

Mikaela D. Stewart, Ph.D.

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EDUCATION

Postdoctoral Fellow, Biochemistry, University of Washington (2017)

Advisor: Prof. Rachel Klevit

Ph.D., Biochemistry/ Biophysics, Texas A&M University (2013)

Advisor: Prof. Tatyana Igumenova

Thesis Title: *Determining the intrinsic properties of the C1B domain that influence PKC ligand specificity and sensitivity to reactive oxygen species*

B.S., Biology, Chemistry Minor, University of Central Arkansas (2007)

Advisor: Prof. Lori Isom

Thesis Title: *Cations stabilize unstacked nucleic acids in DNA and RNA structures*

Summa cum laude

RESEARCH

Grants Received

- TCU Research and Creative Activities Fund recipient (2018, 2019)
- Four TCU Science and Engineering Research Center Grants (2018, 2019)
- NIH interdisciplinary training grant in cancer recipient (2015-2017)
- P.E.O. scholar award: international merit-based fellowship (2012)
- NIH molecular biophysics training grant recipient (2007-2008)

Awards and Honors

- Selected for the UW School of Medicine Postdoc Seminar Series. (2016)
- First runner up in the annual Texas A&M Biochemistry/Biophysics student research competition (two times, 2010 and 2012)
- Experimental nuclear magnetic resonance conference travel grant recipient (2010)
- Biochemistry Graduate Association travel grant recipient (five times, 2008-2013)

Peer-Reviewed Publications (*students mentored)

Pierce SB, Stewart MD, Gulsuner S, Walsh T, Dhall A, Lee MK, McClellan JM, Klevit RE, King MC (2018) Neurodevelopmental consequences of a RING1 mutation disrupting histone H2A ubiquitylation. *PNAS* 115 (7): 1558-1563.

Stewart MD, Zelin E, Dhall A, Walsh T, Upadhyay E, Corn JE, Chatterjee C, King MC, Klevit RE (2018) BARD1 is necessary for ubiquitylation of nucleosomal histone H2A and for transcriptional regulation of estrogen metabolism genes. *PNAS* 115 (6): 1316-1321.

Stewart MD and Igumenova TI (2017) Toggling of diacylglycerol affinity correlates with conformational plasticity in C1 domains. *Biochemistry* 56 (21): 2637-2640.

Stewart MD, *Duncan ED, *Coronado E, Brzovic PS, Klevit RE (2017) Tuning BRCA1 and BARD1 activity to investigate RING ubiquitin ligase mechanisms. *Protein Science* 26 (3): 475-483

Stewart MD, Ritterhoff T, Klevit RE, Brzovic PS (2016) E2 Enzymes: More Than Just Middle Men. *Cell Research* 26: 423–440.

Yang Y, Morales KA, Stewart MD, Igumenova TI (2015) Conditional Membrane Proteins: Solution NMR Studies of Structure, Dynamics, and Function. *eMagRes*, Vol 4: 767–778.

Vittal V, Stewart MD, Brzovic PS, Klevit RE (2015) Regulating the Regulators: Recent Revelations in the Control of E3 Ubiquitin Ligases. *J Biol Chem* 290: 21244-21251.

Stewart MD, Cole TR & Igumenova TI (2014) Interfacial Partitioning of a Loop Hinge Residue Contributes to Diacylglycerol Affinity of Conserved Region 1 Domains. *J Biol Chem* 289: 27653-27664

Stewart M, Dunlap T, Dourlain E, Grant B, McFail-Isom L (2013) Cations Form Sequence Selective Motifs within DNA Grooves via a Combination of Cation-Pi and Ion-Dipole/Hydrogen Bond Interactions. *PLoS ONE* 8(8): e71420

Stewart MD & Igumenova TI (2012) Reactive cysteine in the structural Zn²⁺ site of the C1B domain from PKC α . *Biochemistry* 51: 7263–7277

Shu C, Sung MW, Stewart MD, Igumenova TI, Tan X & Li P (2012) The Structural Basis of Iron Sensing by the Human F-box Protein FBXL5. *Chem Bio Chem* 13: 788-91

Stewart MD, Morgan B, Massi F & Igumenova TI (2011) Probing the determinants of diacylglycerol binding affinity in the C1B domain of protein kinase C α . *J Mol Biol* 408: 949-70

Li X, Lu C, Stewart M, Xu H, Strong RK, Igumenova T & Li P (2009) Structural basis of double-stranded RNA recognition by the RIG-I like receptor MDA5. *Arch Biochem Biophys* 488: 23-33

Invited Talks

Stewart MD, Walsh T, Dhall A, Chatterjee C, King MC, Klevit RE (2019) Uncovering a function beyond folding for the BRCA1 binding partner, BARD1. Platform Presentation at Texas Protein Folders and Function Meeting.

Stewart MD, Zelin E, Dhall A, Walsh T, Upadhyay E, Corn JE, Chatterjee C, King MC, Klevit RE (2018) The role of BARD1 in ubiquitin ligase activity and gene repression functions of BRCA1. Invited Talk. Texas Woman's University Biology Department Seminar Series.

Stewart MD, Dhall A, Chatterjee C, King MC, Klevit RE (2017) BARD1 contributes to substrate specificity and tissue-specific tumor suppression of BRCA1. UW School of Medicine Postdoc Seminar Series.

Stewart MD, Dhall A, Chatterjee C, King MC, Klevit RE (2016) BARD1 contributes to substrate specificity and tissue-specific tumor suppression of BRCA1. Interdisciplinary Cancer Symposium at Fred Hutchinson Cancer Center.

Stewart MD, King MC, Klevit RE (2015) Aiming BRCA1 to find the targets. Interdisciplinary Cancer Symposium at Fred Hutchinson Cancer Center.

Stewart MD (2013) How protein NMR relates to you. P.E.O. Founder's Day.

Stewart MD, Igumenova TI (2012) C1B complete from “A” to zinc: zinc coordination dynamics in a PKC regulatory domain. Biochemistry/Biophysics student research competition.

Stewart MD, Igumenova TI (2010) Conformational dynamics contribute to ligand binding specificity of PKC C1 domains. Biochemistry/Biophysics student research competition.

External Poster Presentations (*students mentored)

Hurd CA*, Morote-Costas B*, Stewart MD (2019) Coming together in the DNA damage response: interactions with the intrinsically disordered region of BRCA1. International Protein Society Meeting.

Witus S, Zelter A, Henry E, Stewart MD, Davis T, Klevit RE (2019) Chromatin as Viewed by Ubiquitin Writers: Determinants of H2A Site Specificity by RING Ubiquitin E3 ligases. International Protein Society Meeting.

Hurd CA*, Stewart MD (2019) In all disorder a secret order: the interactions of the intrinsically disordered region of BRCA1. Texas Protein Folders and Function Meeting.

Stewart MD, Zelin E, Walsh T, Corn JE, King MC, Klevit RE (2018) The role of the “silent” partner, BARD1, in BRCA1 ubiquitin ligase activity. International Protein Society Meeting.

Stewart MD, Brzovic PS, Klevit RE (2015) “Aiming” BRCA1 to find the cellular targets. Genetic Instability and Cancer Symposium.

Stewart MD, Vittal V, Brzovic PS, Klevit RE (2014) A Tale of Two Tails: Studies on C-terminal extensions of ubiquitin-conjugating enzymes. Federation of American Societies for Experimental Biology meeting on ubiquitin and cellular regulation.

Stewart MD, Igumenova TI (2013) Loop dynamics in C1 domains: implications for ligand binding. Texas protein folders meeting.

Stewart MD, Igumenova TI (2012) Loop dynamics in C1 domains: implications for ligand binding. Experimental nuclear magnetic resonance conference.

Stewart MD, Igumenova TI (2011) Dynamics of a zinc coordination site in C1B domain of protein kinase C α . Texas protein folders meeting.

Stewart MD, Igumenova TI (2011) Dynamics of a zinc coordination site in C1B domain of protein kinase C α . Keystone frontiers of NMR biology.

Stewart MD, Morales KA, Igumenova TI (2010) From protein motions to functions: NMR characterization of membrane associating regulatory domains. Texas protein folders meeting.

Stewart MD, Morgan B, Massi F, Igumenova TI (2010) Conformational dynamics and ligand specificity of PKC α C1B domain. A. I. Scott symposium.

Stewart MD, Morgan B, Massi F, Igumenova TI (2010) Conformational dynamics and ligand specificity of PKC α C1B domain. Experimental nuclear magnetic resonance conference.

Undergraduate Honor's Theses Supervised

Jane Lee (2019-Current) Characterization of PALB2 phospho-mimicking mutants.
Davis Martin (2019-Current) Assessing the protein function in PALB2 inherited mutations.
Suzanna Camp (2018-Current) Characterization of BRCA1 / FANCA interface.
Brian Morote-Costas (2017-2019) Characterization of BRCA1 phospho-mimicking mutants.
Khoa Dao (2017-2019) Characterization of P53 and BRCA1 interaction interface.
Natali Shumlak (2016-2018) Characterization of C. elegans BRCA1 and BARD1 homologs.

Independent Research Projects Supervised

Russell Vahrenkamp (2018-2019) Determining the role of the Ube2H tail in function / localization.
Sophia Cosmich (2018-2019) Characterization of human variants in the PALB2/ BRCA1 interface
Courtney Skalley (2017-2019) Specificity of substrate interactions in BRCA1 homologs.
Christine Hurd (2017) Cloning of the BRCA1 binding region in PALB2.
Emily Duncan (2014-2015) Purification and characterization of two novel ubiquitin ligases.
Ernesto Coronado (2014-2015) Purification and characterization of hyperactive BRCA1 variants.

TEACHING

Courses Taught

Instructor – Fundamentals of Biochemistry (Fall 2017-2019, Spring 2018)
BIOL 40513 – Biology Department, Texas Christian University
Instructor – Structural Biology of Drug Design (Spring 2019)
BIOL/CHEM 40523, BIOL 70950, CHEM 60130 - Texas Christian University
Guest Lecturer – Structural biology (Fall 2013-2017)
BIOC 530 - Biochemistry Department, University of Washington
Co-Instructor – Senior seminar: cell signaling in cancer biology (Summer 2016)
BIOL 485 - Biology Department, University of Washington
Guest Lecturer – Biophysics (Spring 2013)
BICH 624 - Biochemistry Department, Texas A&M University
Guest Lecturer – NMR Spectroscopy (Spring 2009)
CHEM 618 - Chemistry Department, Texas A&M University
Recitation Instructor – Comprehensive biochemistry I (Fall 2008)
BICH 410 - Biochemistry Department, Texas A&M University

Teaching Honors

Best teaching assistant of the year (2008)

Professional Development

Protein Society Educators Workshop, International Protein Society Meeting (2018,2019)
Inclusive Communication Workshop, Texas Christian University (2019)
Faculty Bystander Intervention Program, Texas Christian University (2019)
Science Teaching Experience for Postdocs Fellow, University of Washington (2015-2016)

SERVICE

-Session chair for Protein Society Meeting (2018 & 2019)
-Provided peer review for Science Signaling (2016) & Molecular Cell (2015)
-Association for women in science peer mentoring (2015-2016)
-Participated in the UW Health Sciences high school tour program (2015)
-Led a hands-on lab session for the Summer Medical and Dental Education Program (SMDEP) for underrepresented minority undergraduates (2015)
-Incoming graduate student peer mentor (2008-2013)

- Conducted the “Is graduate school right for you?” seminar for the research experience for undergraduates (REU) program (2010, 2011, 2012)
- Biochemistry graduate student association elected officer (2008-2009)