Mouzakis (PI)**, 07/01/2019 – 10/01/2019, \$5,000.

“Determining the Mechanism of Frameshifting in Human T-cell Leukemia Virus,” Fort Lewis College (FLC) Faculty Development Grant for Traditional Research / Scholarship, **Kathryn Mouzakis (PI)**, 01/01/2014 – 12/31/2017, \$9,450.

“Integrating Undergraduate Research into the Curriculum,” FLC Faculty Development Grant for Teaching Innovation, Pedagogy and Assessment, **Kathryn Mouzakis (PI)**, 10/01/2014 – 12/31/2017, \$4,400.

“Determining the Mechanism of Frameshifting in Human T-cell Leukemia Virus,” FLC Foundation Grant, **Kathryn Mouzakis (PI)**, 01/01/2015 – 12/31/2016, \$4,223.

“Integrating Undergraduate Research into the Curriculum,” FLC Foundation Grant, **Kathryn Mouzakis (PI)**, 01/01/2015 – 12/31/2016, \$3,500.

“Flipped Classrooms at FLC,” FLC Teaching Empowerment Teams, **Kathryn Mouzakis (Co-PI)**, Kenny Miller (Co-PI), Carl Lienert (Co-PI), 09/01/2014 – 12/31/2014, \$500.

“Testing an Active Learning Environment versus Traditional Classroom Lectures in First Semester General Chemistry Courses,” FLC Teaching Empowerment Teams, **Kathryn Mouzakis (Co-PI)**, Aimee Morris (Co-PI), 09/01/2013 – 12/31/2013, \$500.

Presentations (undergraduate co-authors are underlined, presenting author(s) *):

Mouzakis, K.D.*, Soliman, M.E.; Robinson, L.K.; Maille, M.M.; Egekeze, C.C.; Salamon, R.J. “Revealing a Moderate Correlation Between the HTLV-1 *gag-pro* Frameshift Site Stem-loop Thermodynamic Stability and its Frameshift Efficiency,” (poster presentation). American Society for Virology 2022. Madison, WI, USA, July 18, 2022.

Soliman, M.E.; Robinson, L.K.; Maille, M.M.; Egekeze, C.C.; Salamon, R.J.; **Mouzakis, K.D.*** “Revealing a Moderate Correlation Between the HTLV-1 *gag-pro* Frameshift Site Stem-loop Thermodynamic Stability and its Frameshift Efficiency,” (poster presentation). Bioorganic Gordon Research Conference. Andover, NH, USA, June 13, 2022.

Soliman, M.E.; Robinson, L.K.; Maille, M.M.; Egekeze, C.C.; Salamon, R.J.; **Mouzakis, K.D.*** “Revealing a Moderate Correlation Between the HTLV-1 *gag-pro* Frameshift Site Stem-loop Thermodynamic Stability and its Frameshift Efficiency,” (poster presentation). RNA Society 2022. Boulder, CO, USA, June 2, 2022.

Mouzakis, K.D.* “How a basic scientific research program focused on the fundamentals of viral RNA structure-stimulated translational reprogramming pivoted to applied science in response to the SARS-CoV-2 pandemic” (invited oral presentation) Locus Biosciences CRISPR Seminar Series, Durham, NC April 1, 2022.

Mouzakis, K.D.* “An RNA Pseudoknot Stimulates HTLV-1 *pro-pol* Programmed -1 Ribosomal Frameshifting,” (invited oral presentation) 2021 American Society for Biochemistry and Molecular Biology (ASBMB) Annual Meeting: RNA Interest Group - RNA Virology, Online, April 26, 2021.

Mouzakis, K.D.* “An RNA Pseudoknot Stimulates HTLV-1 *pro-pol* Programmed -1 Ribosomal Frameshifting,” (invited oral presentation) The Ohio State University Center for Retrovirus Research Seminar Series, Online, December 17, 2020.

Mouzakis, K.D.* “An RNA Pseudoknot Stimulates HTLV-1 *pro-pol* Programmed -1 Ribosomal Frameshifting,” (invited oral presentation) Cold Spring Harbor Laboratory Virtual Conference: Retroviruses, Online, May 20, 2020.

Mouzakis, K.D.* “Active-learning in SCSE spaces,” (invited oral presentation) LMU Center for Teaching Excellence New Faculty Seminar Series, Los Angeles, CA, USA, October 31, 2019.

Mouzakis, K.D.* “An RNA Pseudoknot Stimulates HTLV-1 *pro-pol* Programmed -1 Ribosomal Frameshifting,” (invited oral presentation) The University of Southern California Chemical Biology Seminar Series, Los Angeles, CA, USA, October 10, 2019.

Thulson, E.; Hartwick, E.W.; Cooper-Sansone, A.; Williams, M.A.C.; Kieft, J.S.; **Mouzakis, K.D.*** “An RNA Pseudoknot Stimulates HTLV-1 *pro-pol* -1 Programmed Ribosomal Frameshifting,” (poster presentation) Keystone Positive-Strand RNA Viruses Symposia, Killarney, Ireland, June 9-13, 2019.

Mouzakis, K.D.* “An RNA Pseudoknot Stimulates HTLV-1 *pro-pol* Programmed -1 Ribosomal Frameshifting,” (invited oral presentation) Haverford Department of Chemistry Seminar Series, Haverford, PA, USA, April 18, 2019.

Mouzakis, K.D.* “Poll Everywhere Technology Integration Workshop,” (invited oral presentation) LMU Center for Teaching Excellence Seminar Series, Los Angeles, CA, USA, February 22, 2019.

Mouzakis, K.D.* “Reprogramming the Ribosome: Programmed Ribosomal Frameshifting in HTLV-1,” (invited oral presentation) The Harvey Mudd College Biology Colloquium, Claremont, CA, USA, September 26, 2018.

Finke, E.A.; Chadeayne, D.P.; Durnford, K.M.; Hartwick, E.W.; Chapman, E.G.; Cooper-Sansone, A.; Williams, M.A.C.; Contreras, U.J.; Davis, S.S.; Greyeyes, S.D.; Knewitz, A.P.; Stelmaszek, J.A.; Atene, A.L.; Joe, N.S.; Dailey, L.A.; Broad, A.; Mackenzie, J.; Kieft, J.S.; **Mouzakis, K.D.*** “An RNA Pseudoknot Stimulates Human T-cell Lymphotropic Virus Type 1 *pro-pol* -1 Programmed Ribosomal Frameshifting,” (poster presentation) RNA 2018: the 23rd Annual Meeting of the RNA Society, Berkeley, CA, USA, May 29 – June 2, 2018.

Mouzakis, K.D.* “Getting Involved in Undergraduate Research,” (invited oral presentation) The FLC ASBMB Student Chapter: Discovering Research Series, Durango, CO, USA, March 13, 2018.

Mouzakis, K.D.* “Solving a Problem of Supply and Demand: Increasing Availability of Undergraduate Research Experiences (UREs) by Integrating Course-based UREs

(CUREs) into the Biochemistry Curriculum,” (invited oral presentation) Cottrell Scholar Conference: More Viewpoints, Better Science, Tucson, AZ, USA, July 12 – 14, 2017.

Mouzakis, K.D.* “Determination of the HTLV-1 *pro-pol* Frameshift Site Secondary Structure,” (poster presentation) Cottrell Scholar Conference: More Viewpoints, Better Science, Tucson, AZ, USA, July 12 – 14, 2017.

Finke, E.A.; Durnford, K.M.; Chapman, E.G.; Cooper-Sansone, A.; Dailey, L.A.; Contreras, U.J.; Broad, A.; Mackenzie, J.; Kieft, J.S.; **Mouzakis, K.D.*** “Determination of the HTLV-1 *pro-pol* Frameshift Site Secondary Structure,” (poster presentation) RNA 2017: the 22nd Annual Meeting of the RNA Society, Prague, Czech Republic, May 30 – June 3, 2017.

Finke, E.A.; Chadeayne, D.P.; Durnford, K.M.; Chapman, E.G.; Davis, S.S.; Greyeyes, S.D.; Knewitz, A.P.; Stelmaszek, J.A.; Broad, A.; Mackenzie, J.; Kieft, J.S.; **Mouzakis, K.D.*** “Determination of the HTLV-1 *pro-pol* Frameshift Site Secondary Structure,” (poster presentation) Gordon Research Conference on Post-Transcriptional Gene Regulation, Stowe, VT, USA, July 10 – 15, 2016.

Mouzakis, K.D.* “An RNA Research-based Advanced Biochemistry Laboratory Course: Design, Implementation, and Outcomes,” (poster presentation) National Meeting of the ASBMB, Boston, MA, USA, March 28 – April 1, 2015.

Mouzakis, K.D.*; Cordes, M.*; Wesley, M.*; Keating, J.*; Jose, G.*; Berger, B.*; Sibley, S.*; Forest, K.T. “A Response to the NSF Call to Action in Undergraduate Biology Education,” (poster presentation) Teaching and Learning Symposium, Madison, WI, USA, May 22-23, 2013.

Mouzakis, K.D.* “The Role of RNA Structural Stability in HIV-1 -1 Programmed Ribosomal Frameshifting,” (invited oral presentation) Department Seminar, Carroll University, Waukesha, WI, USA, October 3, 2012.

Mouzakis, K.D.* “HIV-1 Frameshift Efficiency is Primarily Determined by the Stability of Three Base Pairs Positioned at the mRNA Entrance Channel of the Ribosome,” (invited oral presentation) 17th Annual Meeting of the RNA Society, Ann Arbor, MI, USA, May 29 – June 2, 2012.

Mouzakis, K.D.*; Marcheschi, R.J.; Tonelli, M.; Butcher, S.E. “Orientation and Dynamics of the HIV-1 Frameshift RNA Stem-Loop are Influenced by Counter-Ion and Ligand Interactions.” (Poster presentation) 35th Steenbock Symposium: Advances in Biomolecular NMR, Madison, WI, USA, June 26 – 28, 2011.

Mouzakis, K.D.*; Butcher, S.E. “The Role of the HIV-1 RNA Structure in Frameshifting Suggests Mechanical Stability Generally Regulates Frameshifting via Kinetic Control of Translation,” (poster presentation) Post-transcriptional Control: mRNA Translation, Localization, and Turnover, University of Edinburgh, UK, June 8 – 10, 2010.

Mouzakis, K.D.*; Marcheschi, R.J.; Tonelli, M.; Butcher, S.E. “The Effects of Counter-ions and Ligands on the Orientation and Dynamics of the HIV-1 FS Stem-Loop,” (poster presentation) NIH Meeting of Groups Studying the Structures of AIDS-Related Systems, Bethesda, MD, USA, June 25 – 26, 2009.

Mouzakis, K.D.*; Wu, T.; Haushalter, K.A. “Thermolability and Compromised Excision

Activity of Polymorphic Forms of hOGG1,” (poster presentation) Keystone Symposium on Genome Instability and Repair, Breckenridge, CO, USA, January 17 – 21, 2007.

Student Presentations (undergraduate co-authors are underlined, presenting author(s) *):

Soliman, M.E.*; Robinson, L.K.; Maille, M.M.; Egekeze, C.C.; Salamon, R.J.; **Mouzakis, K.D.** “Determining How Stem-loop Structure Thermodynamic Stability Influences Frameshift Efficiency at the HTLV-1 *gag-pro* Frameshift Site,” (poster presentation). HTLV 22 conference. Online. May 8-11, 2022.

Maille, M.M.*; **Mouzakis, K.D.** “Investigating the Role of Base-Triples in the HTLV-1 *pro-pol* Frameshift Site Pseudoknot,” (poster presentation). HTLV 22 conference. Online. May 8-11, 2022.

Soliman, M.E.*; Robinson, L.K.; Maille, M.M.; Egekeze, C.C.; Salamon, R.J.; **Mouzakis, K.D.** “Determining How Stem-loop Structure Thermodynamic Stability Influences Frameshift Efficiency at the HTLV-1 *gag-pro* Frameshift Site,” (oral presentation). The 45th Annual West Coast Biological Sciences Undergraduate Research (WCBSUR) Conference. San Diego, CA, USA, April 9, 2022.

Covington, A.L.*; **Mouzakis, K.D.** “Examining the Temperature-dependence of HTLV-1 *pro-pol* Programmed -1 Ribosomal Frameshifting,” (poster presentation). The 45th Annual WCBSUR Conference. San Diego, CA, USA, April 9, 2022.

Maille, M.M.*; **Mouzakis, K.D.** “Investigating the Role of Base-Triples in the HTLV-1 *pro-pol* Frameshift Site Pseudoknot,” (poster presentation). The 45th Annual WCBSUR Conference. San Diego, CA, USA, April 9, 2022.

Soliman, M.E.*; Robinson, L.K.; Maille, M.M.; Egekeze, C.C.; Salamon, R.J.; **Mouzakis, K.D.** “Determining How Stem-loop Structure Thermodynamic Stability Influences Frameshift Efficiency at the HTLV-1 *gag-pro* Frameshift Site,” (poster presentation). National Meeting of the ASBMB. Philadelphia, PA, USA, April 2 – 5, 2022.

Maille, M.M.*; **Mouzakis, K.D.** “Investigating the Role of Base-Triples in the HTLV-1 *pro-pol* Frameshift Site Pseudoknot,” (poster presentation) National Meeting of the ASBMB. Philadelphia, PA, USA, April 2 – 5, 2022.

Soliman, M.E.*; Robinson, L.K.; Maille, M.M.; Egekeze, C.C.; Salamon, R.J.; **Mouzakis, K.D.** “Determining How Stem-loop Structure Thermodynamic Stability Influences Frameshift Efficiency at the HTLV-1 *gag-pro* Frameshift Site,” (poster presentation) LMU 14th annual Undergraduate Research Symposium (URS). Los Angeles, CA, USA, March 19, 2022.

Maille, M.M.*; **Mouzakis, K.D.** “Investigating the Role of Base-Triples in the HTLV-1 Pseudoknot,” (poster presentation) LMU 14th annual URS. Los Angeles, CA, USA, March 19, 2022.

Covington, A.L.*; **Mouzakis, K.D.** “Examining the Temperature-dependence of HTLV-1 *pro-pol* Programmed -1 Ribosomal Frameshifting,” (poster presentation) LMU 14th annual URS. Los Angeles, CA, USA, March 19, 2022.

Melton, C.T.*; Hartwick, E.H.; Covington, A.L.; Kieft, J.S.; **Mouzakis, K.D.** “Evaluating the suitability of the pSGDLuc reporter plasmid to measure the HTLV-1 *pro-pol* frameshift efficiency in cells and *in vitro*,” (poster presentation) LMU 14th annual URS. Los Angeles, CA, USA, March 19, 2022.

Soliman, M.E.*; Robinson, L.K.; Maille, M.M.; Egekeze, C.C.; Salamon, R.J.; **Mouzakis, K.D.** “Determining How Stem-loop Structure Thermodynamic Stability Influences Frameshift Efficiency at the HTLV-1 *gag-pro* Frameshift Site,” (oral presentation) 2021 Southern California Conference for Undergraduate Research (SCCUR). Online, November 20, 2021.

Maille, M.M.*; **Mouzakis, K.D.** “Investigating the Role of Base-Triples in the HTLV-1 Pseudoknot,” (poster presentation) 2021 SCCUR. Online, November 15-20, 2021.

Covington, A.L.*; **Mouzakis, K.D.** “Examining the Temperature-dependence of HTLV-1 *pro-pol* Programmed -1 Ribosomal Frameshifting,” (poster presentation) 2021 SCCUR. Online, November 15-20, 2021.

Melton, C.T.*; Hartwick, E.H.; Covington, A.L.; Kieft, J.S.; **Mouzakis, K.D.** “Evaluating the suitability of the pSGDLuc reporter plasmid to measure the HTLV-1 *pro-pol* frameshift efficiency in cells and *in vitro*,” (poster presentation) 2021 SCCUR. Online, November 15-20, 2021.

Stevens, K.A.*; Covington, A.L.; **Mouzakis, K.D.** “Measuring the Human OC43 Coronavirus Frameshift Efficiency,” (poster presentation) The 2021 SACNAS National Diversity in STEM (NDiSTEM) Digital Conference. Online, October 25-29, 2021.

Stevens, K.A.*; Covington, A.L.; **Mouzakis, K.D.** “Measuring the Human OC43 Coronavirus Frameshift Efficiency,” (poster presentation) 2021 Virtual National McNair Conference at UCLA. Online, July 29, 2021.

Egekeze, C.C.*; Soliman, M.E.; Robinson, L.K.; **Mouzakis, K.D.** “Investigating Spacer-length and Effects of RNA Stem-loop Thermodynamic Stability on HTLV-1 *gag-pro* -1 PRF Efficiency,” (oral presentation) LMU 12th annual URS. Online, April 18, 2020.

Soliman, M.E.*; Robinson, L.K.*; Egekeze, C.C.; **Mouzakis, K.D.** “Determining how Stem-loop Structure Thermodynamic Stability Influences Frameshift Efficiency at the HTLV-1 *gag-pro* Frameshift Site,” (poster presentation) LMU 12th annual URS. Online, April 18, 2020.

Robinson, L.K.*; Egekeze, C.C.*; Soliman, M.E.; **Mouzakis, K.D.** “Determining how stem-loop structure thermodynamic stability influences frameshift efficiency at the HTLV-1 *gag-pro* frameshift site,” (poster presentation) 2019 SCCUR. San Marcos, CA, USA, November 23, 2019.

Egekeze, C.C.*; Robinson, L.K.*; Soliman, M.E.*; **Mouzakis, K.D.** “Determination of the Relationship Between Thermodynamic RNA Stem-Loop Stability and Frameshift Efficiency,” (poster presentation) LMU 11th annual URS. Los Angeles, CA, USA, March 23, 2019.

Dailey, L.A.*; **Mouzakis, K.D.** “Assessing the Programmed -1 Ribosomal Frameshifting (-1 PRF) Efficiency of point mutations naturally occurring within the *pro-pol* frameshift site of

HTLV-I,” (invited oral presentation) FLC Undergraduate Research and Creative Activities Symposium, Durango, CO, USA, April 19, 2018.

Cooper-Sansone, A.*; Williams, M.A.C.; Chadeayne, D.P.; Mylroie, E.A.; Contreras, U.J.; Davis, S.S.; Greyeyes, S.D.; Knewitz, A.P.; Stelmaszek, J.A.; Joe, N.S.; Mouzakis, K.D. “Evaluating the importance of pseudoknot formation to HTLV-1 *pro-pol* -1 programmed ribosomal frameshift stimulation,” (poster presentation) National Meeting of the ASBMB, San Diego, CA, USA, April 21 – 25, 2018.

Williams, M.A.C.*; Cooper-Sansone, A.; Chadeayne, D.P.; Mylroie, E.A.; Contreras, U.J.; Davis, S.S.; Greyeyes, S.D.; Knewitz, A.P.; Stelmaszek, J.A.; Joe, N.S.; Mouzakis, K.D. “Exploring the Significance of the Human T-cell Lymphotropic Virus Type-1 *pro-pol* Frameshift Site Pseudoknot,” (poster presentation) National Meeting of the ASBMB, San Diego, CA, USA, April 21 – 25, 2018.

White, E.*; Abrams, T.Y.; Banks, T.; Chadeayne, D.P.; Cooper-Sansone, A.; Contreras, U.J.; Dailey, L.A.; Davis, S.S.; Eades, A.E.; Greyeyes, S.D.; Harrison, J.A.; Hamilton, A.E.; Joe, N.S.; Knewitz, A.P.; Stelmaszek, J.A.; Mylroie, E.A.; Nash, H.P.; Williams, M.A.C.; Mouzakis, K.D. “Evaluation of *pro-pol* Frameshifting Efficiencies for Naturally Occurring Variants of HTLV-1,” (poster presentation) National Meeting of the ASBMB, San Diego, CA, USA, April 21 – 25, 2018.

Cooper-Sansone, A.*; Williams, M.A.C.; Chadeayne, D.P.; Mylroie, E.A.; Contreras, U.J.; Davis, S.S.; Greyeyes, S.D.; Knewitz, A.P.; Stelmaszek, J.A.; Joe, N.S.; Mouzakis, K.D. “Evaluating the importance of pseudoknot formation to HTLV-1 *pro-pol* -1 programmed ribosomal frameshift stimulation,” (poster presentation) FLC Undergraduate Research and Creative Activities Symposium, Durango, CO, USA, April 19, 2018.

Williams, M.A.C.*; Cooper-Sansone, A.; Chadeayne, D.P.; Mylroie, E.A.; Contreras, U.J.; Davis, S.S.; Greyeyes, S.D.; Knewitz, A.P.; Stelmaszek, J.A.; Joe, N.S.; Mouzakis, K.D. “Exploring the Significance of the Human T-cell Lymphotropic Virus Type-1 *pro-pol* Frameshift Site Pseudoknot,” (poster presentation) FLC Undergraduate Research and Creative Activities Symposium, Durango, CO, USA, April 19, 2018.

White, E.*; Abrams, T.Y.; Banks, T.; Chadeayne, D.P.; Cooper-Sansone, A.; Contreras, U.J.; Dailey, L.A.; Davis, S.S.; Eades, A.E.; Greyeyes, S.D.; Harrison, J.A.; Hamilton, A.E.; Joe, N.S.; Knewitz, A.P.; Stelmaszek, J.A.; Mylroie, E.A.; Nash, H.P.; Williams, M.A.C.; Mouzakis, K.D. “Evaluation of *pro-pol* Frameshifting Efficiencies for Naturally Occurring Variants of HTLV-1,” (poster presentation) FLC Undergraduate Research and Creative Activities Symposium, Durango, CO, USA, April 19, 2018.

Finke, E.A.*; Mouzakis, K.D. “Determination of the HTLV-1 *pro-pol* frameshift site RNA secondary structure,” (poster presentation) American Society for Cell Biology, San Francisco, CA, USA, December 3 – 7, 2016.

Finke, E.A.*; Mouzakis, K.D. “Determination of the secondary RNA structure and its importance to the HTLV-1 *pro-pol* frameshift site,” (poster presentation) FLC Undergraduate Research and Creative Activities Symposium, Durango, CO, USA, April 21, 2016.

Salamon, R.J.*; Lee, J.A.; Mouzakis, K.D. “Minimal RNA Sequence Requirement of the HTLV-1 *gag-pro* RNA Frameshift Site,” (poster presentation) FLC Undergraduate Research and Creative Activities Symposium, Durango, CO, USA, April 21, 2016.

Caldera, H.I.*; Chadeayne, D.P.*; Eagle, F.W.*; Martin, E.*; Rios, J.R.*; Walker, M.A.*; Mouzakis, K.D. “Structure and Function of the HTLV-I *pro-pol* frameshift site,” (poster presentation) FLC Undergraduate Research and Creative Activities Symposium, Durango, CO, USA, April 21, 2016.

Absher, N.J.*; Block, C.W.*; Chavez, M.*; Joe, N.*; Lindquist-Kleissler, B.*; Mylroie, E.A.*; Mouzakis, K.D. “Studying the role of RNA secondary structure in Human T-cell Leukemia/Lymphotropic Virus Type 1 (HTLV-1) *gag-pro* -1 programmed frameshift site,” (poster presentation) FLC Undergraduate Research and Creative Activities Symposium, Durango, CO, USA, April 21, 2016.

Chadeayne, D.P.*; Davis, S.S.; Greyeyes, S.D.; Knewitz, A.P.; Stelmaszek, J.A.; Mouzakis, K.D. “Structure and Function of the HTLV-1 *pro-pol* Frameshift Site,” (poster presentation) FLC Undergraduate Research and Creative Activities Symposium, Durango, CO, USA, April 23, 2015.

Durnford, K.M.*; Chapman, E.G.; Atene, A.L.; Broad, A.; Mackenzie, J.; Yeager, D.L.; Kieft, J.S.; Mouzakis, K.D. “Determination of the HTLV-1 *pro-pol* Frameshift Site Secondary Structure,” (poster presentation) FLC Undergraduate Research and Creative Activities Symposium, Durango, CO, USA, April 23, 2015.

Chadeayne, D.P.*; Davis, S.S.; Greyeyes, S.D.; Knewitz, A.P.; Stelmaszek, J.A.; Mouzakis, K.D. “Structure and Function of the HTLV-1 *pro-pol* Frameshift Site,” (poster presentation) National Meeting of the American Society for Biochemistry and Molecular Biology, Boston, MA, USA, March 28 – April 1, 2015.

Durnford, K.M.*; Chapman, E.G.; Atene, A.L.; Broad, A.; Mackenzie, J.; Yeager, D.L.; Kieft, J.S.; Mouzakis, K.D. “Determination of the HTLV-1 *pro-pol* Frameshift Site Secondary Structure,” (poster presentation) National Meeting of the American Society for Biochemistry and Molecular Biology, Boston, MA, USA, March 28 – April 1, 2015.

Chadeayne, D.P.*; Davis, S.S.; Greyeyes, S.D.; Knewitz, A.P.; Stelmaszek, J.A.; Mouzakis, K.D. “Reprogramming the Ribosome: Structure and Function of the HTLV *pro-pol* Frameshift Site RNA,” (poster presentation) FLC NSF FOCUSS Poster Session, Durango, CO, USA, June 23, 2014.

Lake, M.S.*; Lee, A.M.*; Mancha, S.R.*; Mouzakis, K.D. “The Effects of Local and Global RNA Stability on Frameshift Efficiency in the HTLV-II *gag-pro* Frameshift Site,” (poster presentation) FLC Undergraduate Research and Creative Activities Symposium, Durango, CO, USA, April 24, 2014.

Broad, A.J.*; McKenzie, J.T.; Mouzakis, K.D. “Determining the secondary structure of the HTLV *pro-pol* frameshift site using SHAPE chemical probing,” (invited oral presentation) FLC Undergraduate Research and Creative Activities Symposium, Durango, CO, USA, April 24, 2014.

Davis, S.S.*; Greyeyes, S.D.*; Knewitz, A.P.*; Stelmaszek, J.A.*; Mouzakis, K.D. “Does Pseudoknot Formation play a role in HTLV-1 *pro-pol* Frameshift Efficiency?”, (poster

presentation) FLC Undergraduate Research and Creative Activities Symposium, Durango, CO, USA, April 24, 2014.

Atene, A.L.*; Dayish, K.D.*; Warriner, M.M.*; Yeager, D.L.*; Mouzakis, K.D. “Determining the Secondary Structure of HTLV-1 *pro-pol* Frameshift Site using NMR and Native Gel Analysis,” (poster presentation) FLC Undergraduate Research and Creative Activities Symposium, Durango, CO, USA, April 24, 2014.

Undergraduate Research Students Mentored (co-author on a peer-reviewed publication*):

Loyola Marymount University

Mouzakis Lab Member:

Madison Maille (Biochemistry Major, 2023)	2020 – present
Audrey Covington (Biochemistry Major, 2024)	2021-2022
*Mary Soliman (B.S., Biochemistry, 2022)	2019 – 2022
*Leila Robinson (B.S., Biology, 2022)	2019 – 2022
Cole Melton (B.S., Biology, 2022)	2021 – 2022
Jaynia Garcia (B.S., Biochemistry, 2022)	2021
Kristal Stevens (Biochemistry Major, 2023)	2021
Michael Liu (B.S., Biology, 2022)	2020 – 2021
Carolyn Egekeze (B.S., Biology, 2020)	2019 – 2020
Douglas Kitchen (B.S., Biochemistry, 2019)	2018 – 2019
Katerina Harrop (B.S., Biochemistry, 2019)	2018 – 2019

Fort Lewis College

Mouzakis Lab Member:

Walter Potter (B.S., Biochemistry, 2019)	2018
Harry Spencer (B.S., Biochemistry, 2019)	2018
Emily White (B.S., Biochemistry, 2018)	2017 – 2018
*Marcus Williams (B.S., Biochemistry, 2020)	2017 – 2018
*Andrew Cooper-Sansone (B.S., Cellular and Molecular Biology, 2018)	2017 – 2018
*Eliza Finke (B.S., Cellular & Molecular Biology, 2017)	2015 – 2017
Erin Gaffney (B.S., Chemistry – Biochemistry, 2017)	2016 – 2017
Uriah Contreras (B.S., Biochemistry, 2019)	2017
Elena Mylroie (B.S., Chemistry – Biochemistry, 2017)	2017
Rebecca Salamon (B.S., Cellular & Molecular Biology, 2018)	2015 – 2016
Leandrew Dailey (B.S., Biochemistry, 2018)	2016
Devon Chadeayne (B.S., Chemistry – Biochemistry, 2017)	2014 – 2015
Melanie Walker (B.S., Chemistry – Biochemistry, 2016)	2015
Kathryn Durnford (B.S., Cellular & Molecular Biology, 2015)	2014 – 2015
Antonia Atene (B.S., Chemistry – Biochemistry, 2015)	2014 – 2015
Natalie Joe (B.S., Chemistry – Biochemistry, Cellular & Molecular Biology, 2016)	2015
Jamie Lee (NSF FOCUS student, San Juan CC, Associates Degree, 2015)	2015
Austin Derksen (B.S., Cellular & Molecular Biology, 2016)	2015
Grace Sheridan (B.S., Cellular & Molecular Biology, 2016)	2015
Melvina Lake (B.S., Chemistry – Biochemistry, 2015)	2014
Amanda Broad (B.S., Chemistry – Biochemistry, 2015)	2014
Jason Mackenzie (B.S., Chemistry – Biochemistry, 2015)	2014

Undergraduate Students Mentored in a CURE (Local Poster (P) or Oral (O) Conference Presentation):

LMU CHEM 373 SP 2021 / online 28 students	Kayode Akinnitire, Alex Barber, Savana Basconillo, Siri Breckenridge, Lianlen Joy Distor, Sara Esteves, Jaynia Garcia, Annie Heckman, Reed Hessel, Thomas Kelly, Kaitlyn Kennedy, Cat Machado, Quinton Markett, Finn Mercer, Kiana Nues, Sophia Papadopoulos, Natalie Perez, Ohara Riffel, Tess Rodriguez, Alyssa Rosales, Khaliah Sanders, Ariana Say, Mary Soliman, Sidney Starr, Katie Szymanski, Michelle Thaxton, Aaliyah Tyson, Ryan Vargas
FLC CHEM 496 FA 2017 / in-person 8 students	Tara Abrams, Terrance Banks, Leandrew Dailey (O), Austin Eades, Jacob Harrison, Adam Hamilton, Hannah Nash, Emily White (P)
FLC CHEM 411 SP 2016 / in-person 12 students	Nathan Absher (P), Cooper Block (P), Hector Caldera (P), Devon Chadeayne (P), Marlyn Chavez (P), Forrest Eagle (P), Natalie Joe (P), Brent Lindquist-Kleissler (P), Evita Martin (P), Elena Mylroie (P), Jeovanna Rios (P), Melanie Walker (P)
FLC CHEM 411 SP 2014 / in-person 11 students	Antonia Atene (P), Summer Davis (P), Kolette Dayish (P), Allison Knewitz (P), Shawn Greyeyes (P), Melvina Lake (P), Audrianna Lee (P), Serena Mancha (P), Jordan Stelmaszek (P), Marcus Warriner (P), Daniel Yeager (P)

Additional Mouzakis Lab Student Accomplishments:

Audrey Covington: RAINS Undergraduate Research Fellow (SURP 2021); Harbor-UCLA/LMU Summer Research Program (Summer 2022); Currently a B.S. student at LMU.

Madison Maille: LMU Honors Summer Research Fellowship (Summer 2021); RAINS Undergraduate Research Fellow (SURP 2021); LMU Presidential Scholar; Honors Ambassadorial Grant (2022); Amgen Scholars Program at Duke University (Summer 2022); Currently a B.S. student at LMU.

Kristal Stevens: McNair Scholar; Summer Research Opportunities at Harvard (SROH) student (Summer 2022); Currently a B.S. student at LMU.

Jaynia Garcia: American Chemical Society Division of Analytical Chemistry Undergraduate Award in Analytical Chemistry (2022); Currently completing an NIH Intramural NIAID Research Opportunities (INRO) Postbaccalaureate Fellowship.

Cole Melton: LMU Honors Summer Research Fellowship (Summer 2021); RAINS Undergraduate Research Fellow (SURP 2021); LMU Presidential Scholar; Currently a M.D. student at Creighton University School of Medicine.

Mary Soliman: RAINS Undergraduate Research Fellow (SURP 2019, RAINS Fall 2019); Seaver College Summer Opportunities for Advanced Research Fellow (Summer 2021); Peer-reviewed publication co-author; NIH Undergraduate Scholarship Program (UGSP) Recipient; Currently a NIH NCI Postbaccalaureate Fellow (UGSP).

Leila Robinson: LMU Honors Summer Research Fellowship (Summer 2019); RAINS Undergraduate Research Fellow (UROP Spring 2019, SURP 2019, RAINS Fall 2019); Department of Chemistry and Biochemistry Undergraduate Award in Organic Chemistry (2020); Peer-reviewed publication co-author; REU at the Fred Hutchinson Cancer

Research Center (Summer 2021); Honors Ambassadorial Grant (2022); Will begin a research assistant position at the Fred Hutchinson Cancer Research Center in Fall 2022.

Carolyn Egekeze: LMU Undergraduate Honors Thesis (2020); LMU Presidential Citation (2020); Currently completing a NIH Postbaccalaureate IRTA fellowship.

Emily White: FLC Student Travel Grant (2018); Currently applying to M.S programs in Nutrition and/or Genomics.

Marcus Williams: NIH MARC U-STAR Undergraduate Research Fellow (2018); FLC Student Travel Grant (2018); Peer-reviewed publication co-author; Postbaccalaureate Fellowship in Biomedical Engineering at the Johns Hopkins University School of Medicine (2020-2022); Currently a M.D./Ph.D. student in the Joint MSTP at the University of California San Francisco and University of California Berkeley.

Andrew Cooper-Sansone: FLC Student Research, Scholarly and Creative Activities Award (2017); Peer-reviewed publication co-author; Currently a M.S. student in Journalism at the University of Colorado Boulder.

Eliza Thulson (formerly Finke): FLC Undergraduate Honors Thesis (2017); FLC Student Research, Scholarly and Creative Activities Award (2015, 2016); Currently a Ph.D. student in Genetics and Molecular Biology and at the University of North Carolina; Awarded an NSF GRF (2019); Peer-reviewed publication co-author.

Erin Gaffney: FLC Student Research, Scholarly and Creative Activities Award (2016); Ph.D. in Chemistry from the University of Utah (2021); Postdoctoral Research and Data Manager at the University of Utah (2021-2022); Currently working in Patent Law.

Leandrew Dailey: NIH MARC U-STAR Undergraduate Research Fellow (2016); Completed a Postbaccalaureate Research Fellow at Albert Einstein College of Medicine; Currently a Ph.D. student in Chemistry and Chemical Biology at the University of California San Francisco.

Natalie Joe: NIH MARC U-STAR Undergraduate Research Fellow (2014); Ph.D. in Cellular and Molecular Medicine from the Johns Hopkins University School of Medicine (2022).

Grace Sheridan: FLC Student Research, Scholarly and Creative Activities Award (2015); Currently a Medical Laboratory Scientist at Heart of the Rockies Regional Medical Center.

Austin Derksen: FLC Student Research, Scholarly and Creative Activities Award (2015); Currently a student in Psychology at the University of Northern British Columbia.

Rebecca Salamon: NSF Four Corners Undergraduate STEM Success Undergraduate Research Student (2015); Amgen Scholars Program at Washington University in Saint Louis (summer 2017). Currently a Ph.D. student in Genetics at the University of Wisconsin – Madison.

Devon Chadeayne: NSF Four Corners Undergraduate STEM Success Undergraduate Research Student (2014, 2015); FLC Student Research, Scholarly and Creative Activities Award (2014); Current position is unknown.

Kathryn Durnford: FLC Student Research, Scholarly and Creative Activities Award (2014); M.D. and M.B.A. from the University of Utah (2022).

Amanda Broad: FLC Student Research, Scholarly and Creative Activities Award (2014); Ph.D. in Biochemistry and Molecular Biology from Colorado State University (2020); Currently a Scientist at Enliven Therapeutics.

SERVICE

LMU – University Service:

Sabbatical Review Committee	FA 2020 – SP 2021
Honors Advisory Council Interim Member	FA 2020 – SP 2021
Board of Trustees Committee on Academic Affairs Guest Faculty Panel Member	12/06/2020
Sabbatical Review Committee Interim Member	SP 2020

LMU – Seaver College of Science and Engineering Service:

Experience LMU: Connect with Dean Choe, Seaver College of Science and Engineering Panelist	10/19/21
College Curriculum Committee	FA 2019 – FA 2021
Presentation to the Seaver Executive Advisory Board	01/14/2021

LMU – Department of Chemistry and Biochemistry Service:

Chemistry Instructor Search Committee Member	FA 2021
Department Assessment Committee Member	FA 2019 – SP 2021
Department Assessment Committee Interim Member	FA 2018
Department Ad Hoc Committee on Workload Member	FA 2018
Open House and Preview Day Participant	Intermittently
CHEM 190 Presentation	Annually

FLC – University Service:

Faculty Senate Science Representative	AY 2016 – 2018
Safe Zone Ally	AY 2015 – 2018
FLC Business Competition Advisory Board Member	AY 2015 – 2017
New Student Orientation Professor's Perspective Panel Member	FA 2016

FLC – School of Arts and Sciences Service:

Faculty Mentor to two out-of-department Assistant Professors	AY 2016 – 2018
Undergraduate Scholarly and Creative Activities Grant Reviewer	2015 – 2018
Assistant Professor in Mathematics Search Committee Member	FA 2016
Undergraduate Research and Creative Activities Symposium Faculty Liaison	AY 2015 – 2016
Women in Science Student Organization Faculty Advisor	FA 2015
Assistant Professor in Molecular Microbiology Search Committee Member	FA 2014

FLC – Department of Chemistry and Biochemistry Service:

Department Seminar Series Organizer	AY 2014 – 2018
Major Contributor to the Department Assessment Plan	AY 2013 – 2018
Chemistry Club Faculty Advisor	AY 2015 – 2016
Assistant Professor in Physical Chemistry Search Committee Member	FA 2015
Visiting Chemistry Instructor Search Committee Member	SP 2014

Professional Service:

External Evaluator for tenure and promotion (3 letters)	2021-2022
Cottrell Scholar Collaborative Workshop on Alternative Grading Co-organizer	2022
Bioorganic Gordon Research Conference Nucleic Acid Technologies Discussion Lead	06/15/2022
NSF Grant Reviewer for Chemistry and Biology Divisions	2022
Chem Bio Connections Virtual Seminar Series Co-organizer	05/2021 – 08/2021
ACS New Faculty Workshop Facilitator	06/2021
Rustbelt RNA Meeting 2020: Solutions for Promoting DEI in Science Panel Member	10/24/2020
Cottrell Scholars Regional Meeting Committee Member	03/2020 – 07/2020
RCSA Board Meeting Cottrell Scholars Panel Member	02/2019
Cottrell Scholars Collaborative MSI/PWI Partnerships Workshop Facilitator	07/2018
RNA Society Mentor-Mentee Luncheon Mentor	06/2017, 06/2018
Gordon Research Seminar on Post-Transcriptional Gene Regulation Career Panel Member	07/2016
National Academies Mountain West Summer Institute Facilitator	06/2015
American Society for Biochemistry and Molecular Biology (ASBMB) Undergraduate Poster Competition Judge	03/2015

HONORS AND AWARDS

RNA Society Research Fellowship	2022
LMU Honors Program Honorable Mentor Award	2022
ASV Teacher of Undergraduate Students Registration Award	2021, 2022
LMU Ascending Scholar Award	2021
RNA Society Travel Fellowship	2017, 2018
RCSA Cottrell Scholar Award	2017
Gordon Conference Travel Award	2016
FLC New Faculty Teaching Award	2016
ASBMB Faculty Travel Award	2015
National Academies Education Fellow in the Life Sciences	2013 – 2014
University of Wisconsin (UW) – Madison Honored Instructor Award for Teaching Excellence	2012
Howard Hughes Medical Institute Teaching Fellow	2011 – 2012
UW – Madison Biochemistry Travel Award	2010, 2012
UW – Madison Vilas Travel Grant	2010

PROFESSIONAL ACTIVITIES

LMU Proposal Writing Academy Participant	08/2022
Visiting Faculty Associate (NSF ROA supported) in Dr. Amanda Hargrove's Lab at Duke University, Department of Chemistry	06/2022 – 08/2022
ASV Member	2022
RNA Society Member	2012, 2017 – 2020, 2022
ASBMB Member	2015, 2022
Biophysical Society Member	2021
Cottrell Scholars Collaborative Academic Leadership Training Workshop Participant	02/2019

Visiting Scientist (NIH SCORE supported) in Dr. Jeffrey S. Kieft's	05/2018 – 07/2018
Lab at the University of Colorado School of Medicine, Department	05/2017 – 07/2017
of Biochemistry and Molecular Genetics	
Council on Undergraduate Research (CUR) Member	2015
CUR Proposal Writing Institute Participant	07/2015
National Academies Mountain West Summer Institute Participant	08/2013
Biochemical Society Member	2010