Donald E. Spratt, Ph.D.

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CURRENT AND PAST APPOINTMENTS

2021 – present **Associate Professor**, Gustaf H. Carlson School of Chemistry and Biochemistry
Adjunct Associate Professor, Department of Biology
Clark University • Worcester MA, USA

2015 – 2021 **Assistant Professor**, Gustaf H. Carlson School of Chemistry and Biochemistry
Adjunct Assistant Professor, Department of Biology
Clark University • Worcester MA, USA

2011 – 2015 **Research Associate**, Department of Biochemistry, *Schulich School of Medicine & Dentistry*
University of Western Ontario • London ON, Canada

EDUCATION

2008 – 2011 **Postdoctoral Fellow**, Department of Biochemistry, *Schulich School of Medicine & Dentistry*
University of Western Ontario • London ON, Canada
- Advisor: Dr. Gary S. Shaw
- Project: Structure and Mechanism of the E2 Enzyme CDC34 in Ubiquitylation

2003 – 2008 **Doctorate in Chemistry,** Department of Chemistry, *Guelph-Waterloo Centre for Graduate Work in Chemistry (GWC)²*
University of Waterloo • Waterloo ON, Canada
- Advisor: Dr. J. Guy Guillemette
- Thesis: Calmodulin Binding and Activation of Mammalian Nitric Oxide Synthases

W.B. Pearson Medal for top dissertation in the Department of Chemistry at the University of Waterloo

1999 – 2003 **Bachelor of Science in Biochemistry, Minor in Classical Studies**
Mount Allison University • Sackville NB, Canada

SCHOLARSHIPS, FELLOWSHIPS, AND ACADEMIC AWARDS

2021 John W. Lund Clark Community Achievement Award
2015 – 2018 Carl J. and Anna Carlson Endowed Chair of Chemistry, Clark University
2012 Canadian Institutes of Health Research (CIHR) Postdoctoral Fellowship
2010 – 2011 Natural Sciences & Engineering Research Council of Canada (NSERC) Postdoctoral Fellowship
2008 – 2010 Ontario Ministry of Research and Innovation (OMRI) Postdoctoral Fellowship
2008 W.B. Pearson Medal – award given for top dissertation at the University of Waterloo (Chemistry)
2007 – 2008 Ontario Graduate Scholarship
2007 – 2008 University of Waterloo President's Scholarship
2007 – 2008 University of Waterloo Science Graduate Experience Award
2007 Merck Frosst Biochemistry Award – award given to the top biochemist in the (GWC)²
2007 ASBMB Graduate Travel Award
2007 University of Waterloo Graduate Studies Office Travel Assistantship
2006 – 2007 Ontario Graduate Scholarship in Science and Technology
2004 – 2005 Ontario Graduate Scholarship in Science and Technology
2004 University of Waterloo Graduate Studies Office Travel Assistantship

RESEARCH INTERESTS

The regulation of enzyme catalysis and protein function resulting from specific interactions between two or more proteins plays an integral role in cell division and homeostasis. The development of various human diseases, both genetic and pathogenically linked, can occur when these protein-protein interactions are disrupted or modified. ***My research interests are focused on understanding the molecular basis of human diseases using state-of-the-art techniques to observe and characterize protein-protein interactions in the cell and at the atomic level.*** Understanding how these protein-protein interactions affect an enzyme's ability to make or break bonds and its underlying mechanism is vital to determining possible pharmacological interventions including drug design.

TEACHING EXPERIENCE

Courses Taught @ Clark University:
Instructed undergraduate (junior and senior) and graduate Biochemistry & Molecular Biology (BCMB), Biology (BIOL), and Chemistry (CHEM) majors in lecture and laboratory settings.

Student contact hours per week = ~5 hours/week (in class lecture or laboratory, office hours, appointments, and tutorial sessions)

Semester	Course Number	Course Name	# of Students	Avg. Student Evaluation (out of 5)
Spring 2022	BCMB 272	Biochemistry II		
Spring 2022	BCMB 275	Protein Chemistry		
Fall 2021	CHEM 030	Kitchen Chemistry (lecture, 2 lab sections)		
Fall 2021	BCMB 271	Biochemistry I		
Fall 2021	CHEM 289/389	Res. Methods: LEEPing into a Science Career		
Spring 2021	CHEM 030	Kitchen Chemistry (lecture, 2 lab sections)	24	4.9
Fall 2020	BCMB 275/375	Protein Chemistry	21	4.9
Fall 2020	BCMB 271 Lab	Biochemistry I Lab (3 sections)	16+16+17	4.7
Fall 2020	CHEM 289/389	Res. Methods: LEEPing into a Science Career	22	4.9
Spring 2020	BCMB 272	Biochemistry II	32	4.8
Fall 2019	BCMB 275/375	Protein Chemistry	15	4.8
Fall 2019	CHEM 289/389	Res. Methods: LEEPing into a Science Career	15	4.9
Fall 2019	CHEM 131 Lab	Organic Chemistry I Lab (1 section)	20	5.0
Spring 2019	*On Sabbatical*			
Fall 2018	BCMB 271 Lab	Biochemistry I Lab (3 sections)	6+14+16	4.5
Fall 2018	CHEM 289/389	Res. Methods: LEEPing into a Science Career	28	4.6
Spring 2018	BCMB 272	Biochemistry II	33	4.3
Spring 2018	BCMB 275/375	Protein Chemistry	29	4.2
Fall 2017	BCMB 271	Biochemistry I	52	4.5
Fall 2017	BCMB 271 Lab	Biochemistry I Lab (3 sections)	17+17+18	4.7
Spring 2017	BCMB 272	Biochemistry II	30	4.9
Spring 2017	BCMB 275/375	Protein Chemistry	16	4.9
Fall 2016	BCMB 271	Biochemistry I	52	4.8
Fall 2016	BCMB 271 Lab	Biochemistry I Lab (3 sections)	20+14+18	4.8
Spring 2016	BCMB 272	Biochemistry II	33	4.4
Spring 2016	BCMB 275/375	Protein Chemistry	20	4.5
Fall 2015	BCMB 271	Biochemistry I	50	4.6

- 100- and 200-level courses are for undergraduate students, 300-level courses are for graduate students
- BCMB 271/371, BCMB 272/371 and BCMB 275/375 are cross-listed for Biology and Chemistry majors (i.e. BCMB 275 is also listed as BIOL 275 and CHEM 275), CHEM 010 is a science perspective course for non-science majors
- For lecture courses, the professor grades and conducts weekly student meetings outside of lecture or lab (i.e. office hours, appointments, and tutorial sessions). There are no Teaching Assistants (TAs). This time commitment is typical for faculty at Clark University.
- For lab courses, the professor teaches the weekly pre-lab and oversees the in-lab time. TAs and Peer Learning Assistants (PLAs) are available to assist during the lab sections and to grade lab reports.

Graduate Student Research Mentor @ Clark University:

Trained and mentored Ph.D. and accelerated M.S. students in the Biochemistry & Molecular Biology (BCMB), Chemistry (CHEM) and Biology (BIOL) programs

Student's position after completing their graduate studies at Clark

Current Ph.D. students

Steven Beasley (BCMB, August 2016 – present)
Emma Kane (BCMB, August 2019 – present)
Kelly Waters (BCMB, August 2020 – present)
Ruben Neves (BCMB, August 2018 – on hiatus)
Physician Assistant Student, Rutgers University (Newark, NJ)

Past Ph.D. students

Yaya Wang – BCMB Ph.D. '17
Assistant Professor, Xi'an University of Science & Tech (Xi'an, China)

Current Accelerated M.S. students

Sean Munroe (BCMB, June 2020 – present)
Elizabeth Bosia (BCMB, June 2021 – present)
Rafael Levin (BCMB, June 2021 – present)
Slesha Shrestha (BCMB, June 2021 – present)
Tyler Vincent (BCMB, June 2021 – present)

Past Accelerated M.S. students

Justine Bohl – BCMB M.S. '20
Associate Scientist II, LakePharma, Inc. (Hopkinton, MA)
Young Sun Lee – BCMB M.S. '20
M.D. Student, U New England COM (Biddeford, ME)
Rylee Simons BCMB M.S. '20
Research Associate, Ultragenyx, Inc. (Woburn, MA)
Aaron Bogle – BCMB M.S. '19
Research Associate, Cedilla Therapeutics, Inc. (Cambridge, MA)
Misa Mai – BCMB M.S. '19
Associate Scientist, NIH-NIAID (Gaithersburg, VA)
Rachel Orlomoski, BIOL M.S. '18
Scientist I - Protein Eng., AbbVie, Inc. (Worcester, MA)
Noah Schwaegerle, BCMB M.S. '18
Research Associate, Intellia Therapeutics, Inc. (Cambridge, MA)
Emily Ladda – BCMB M.S. '20
M.D. Student, VCOM-Carolinas (Spartanburg, SC)
Kayla Rich – BCMB M.S. '20
Ph.D. student, University of California – Los Angeles (Los Angeles, CA)
Diana Argiles-Castillo – BCMB M.S. '19
Research Associate II, Dana-Farber Cancer Institute (Cambridge, MA)
Jeanmarie Loss – BCMB M.S. '19
Scientist R&D, LifeSensors, Inc. (Malvern, PA)
Lara Prosterman – BCMB M.S. '19
Research Associate, Buck Institute (Navato, CA)
Emilie Ogisu, BIOL M.S. '18
Research Associate, Affinivax, Inc. (Cambridge, MA)
Ashley Burke – BCMB M.S. '17
Scientific Associate, Novartis Institutes for BioMedical Research (Cambridge, MA)

Undergraduate Student Research Mentor @ Clark University:

Trained and mentored B.A. undergraduate students in the Biochemistry & Molecular Biology (BCMB) and Biology (BIOL) programs
Student contact hours per week = 5-10 hours (including group meetings/journal club, 1-on-1 meetings, and in-lab interactions)
Student's position after completing their undergraduate studies at Clark

Current Undergraduate Students (Honors, BCMB 297)

Marimo Oka (BCMB Jr., Jan 2020 – present)

Current Undergraduate Students (Directed Study, BCMB 299)

Mia Advocate (BCMB Sr., Jan. 2020 – present)
Greg Amador (BCMB Sr., Jan 2020 – present)
Ilina Ivanova (BCMB Sr., Feb 2021 – present)
Ivana Lopez Nieves (BCMB Sr., Feb. 2021 – present)
Annie Schafer (BCMB Sr., Oct. 2019 – present)

Current Undergraduate Research Volunteers (CHEM 199)

Katie Gross (BCMB Sr., Sept. 2019 – present)
Maritta Kawmi (CHEM Jr., Aug 2020 – present)

Past Undergraduate Students (Honors, BCMB 297)

Rafael Levin (BCMB B.A. '21, Highest Honors)
M.S. student, Clark University (Worcester, MA)
Nick Mathieu (ACS CHEM B.A. '21, Highest Honors)
Ph.D. student, Western University (London, ON, Canada)
Sean Munroe (BCMB B.A. '20, Highest Honors)
M.S. student, Clark University (Worcester, MA)
Emily Ladda (BCMB B.A. '19, High Honors)
M.S. student, Clark University (Worcester, MA)
Kayla Rich (BCMB B.A. '19, High Honors)
M.S. student, Clark University (Worcester, MA)
Rylee Simons (BCMB B.A. '19, Highest Honors)
M.S. student, Clark University (Worcester, MA)

Past Undergraduate Students (Directed Study, BCMB 299)

Sarah Berube (BCMB B.A. '20)
M.B.A. student, Clark University (Worcester, MA)
Elizabeth Bosia (BCMB Sr., Aug. 2020 – present)
M.S. student, Clark University (Worcester, MA)
Slesha Shrestha (BCMB Sr., Aug. 2020 – present)
M.S. student, Clark University (Worcester, MA)
Tyler Vincent (BCMB Sr., Aug. 2020 – present)
M.S. student, Clark University (Worcester, MA)
Victoria White (BCMB Sr., graduating in '21)
TBD
Vivian Thu (BCMB B.A. '20)
Internal Medicine Medical Scribe, Massachusetts General Hospital (Boston, MA)

Diana Argiles-Castillo (BCMB B.A. '18, Highest Honors)
M.S. student, Clark University (Worcester, MA)
Jordan Majka (BCMB B.A. '18, High Honors)
** co-supervised with Dr. David McManus @ UMMS)*
Clinical Research Assistant, Boston Clinical Trials (Boston, MA)
Roela Bardhi (BCMB B.A. '17, Highest Honors)
Pharm.D. student, MCPHS (Worcester, MA)
Pinky Htun (BCMB B.A. '17, Honors)
Research Associate, Moderna (Cambridge, MA)
Vladislav Kiveliyk (BCMB B.A. '17, High Honors)
M.B.A. student, Clark University (Worcester, MA)
Noah Schwaegerle (BCMB B.A. '17, Highest Honors)
M.S. student, Clark University (Worcester, MA)

Past Undergraduate Summer Student Volunteers
Nicholas MacArthur (CHEM B.A. '16, Highest Honors)
Research Associate at Charles River Laboratories (Shrewsbury, MA)

Justine Bohl (BCMB B.A. '19)
M.S. student, Clark University (Worcester, MA)
Chloe Kellum (BCMB B.A. '19)
M.D. student, West Virginia Medical School (Morgantown, WV)
Young Sun Lee (BCMB B.A. '19)
M.S. student, Clark University (Worcester, MA)
Aaron Bogle (BCMB B.A. '18)
M.S. student, Clark University (Worcester, MA)
Jeanmarie Loss (BCMB B.A. '18)
M.S. student, Clark University (Worcester, MA)
Misa Mai (BCMB B.A., '18)
M.S. student, Clark University (Worcester, MA)
Ethan Ziemba (BCMB B.A., '18)
M.B.A. student, Clark University (Worcester, MA)
Lara Prosterman (BCMB B.A. '17)
M.S. student, Clark University (Worcester, MA)
Rachel Orlomoski (BIOL B.A.'17)
M.S. student, Clark University (Worcester, MA)
Emilie Ogisu (BIOL B.A. '17)
M.S. student, Clark University (Worcester, MA)
Andres Torres (BIOL B.A.'17)
M.D. student, University of Puerto Rico (San Juan, PR)
Feston Idrizi (BCMB B.A. '16)
Research Technician, UMass Medical School (Worcester, MA)
Sarah Lach (BCMB B.A. '17)
Ph.D. student, University of Texas at Houston (Houston, TX)
Alexandra Brown (BCMB B.A. '17)
Laboratory Technician, Yale University (New Haven, CT)
Janel Gardner (BCMB B.A. '17)
Laboratory Technician, MD Anderson Cancer Center (Houston, TX)
Noor Alzuhairy (BCMB B.A. '17)
Pharmacy Assistant at Walmart (Worcester, MA)

Undergraduate Summer Student Research @ Clark University:
Mentored undergraduate Biochemistry & Molecular Biology and Biology majors working in my laboratory. Each of these students were trained in a variety of biochemical and biophysical techniques (late May – early August).

Summer 2021: *AbbVie Summer Scholars* – Elizabeth Bosia, Slesha Shrestha, Tyler Vincent
Edwin A. Weiller Summer Scholars – Greg Amador, Annie Schafer
Beavers Summer Scholar – Marimo Oka
Maureen H. Milburn Summer Scholar – Luke Mazur

Summer 2020: *AbbVie Summer Scholar* – Sean Munroe
Arthur E. Martell and Thomas T. Sugihara Summer Scholar – Nick Mathieu
Maureen H. Milburn Summer Scholar – Annie Schafer

Summer 2019: *AbbVie Summer Scholar* – Kayla Rich
NIH Summer Scholars – Justine Bohl, Emily Ladda, Young Sun Lee
Clark University Startup Summer Scholar – Rylee Simons

Summer 2018: *AbbVie Summer Scholar* – Diana Argiles-Castillo
Maureen H. Milburn Summer Scholars – Justine Bohl, Emily Ladda, Young Sun Lee
NIH Summer Scholars – Aaron Bogle, Jeanmarie Loss, Misa Mai
Sherman Fairchild Summer Scholars – Chloe Kellum, Kayla Rich, Rylee Simons

Summer 2017: *Sherman Fairchild Summer Scholars* – Diana Argiles-Castillo, Aaron Bogle
James & Ada Bickman Summer Scholar – Chloe Kellum
Liberal Education & Effective Practice (LEEP) Summer Scholars – Young Sun Lee, Emilie Ogisu, Lara Prosterman, Noah Schwaegerle

Summer 2016: *Sherman Fairchild Summer Scholars* – Pinky Htun, Emilie Ogisu, Lara Prosterman
Clark University Traina Scholars – Roela Bardhi, Noah Schwaegerle
James & Ada Bickman Summer Scholar – Vladislav Kiveliyk
Liberal Education & Effective Practice (LEEP) Summer Scholars – Noor Alzuhairy, Janel Gardner, Feston Idrizi

High School Summer Student Research @ Clark University:
Mentored High School Students interested in working in biochemistry research laboratory. Each of these students were trained in a variety of biochemical and biophysical techniques (July – August).

Summer 2019: Massachusetts Life Sciences Center – Peter Chelstowski (Worcester Technical High School)

Teaching Experience Prior to Joining Clark University

Sept. 2008 – June 2015 Mentoring of Students**,** Western University
Trained and mentored 17 graduate students and 9 undergraduate students during their honors theses or summer projects

Sept. 2003 – April 2008 Undergraduate Training Co-supervisor, University of Waterloo
Co-supervised, trained and mentored 9 undergraduate students during their honors theses or CO-OP placement

Sept. 2003 – April 2008 Teaching Assistant, University of Waterloo
Assisted and supervised undergraduate students, led tutorial sessions, and marked assignments and exams.

Courses – 110 hours/term (# of students per term, student assessment /4.8):
CHEM 430 – Biochemical Pharmacology (~40 students)
- Pharmacodynamics, pharmacokinetics, drug design and metabolism, and the pharmacology of nitric oxide.

CHEM 433 – Advanced Biochemistry (~30 students)
- Nitrogen fixation, assimilation of nitrogen, amino acid metabolism, metabolic regulation, proteolytic enzymes, ubiquitin, blood coagulation, signal transduction and amplification.

CHEM 331 – Fundamentals of Metabolism 1 (~50 students)
- Thermodynamics of metabolism. Metabolism of carbohydrates and lipids.

CHEM 333 – Metabolism 1 (~120 students)
- Metabolic pathways of carbohydrates, lipids and amino acids.

CHEM 335L – Advanced Biochemistry (laboratory • ~20 students, 4.5/4.8)
- NMR, allostery, enzymology, electrophoresis, carbohydrates, lipids, photosynthesis, and respiration.

CHEM 233 – Fundamentals of Biochemistry, (~80 students)
- Chemistry of amino acids, carbohydrates, lipids and nucleic acids, and enzymes.

CHEM 237 and 237L – Introductory Biochemistry (~200 students, 4.4/4.8)
- Introduction to the chemistry of amino acids, carbohydrates, lipids, proteins and nucleic acids.

Jan. 2006 – April 2008 Tutor – Centre for Accessible Learning, Wilfrid Laurier University • Waterloo ON, Canada

PUBLICATIONS

In my scientific field, the principal investigator is always listed last in authorship. Student authors are listed first in order of their contributions, followed by any non-principal investigator faculty member.

✪Principal Investigator, ⦿Collaborative Investigator, ★Graduate Students from ClarkU, ❁Undergraduate Students from ClarkU

Articles Published in Refereed Journals from Work Done @ Clark University:

37. ❁Mathieu, N., ⦿Paparisto, E., ⦿Barr, S.D., and ✪**Spratt, D.E.** (2021) HERC5 and the ISGylation pathway: critical modulators of the antiviral immune response. *Special Issue – Ubiquitin and ubiquitin-like pathways in viral infection (invited review), Viruses*, **13**, 1102.
36. ❁Mathieu, N.A., ❁Levin, R.H., and ✪**Spratt, D.E.** (2021) Exploring the role of HERC2 and NEDD4L HECT E3 ubiquitin ligases in p53 signaling and the DNA damage response. *Special Topics – Cancer Molecular Targets and Therapeutics (invited review), Frontiers in Oncology,* **11**, 659049.
35. ★Kane, E.I., and ✪**Spratt, D.E.** (2021) Structural insights into ankyrin repeat-containing proteins and their influence in ubiquitylation. *Special Issue – Ubiquitin-conjugating or deubiquitinating enzymes in signal transduction pathways* (invited review)*, Int. J. Mol. Sci.,* **22***,* 609.
34. ★Beasley, S.A., ❁Kellum, C., ❁Orlomoski, R., ❁Idrizi, F., and ✪**Spratt, D.E.** (2020) An Angelman Syndrome substitution in the HECT E3 ubiquitin ligase C-terminal lobe of E6AP affects protein stability and activity. *PLoS ONE,* **15**, e0235925*.*
33. ★Wang, Y., ❁Argiles Castillo, D., ★Kane, E.I., ⦿Zhou, A., and ✪**Spratt, D.E.** (2020) HECT E3 Ubiquitin Ligases: biological roles, identified interactions, and relevance to disease. (invited review) *J. Cell Sci.,* 10.1242/jcs.228972.
32. ⦿Ries, L.K., ⦿Liess, A.K.L., ⦿Feiler, C., ⦿**Spratt, D.E.**, ⦿Lowe, E., and ⦿Lorenz, S. (2020) Crystal structure of the catalytic C-lobe of the HECT-type ubiquitin ligase E6AP. *Protein Sci.*, 10.1002/pro.3832*.*
31. ★Orlomoski, R., ★Bogle, A., ★Loss, J., ❁Simons, R., ⦿Dresch, J.M., ⦿Drewell, R.A., and ✪**Spratt, D.E.** (2019) Rapid and efficient purification of homeodomain transcription factors for biophysical characterization. *Protein Exp. Purif.*, **158**, 9-14*.*

30. ★Beasley, S.A., ❁Bardhi, R., and ✪**Spratt, D.E.** (2019) ^{1}H, ^{13}C, and ^{15}N resonance assignments the C-terminal lobe of the human HECT E3 ubiquitin ligase ITCH. *Biomol. NMR Assign.,* **13**, 15-20.
29. ★Krasinski, C.A., ★Zheng, Q., ★Ivancic, V., ⦿**Spratt, D.E.**, and ⦿Lazo, N.D. (2018) Resveratrol sustains insulin-degrading enzyme activity toward Aβ42. *ACS Omega,* **3**, 13275-13282.
28. ★Ivancic, V., ★Krasinski, C.A., ⦿**Spratt, D.E.**, and ⦿Lazo, N.D. (2018) Enzyme kinetics from circular dichroism of insulin reveals mechanistic insights into the regulation of insulin-degrading enzyme. *Bioscience Reports,* **38**, BSR20181416.
    - ❖ A commentary was written highlighting the methodology developed in this article (*Biosci. Rep.* BSR20181555)
27. ★Krasinski, C.A., ★Zheng, Q., ★Ivancic, V., ⦿**Spratt, D.E.**, and ⦿Lazo, N.D. (2018) The longest amyloid-β precursor protein intracellular domain produced with Aβ42 forms β-sheet-containing monomers that self-assemble and are proteolyzed by insulin-degrading enzyme. *ACS Chemical Neuroscience,* **9**, 2892-2897.
26. ★Beasley, S.A., ★Wang, Y., and ✪**Spratt, D.E.** (2017) RBR E3 Ubiquitin Ligases. *Encyclopedia of Signaling Molecules, 2nd Ed.*

Published Chapters from Work Done @ Clark University:

25. ★Kane, E.I. and ✪**Spratt, D.E.** (2020) New discoveries on the roles of 'other' HECT E3 ubiquitin ligases in disease development (invited chapter) *Ubiquitin – Proteasome Pathway (ISBN: 978-1-83880-841-9),* 10.5772/intechopen.91770.

Articles Published in Refereed Journals from Work Done @ Western University (Postdoc/Research Associate):

24. **Spratt, D.E.**, Barber, K.R., Marlatt, N.M., Ngo, V., Macklin, J.A., Xiao, Y., Konermann, L., Duennwald, M.L., and Shaw, G.S. (2019) A subset of calcium-binding S100 proteins show preferential heterodimerization. *FEBS Journal,* **286**, 1859-1876.
23. George, S., Aguirre, J.D., **Spratt, D.E.**, Bi, Y., Jeffery, M., Shaw, G.S., and O'Donoghue, P. (2016) Generation of phosphor-ubiquitin variants by orthogonal translation reveals codon skipping. *FEBS Letters,* 590,1530-42.
22. Wu, K., Chong, R.A., Yu, Q., Bai, J., **Spratt, D.E.**, Ching, K., Lee, C., Miao, H. Zheng, N., Shaw, G.S., Sun, Y., Felsenfeld, D.P., Sanchez, R., Zheng, J.-N., and Pan, Z.-Q. (2016) Suramin inhibits cullin-RING E3 ubiquitin ligases. *Proc. Natl. Acad. Sci. U.S.A.*, 113, E2011-8.
21. Kumar, A., Aguirre, J.D., Condos, T.E.C., Martinez-Torres, R.J., Chaugule, V.K., Toth, R., Sundaramoorthy, R., Mercier, P., Knebel, A., **Spratt, D.E.**, Barber, K.R., Shaw, G.S., and Walden, H. (2015) Disruption of the autoinhibited state primes the E3 ligase parkin for activation and catalysis. *EMBO J.,* **34**, 2506-2521.
    - ❖ This article was selected for the cover of the October 2015 edition and News & Views of *EMBO J* ((2015) **32**, 2486-2488)
20. **Spratt, D.E.**, Walden, H., and Shaw, G.S. (2014, invited review) RBR E3 ubiquitin ligases: new structures, new insights, new questions. *Biochem. J.* **458**, 421-437.
    - ❖ This invited review has been downloaded over 7000 times since March 2014 and is the 2nd most downloaded review from the *Biochemical Journal* in the past 4 years.
19. Chong, R.A., Wu, K., **Spratt, D.E.**, Yang, Y., Lee, C., Nayak, J., Xu, M., Elkholi, R., Li, J., Brown, B.D., Chipuk, J.E., Chen, Z., Sanchez, R., Shaw, G.S., Huang, L., and Pan, Z.-Q. (2014) Pivotal role for the ubiquitin Y59-E51 loop in lysine-48 polyubiquitination. *Proc. Natl. Acad. Sci. U.S.A.* **111**, 8434-8439.
18. Kovacev, J., Wu, K., **Spratt, D.E.**, Chong, R.A., Nayak, J., Shaw, G.S., and Pan, Z.-Q. (2014) A snapshot at ubiquitin chain elongation: Lysine 48-tetra-ubiquitin slows down ubiquitination. *J. Biol. Chem.* **289**, 7068-7081.
17. **Spratt, D.E.**, Martinez-Torres, R.J., Noh, Y.J., Mercier, P., Manczyk, N., Barber, K.R., Aguirre, J.D., Burchell, L., Purkiss, A., Walden, H., and Shaw, G.S. (2013) A molecular explanation for the recessive nature of *parkin*-linked Parkinson's disease. *Nat. Commun.* **4**, 1983.
    - ❖ Discussed in two *News & Views* articles in *EMBO J* ((2013) **32**, 2087-2089) and *Current Biology* ((2013) **23**, R691-R693).
    - ❖ Highlighted on the *Michael J. Fox Foundation for Parkinson's Research* Website (August 1, 2013). https://www.michaeljfox.org/foundation/news-detail.php?parkin-big-year-four-newly-released-papers-define-the-structure-of-key-protein-implicated-in
16. **Spratt, D.E.**, Mercier, P., Shaw, G.S. Structure of the HHARI catalytic domain shows glimpses of a HECT E3 ligase. (2013) *PLOS ONE* **8**, e74047.
15. **Spratt, D.E.**, Wu, K., Kovacev, J., Pan, Z.-Q., and Shaw, G.S. (2012) Selective recruitment of an E2~ubiquitin complex by an E3 ubiquitin ligase. *J. Biol. Chem.* **287**, 17374-17385.
14. **Spratt, D.E.**, and Shaw, G.S. (2011) Association of the disordered C-terminus of CDC34 with a catalytically-bound ubiquitin. *J. Mol. Biol.* **407**, 425-438.
13. Marlatt, N.M., **Spratt, D.E.**, and Shaw, G.S. (2010) Codon optimization for enhanced *Escherichia coli* expression of human S100A11 and S100A1 proteins. *Protein Expr. Purif.* **73**, 58-64.

Articles Published in Refereed Journals from Work Done @ University of Waterloo (Ph.D. Graduate Studies):

12. Piazza, M., Futrega, K., **Spratt, D.E.**, Dieckmann, T., and Guillemette, J.G. (2012) Structure and dynamics of calmodulin (CaM) bound to nitric oxide synthase peptides: effects of a phosphomimetic calmodulin mutation. *Biochemistry* **51**, 3651-3661.
11. **Spratt, D.E.**, Duangkham, Y., Taiakina, V., and Guillemette, J.G. (2011) Mapping the binding and calmodulin-dependent activation of nitric oxide synthase isozymes. *The Open Nitric Oxide Journal* **3**, 16-24.
10. Piazza, M., Duangkham, Y., **Spratt, D.E.**, Dieckmann, T., and Guillemette, J.G. (2011) Expression and purification of an isotopically labeled aggregation prone iNOS CaM binding protein for use in NMR studies. *J. Label. Compd. Radiopharm.* **54**, 657-663.
9. Feng, C., Dupont, A.L., Nahm, N.J., **Spratt, D.E.**, Weinberg, J.B., Guillemette, J.G., Salerno, J.C., Tollin, G., and Ghosh, D.K. (2009) Intraprotein electron transfer in inducible nitric oxide synthase holoenzyme. *J. Biol. Inorg. Chem.* **14**, 133-142.
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6. **Spratt, D.E.**, Taiakina, V., and Guillemette, J.G. (2007) Calcium-deficient calmodulin binding and activation of neuronal and inducible nitric oxide synthases. *Biochim. Biophys. Acta.* **1774**, 1351-1358.
5. **Spratt, D.E.**, Taiakina, V., Palmer, M., and Guillemette, J.G. (2007) Differential binding of calmodulin domains to constitutive and inducible nitric oxide synthase enzymes. *Biochemistry* **46**, 8288-8300.
4. **Spratt, D.E.**, Newman, E., Mosher, J., Ghosh, D.K., Salerno, J.C., and Guillemette, J.G. (2006) Binding and activation of nitric oxide synthase isozymes by calmodulin EF hand pairs. *FEBS J.* **273**, 1759-1771.
3. Lang, S., **Spratt, D.E.**, Guillemette, J.G., and Palmer, M. (2006) Selective labeling of selenomethionine residues in proteins with a fluorescent derivative of benzyl bromide. *Anal. Biochem.* **359**, 253-258.
2. Lang, S., **Spratt, D.E.**, Guillemette, J.G., and Palmer, M. (2005) Dual-targeted labeling of proteins using cysteine and selenomethionine residues. *Anal. Biochem.* **342**, 271-279.
1. Newman, E., **Spratt, D.E.**, Mosher, J., Cheyne, B., Montgomery, H.J., Wilson, D.L., Weinburg, J.B., Smith, S.M.E., Salerno, J.C., Ghosh, D.K., and Guillemette, J.G. (2004) Differential activation of nitric-oxide synthase isozymes by calmodulin-troponin C chimeras. *J. Biol. Chem.* **279**, 33547-33557.

ELECTRONIC MEDIA PUBLICATIONS

Electronic Publications from Work Done @ Clark University:

Three-dimensional Structure Coordinates:

14. ★Wang, Y., ⅄Bellesis, A.G., ⦿Royer, W.E., and ✪**Spratt, D.E.** Crystal structure of the C-terminal lobe of the human HERC6 HECT domain. (2018) *RCSB Protein Data Bank* (www.rcsb.org) Accession Code 5W87

Protein Assignments by NMR Spectroscopy:

13. ★Beasley, S.A., ⅄Kellum, C., and ✪**Spratt, D.E.** ^{1}H, ^{13}C, and ^{15}N resonance assignments the C-terminal lobe of the human HECT E3 ubiquitin ligase, E6AP. (2020) *Biological Magnetic Resonance Data Bank* (www.bmrb.wisc.edu) Acc. Code BMRB 50084
12. ★Beasley, S.A., ⅄Bardhi, R., and ✪**Spratt, D.E.** ^{1}H, ^{13}C, and ^{15}N resonance assignments the C-terminal lobe of the human HECT E3 ubiquitin ligase, ITCH. (2019) *Biological Magnetic Resonance Data Bank* (www.bmrb.wisc.edu) Acc. Code BMRB 27477

Electronic Publications from Work Done @ Western University (Postdoc/Research Associate):

Three-dimensional Structure Coordinates:

11. Kumar, A., Aguirre, J.D., Condos, T.E.C., Martinez-Torres, R.J., Chaugule, V.K., Toth, R., Sundaramoorthy, R. Mercier, P., Knebel, A., **Spratt, D.E.**, Barber, K.R., Shaw, G.S., and Walden, H. Crystal structures of human parkin UblR0RBR and S65DUblR0RBR (2015) *RCSB Protein Data Bank* (www.rcsb.org) Accession Codes 5C1Z and 5C23
10. **Spratt, D.E.**, Mercier, P., and Shaw, G.S. Solution structure of the catalytic domain of HHARI (2013) *RCSB Protein Data Bank* (www.rcsb.org) Accession Code 2M9Y
9. **Spratt, D.E.**, Mercier, P., Noh, Y.J., Mancyzk, N., and Shaw, G.S. NMR structures of the RING2 and IBR-RING2 domains from parkin (2013) *RCSB Protein Data Bank* (www.rcsb.org) Accession Codes 2LWR and 2M48
8. **Spratt, D.E.**, and Shaw, G.S. NMR structure of human cullin-free Rbx1 (2012) *RCSB Protein Data Bank* (www.rcsb.org) Accession Code 2LGV

Protein Assignments by NMR Spectroscopy:

7. **Spratt, D.E.**, Mercier, P., and Shaw, G.S. Backbone and sidechain ^{1}H, ^{13}C, and ^{15}N resonance assignments of the HHARI catalytic domain (2013) *Biological Magnetic Resonance Data Bank* (www.bmrb.wisc.edu) Accession Code BMRB 19315
6. **Spratt, D.E.**, Mercier, P., Noh, Y.J., Mancyzk, N., and Shaw, G.S. Backbone and sidechain ^{1}H, ^{13}C, and ^{15}N resonance assignments of RING2 and IBR-RING2 domains from parkin (2013) *Biological Magnetic Resonance Data Bank* (www.bmrb.wisc.edu) Accession Codes BMRB 18642 and 18990
5. **Spratt, D.E.**, and Shaw, G.S. Backbone and sidechain ^{1}H, ^{13}C, and ^{15}N resonance assignments of human cullin-free Rbx1 (2012) *Biological Magnetic Resonance Data Bank* (www.bmrb.wisc.edu) Accession Code BMRB 17824

Electronic Publications from Work Done @ University of Waterloo (Ph.D. Graduate Studies):

Three-dimensional Structure Coordinates:

4. Piazza, M., Futrega, K., **Spratt, D.E.**, Guillemette, J.G., and Dieckmann, T. Solution NMR structure of CaM bound to the iNOS CaM binding domain peptide (2012) *RCSB Protein Data Bank* (www.rcsb.org) Accession Code 2LL6
3. Piazza, M., Futrega, K., **Spratt, D.E.**, Guillemette, J.G., and Dieckmann, T. Solution NMR structure of CaM bound to the eNOS CaM binding domain peptide (2012) *RCSB Protein Data Bank* (www.rcsb.org) Accession Code 2LL7

Protein Assignments by NMR Spectroscopy:

2. Piazza, M., Futrega, K., **Spratt, D.E.**, Guillemette, J.G., and Dieckmann, T. Backbone and sidechain ^{1}H, ^{13}C, and ^{15}N resonance assignments of calmodulin bound to the iNOS CaM binding domain peptide (2012) *Biological Magnetic Resonance Data Bank* (www.bmrb.wisc.edu) Accession Codes BMRB 18027
1. Piazza, M., Futrega, K., **Spratt, D.E.**, Guillemette, J.G., and Dieckmann, T. Backbone and sidechain ^{1}H, ^{13}C, and ^{15}N resonance assignments of calmodulin bound to the eNOS CaM binding domain peptide (2012) *Biological Magnetic Resonance Data Bank* (www.bmrb.wisc.edu) Accession Codes BMRB 18028

RESEARCH HIGHLIGHTED ON THE WEB

Web Media Highlighting Work Done @ Clark University:

Commentary Highlighted online by *Diverse: Issues in Higher Education*

i) August 24th, 2020 "Five practical tips for a successful career in STEM" (https://diverseeducation.com/article/188408/)

Research Highlighted online in *Encyclopedia (MDPI)*

ii) June 18th, 2021 "HERC5 and the ISGylation Pathway" (https://encyclopedia.pub/12041)

iii) January 26th, 2021 "Ankyrin repeat-containing proteins" (https://encyclopedia.pub/7631)

Research Highlighted online and in print by *Research Outreach (UK)*

iv) July 8th, 2020 "How ubiquitin determines the fate of our proteins" (https://researchoutreach.org/articles/ubiquitin-determines-fate-proteins/)

Research Highlighted in Clark University *ResearchMatters Feature Articles*

v) June 21st, 2019 (https://clarknow.clarku.edu/2019/06/21/clark-graduates-launch-careers-in-massachusetts-the-countrys-no-1-job-market/)

vi) April 12th, 2019 (https://clarknow.clarku.edu/2019/04/12/in-the-lab-and-on-the-lake-emily-ladda-finds-her-stroke/)

vii) March 25th, 2019 (https://clarknow.clarku.edu/2019/03/25/grandfather-illness-inspires-her-academic-path-in-biochemistry-and-molecular-biology/)

viii) February 7th, 2019 (https://clarknow.clarku.edu/2019/02/07/in-clark-rylee-simons-has-found-a-college-for-all-seasons/)

ix) March 12th, 2018 (http://www.clarku.edu/articles/450000-nih-grant-funds-clark-protein-research)

x) January 20th, 2017 (https://www.clarku.edu/articles/spratt-lab-students-learn-science-is-not-race-its-journey)

xi) January 17th, 2017 (https://www.clarku.edu/articles/graduate-research-takes-aim-deadly-diseases)

xii) November 10th, 2016 (https://www.clarku.edu/articles/student-uses-power-math-and-chemistry-understand-biology)

xiii) August 24th, 2016 (https://www.clarku.edu/articles/students-bring-fresh-insights-scientific-research-gene-expression-deep-neural-networks)

Teaching and Outreach Highlighted on Clark University News *ClarkNOW* and other News Media

xiv) June 30th, 2021 (https://clarknow.clarku.edu/2021/06/30/2021-lund-awards-recognize-service-to-the-worcester-community/)

xiv) May 6th, 2021 (https://clarknow.clarku.edu/2021/05/06/clark-students-learn-whats-cooking-in-the-chemistry-lab/)

xv) March 26th, 2021 (https://clarknow.clarku.edu/2021/03/26/donald-spratt-sparks-interest-in-stem-careers-through-high-school-outreach/)

xvi) March 22nd, 2020 (https://clarknow.clarku.edu/2020/03/22/clark-professors-ready-to-welcome-students-to-their-online-classrooms/)

xvii) October 2nd, 2019 (https://clarknow.clarku.edu/2019/10/02/alumni-offer-clark-students-tips-on-finding-careers-that-promote-scientific-fearlessness/)

xviii) August 16th, 2019 (https://clarknow.clarku.edu/2019/08/16/prof-spratt-gives-high-school-biotechnology-students-a-college-lab-experience/)

xix) February 10th, 2019 (https://www.timescolonist.com/opinion/columnists/geoff-johnson-career-development-never-really-ends-1.23628708)

xx) January 18th, 2019 (https://www.facebook.com/ClarkUniversityWorcester/videos/2261721727179513)

xxi) January 17th, 2019 (https://clarknow.clarku.edu/2019/01/17/10-tips-for-landing-a-job-in-the-sciences)

NIH Grant, Spratt Lab research, and Carl J. and Anna Carlson Endowed Research Chair highlighted in the Spring 2018 Clark University Alumni Magazine, "Endowments That Change Lives", pg. 43; "Ubiquitin Study Funded" pg. 65. (https://issuu.com/clarkuniversity/docs/clark-magazine-winter-2018)

Research highlighted in the Spring 2017 LEEP Clark University Undergraduate Magazine, "Clark's Protein Posse" pg. 31 (https://issuu.com/clarkuniversity/docs/leep_mag_singles_web)

Research highlighted on the Clark University Main Webpage for Spring 2019 semester (Dec. 2018-April 2019, Jan.-April 2017)

Clark Campaign Videography for University Advancement – Members of the Spratt Lab and I were recorded doing biochemical research in our lab for a 4-minute video to aid in Clark University's advertising campaign for 2017-18. (http://www.clarku.edu/campaign-clark)

Clark Capital Campaign & Clark's Educational Mission – faculty profile was included in the Spring 2017 Clark University Marketing & Communications publication

Web Media Highlighting Work Done @ Western University (Postdoc/Research Associate):

Research highlighted on the cover of *EMBO J* – October 2015 (http://onlinelibrary.wiley.com/doi/10.1002/embj.v34.20/issuetoc)

Postdoctoral research highlighted on *Graduate Studies and Postdoctoral Affairs at Schulich School of Medicine & Dentistry Newsletter* – January 2014 (http://www.schulich.uwo.ca/gradstudies/about_us/monthly_newsletter/2014/january/profile_don_spratt.html)

Research highlighted in *Communications Newsletter of Schulich School of Medicine & Dentistry* – (https://www.schulich.uwo.ca/communications/feature-stories/articles/2013/10/29/from-bench-to-bedside-parkinson-s-researchers-make-breakthrough-discoveries)

Research highlighted on the *Michael J. Fox Foundation for Parkinson's Research* website – August 1st, 2013 (https://www.michaeljfox.org/foundation/news-detail.php?parkin-big-year-four-newly-released-papers-define-the-structure-of-key-protein-implicated-in)

PRESENTATIONS

Invited Presentations of Work Done @ Clark University:

23. Department of Chemistry – Bridgewater State University, Bridgewater MA, March 5th, 2021 (Virtual)
22. Department of Chemistry – Mount Alison University, Sackville NB, Canada, March 6th, 2020
21. Department of Chemistry – University of Waterloo, Waterloo ON, Canada, March 4th, 2020
20. Dean of the Faculty Seminar Series "On My Mind…Works In Progress" – Clark University, Worcester MA, February 27th, 2020
19. Departments of Physics and Chemistry – Rhode Island College, North Providence RI, November 8th, 2019
18. Maud Menten Memorial Lecturer, Depts. of Biochemistry and Chemistry – Western University, London ON, Canada, May 30th, 2019
17. Department of Biology – College of the Holy Cross, Worcester MA, February 19th, 2019
16. Department of Chemistry – University of Massachusetts Lowell, Lowell MA, October 4th, 2018
15. 32nd Protein Society Annual Symposium, Young Investigator Talk – Boston MA, July 11th, 2018
14. Department of Natural Sciences – Assumption College, Worcester MA, February 6th, 2018
13. Sherman Fairchild Summer Workshop Series – Clark University, Worcester MA, June 13th, '18, June 14th, '17 & June 15th, '16
12. Department of Chemistry – Bridgewater State University, Bridgewater MA, April 8th, 2016
11. Central MA ACS Meeting – Fitchburg State University, Fitchburg MA, March 23rd, 2016
10. Department of Biology – Clark University, Worcester MA, February 11th, 2016

Invited Presentations of Work Done @ Western University (Postdoc/Research Associate):

9. London Health Research Day, Academic Careers Panelist – Western University, London ON, Canada, April 1st, 2015
8. Department of Physiology and Pharmacology – Western University, London ON, Canada, February 23rd, 2015
7. Department of Chemistry and Biochemistry – Texas State University, San Marcos TX, December 5th, 2014
6. Gustaf H. Carlson School of Chemistry – Clark University, Worcester MA, November 24th, 2014
5. Departments of Chemistry and Biology – Syracuse University, Syracuse NY, January 9th, 2014
4. Department of Chemistry – Wilfrid Laurier University, Waterloo ON, Canada, June 10th, 2013
3. Institute of Biochemistry and Molecular Biology Seminar – University of Waterloo, Waterloo ON, Canada, March 20th, 2012
2. Biochemistry Forum, Department of Biochemistry – Western University, London ON, Canada, February 17th, 2012
1. Canadian Cancer Society Kitchener-Waterloo *Relay for Life* Event, Kitchener ON, Canada, June 18th, 2010

Conference Presentations of Work Done @ Clark University:

34. Kellum, C., Beasley, S.A., Orlomoski, R., Idrizi, F. and **Spratt, D.E.** An Angelman Syndrome substitution in the HECT E3 ubiquitin ligase C-terminal lobe of E6AP affects protein stability and activity. 34th Annual Meeting of the Worcester Regional Research Bureau, Worcester MA, Poster Presentation, October 10th, 2019.
33. Argiles Castillo, D., and **Spratt, D.E.** Biophysical and biochemical characterization of HACE1, a HECT E3 ubiquitin ligase implicated in cancer and Huntington's disease. 33rd Protein Society Annual Symposium, Seattle WA, Poster Presentation, June 30th-July 3rd, 2019. *Protein Society Graduate Travel Awardee.*
32. Bogle, A., Orlomoski, R., Dresch, J.M., Drewell, R.A., and **Spratt, D.E.** Biophysical and structural analysis of *Drosophila* transcription factors. 33rd Protein Society Annual Symposium, Seattle WA, Poster Presentation, June 30th-July 3rd, 2019. *Protein Society Graduate Travel Awardee.*
31. Bohl, J., and **Spratt, D.E.** Structural and biochemical analysis of the HECT E3 ubiquitin ligase HECW2. 33rd Protein Society Annual Symposium, Seattle WA, Oral and Poster Presentations, June 30th-July 3rd, 2019. *Protein Society Undergraduate Speaker and Travel Awardee.*
30. Ladda, E., and **Spratt, D.E.** Structural examination of the HECT E3 ligase AREL1 and its implications in apoptosis. 33rd Protein Society Annual Symposium, Seattle WA, Oral and Poster Presentations, June 30th-July 3rd, 2019. *Protein Society Undergraduate Speaker and Travel Awardee.*
29. Lee, Y.S., and **Spratt, D.E.** Biochemical and biophysical analysis of the function and structure of the HECT E3 ubiquitin ligase HERC4 C-terminus. 33rd Protein Society Annual Symposium, Seattle WA, Poster Presentation, June 30th-July 3rd, 2019. *Protein Society Undergraduate Travel Awardee.*
28. Loss, J., Dresch, J.M., Drewell, R.A., and **Spratt, D.E.** Biophysical and structural analysis of Antennapedia and Ultrabithorax homeodomain transcription factor-DNA binding affinities. 33rd Protein Society Annual Symposium, Seattle WA, Poster Presentation, June 30th-July 3rd, 2019. *Protein Society Graduate Travel Awardee.*
27. Mai, M., and **Spratt, D.E.** Biophysical examination of the E3 ubiquitin ligase, HECTD1: an important regulator in neurological development. 33rd Protein Society Annual Symposium, Seattle WA, Poster Presentation, June 30th-July 3rd, 2019. *Protein Society Graduate Travel Awardee.*
26. Rich, K., Schwaegerle, N., and **Spratt, D.E.** Structural and mechanistic characterization of HERC2 ubiquitin E3 ligase with implications in Cancer, Prader-Willi syndrome, and eye color. 33rd Protein Society Annual Symposium, Seattle WA, Poster Presentation, June 30th-July 3rd, 2019. *Protein Society Undergraduate Travel Awardee.*
25. Simons, R., Dresch, J.M., Drewell, R.A., and **Spratt, D.E.** Biophysical and structural analysis of Abdominal A and Abdominal B homeodomain transcription factors. 33rd Protein Society Annual Symposium, Seattle WA, Poster Presentation, June 30th-July 3rd, 2019. *Protein Society Undergraduate Travel Awardee.*
24. Kellum, C., Beasley, S.A., Orlomoski, R., Idrizi, F. and **Spratt, D.E.** An Angelman Syndrome substitution in the HECT E3 ubiquitin ligase C-terminal lobe of E6AP affects protein stability and activity. Gordon Research Conference – Proteins 2019, Holderness NH, Poster Presentation, June 17th, 2019.
23. Bogle, A., Drewell, R., Dresch, J., and **Spratt, D.E.** Biophysical and structural analysis of *Drosophila* transcription factors. Next-in-BIO 2018, Poster Presentation, Worcester MA, Poster Presentation, November 10th, 2018.
22. Wang, Y., Bellesis, A.G., Royer, W.E., and **Spratt, D.E.** The HECT C-terminal lobe of HERC6 reveals a unique autoinhibitory domain swapping mechanism. Young Investigator Talk, 32nd Protein Society Annual Symposium, Boston MA, Oral Presentation, July 9th-12th, 2018.
21. Ogisu, E., and **Spratt, D.E.** Biochemical and biophysical examination of the human HECT E3 ubiquitin ligase WWP1. 32nd Protein Society Annual Symposium, Boston MA, Poster Presentation, July 9th-12th, 2018.
20. Prosterman, L. and **Spratt, D.E.** Structural and functional studies of the HECT E3 ubiquitin ligase AREL1. 32nd Protein Society Annual Symposium, Boston MA, Poster Presentation, July 9th-12th, 2018.
19. Schwaegerle, N.D., and **Spratt, D.E.** Uncovering the catalytic mechanism of the C-terminal tail of the large HECT E3 ubiquitin ligase HERC2. 32nd Protein Society Annual Symposium, Boston MA, Poster Presentation, July 9th-12th, 2018.
18. Wang, Y., Bellesis, A.G., Royer, W.E., and **Spratt, D.E.** The HECT C-terminal lobe of HERC6 reveals a unique autoinhibitory domain swapping mechanism. The Ubiquitin System: Function, Physiology and its Role in Disease Conference, Nassau, Bahamas, Poster Presentation, June 3rd-6th, 2018.
17. Ivancic, V., Krasinski, C.A., **Spratt, D.E.**, and Lazo, N.D. Steady-state kinetics of the degradation of insulin by insulin-degrading enzyme using circular dichroism spectroscopy. 31st Protein Society Annual Symposium, Montreal PQ, Canada, Poster Presentation, July 24-27th, 2017.
16. Ogisu, E., and **Spratt, D.E.** Biochemistry and Mechanism of the HECT E3 Ubiquitin Ligase WWP1. Brandeis University Undergraduate Science Symposium & Workshop, Waltham MA, Poster Presentation, Sept. 17th, 2016.

15. Htun, P., and **Spratt, D.E.** Biochemical and Mechanistic Study of the HECT E3 Ubiquitin Ligase AREL1. Brandeis University Undergraduate Science Symposium & Workshop, Waltham MA, Poster Presentation, Sept. 17th, 2016.
14. Gardner, J.A., and **Spratt, D.E.** Biochemistry and Mechanism of HACE1. Brandeis University Undergraduate Science Symposium & Workshop, Waltham MA, Poster Presentation, Sept. 17th, 2016.

Conference Presentations of Work Done @ Western University (Postdoc/Research Associate):

13. **Spratt, D.E.**, Marlatt, N.M., Macklin, J.A., and Shaw, G.S. *In vitro* analysis of human S100 protein heterodimer complex formation. 19th International Symposium on Calcium Binding Proteins and Calcium Function in Health and Disease, Nashville TN, USA, Poster Presentation, May 30th–June 3rd, 2015.
12. Aguirre, J.D., Kumar, A., Condos, T.E.C., Mercier, P., Martinez-Torres, J., Barber, K.R., **Spratt, D.E.**, Walden, H, and Shaw, G.S. Disruption of an autoinhibited state primes the E3 ligase parkin for activation and catalysis. 2015 EMBO Ubiquitin Meeting, Cavtat, Croatia, Poster Presentation, September 18th-22nd, 2015.
11. Aguirre, J.D., George, S., **Spratt, D.E.**, O'Donoghue, P., and Shaw, G.S. Recoding the *E. coli* genome for production of recombinant phosphoproteins. London Health Research Day, London ON, Canada, Poster presentation, April 1st, 2015.
10. **Spratt, D.E.**, and Shaw, G.S. Deciphering the Mechanism of E2 and E3 enzymes in Ubiquitylation. MOOT XXVI NMR Conference, Kingston ON, Canada, Oral presentation. October 26-27th, 2013.
9. **Spratt, D.E.**, Martinez-Torres, R.J., Noh, Y.J., Mercier, P., Manczyk, N., Barber, K.R., Aguirre, J.D., Burchell, L., Purkiss, A., Walden, H., and Shaw, G.S. A molecular explanation for the recessive nature of *parkin*-linked Parkinson's disease. 2013 CSHL Meeting on "The Ubiquitin Family", Cold Spring Harbor NY, USA, Poster presentation. May 14-18th, 2013.
8. **Spratt, D.E.**, Mercier, P., Manczyk, N., and Shaw, G.S. The unique structure of a RING domain from parkin provides insight into the development of autosomal recessive Parkinson disease. 25th International Conference on Magnetic Resonance in Biological Systems, Lyon Rhône, France, Poster Presentation. August 19-24th, 2012.
7. **Spratt, D.E.**, and Shaw, G.S. Probing the autoinhibition of a cullin-RING E3 ubiquitin ligase by NMR spectroscopy. 25th International Conference on Magnetic Resonance in Biological Systems, Lyon Rhône, France, Poster Presentation. August 19-24th, 2012.
6. **Spratt, D.E.**, Cook, B.W., Barber, K.R. and Shaw, G.S. Protein interactions of ubiquitin within E2 and E3 enzyme complexes. 94th Canadian Chemistry Conference and Exhibition, Montreal PQ, Canada, Oral Presentation. June 5-9th, 2011.
5. **Spratt, D.E.** and Shaw G.S. Rbx1 preferentially binds to the CDC34~ubiquitin complex during SCF-dependent polyubiquitin chain assembly. 2011 CSHL Meeting on "The Ubiquitin Family", Cold Spring Harbor NY, USA, Poster presentation. May 17th-21st, 2011.
4. **Spratt, D.E.** and Shaw G.S. The structure of Rbx1/ROC1 and its site of interaction with CDC34 provide insights into SCF-dependent polyubiquitin chain assembly. 24th International Conference on Magnetic Resonance in Biological Systems, Cairns QLD, Australia, Poster presentation. August 22nd-27th, 2010.
3. **Spratt, D.E.**, Rintala-Dempsey, A.C., Barber, K.R., and Shaw, G.S. Interactions within the E2 enzyme CDC34-ubiquitin complex are transient. Biophysical Society 54th Annual Meeting, San Francisco CA, USA, Poster presentation. February 20-24th, 2010.

Conference Presentations of Work Done @ University of Waterloo (Ph.D. Graduate Studies; 2 of 10**):**

2. Guillemette, J.G., **Spratt, D.E.**, Montgomery, H.J., Newman, E., Perdicakis, B., and Jervis E.J. Control of nitric oxide synthase activity by calmodulin and a caged inhibitor. 90th Canadian Chemistry Conference and Exhibition, Winnipeg MB, Canada, Oral presentation. May 26-30th, 2007.
1. **Spratt, D.E.**, Taiakina, V., and Guillemette, J.G. FRET analysis of calmodulin binding to nitric oxide synthase peptides and enzymes. Experimental Biology – ASBMB Annual Meeting, Washington DC, USA, Poster presentation. April 28th-May 2nd, 2007.

Published Abstracts/Number of Notes of Work Done @ University of Waterloo (Ph.D. Graduate Studies):

5. **Spratt, D.E.**, Taiakina, V., and Guillemette, J.G. (2008) Dynamic conformation changes of calmodulin when bound to nitric oxide synthase using FRET. *FASEB J.* **22**, 1009.1.
4. Israel, O.K., **Spratt, D.E.**, Taiakina, V., and Guillemette, J.G. (2008) The binding and activation of nitric oxide synthase by modified central linker and "phosphomimetic" calmodulin proteins. *FASEB J.* **22**, 612.1.
3. **Spratt, D.E.**, Taiakina, V., and Guillemette, J.G. (2007) FRET analysis of calmodulin binding to nitric oxide synthase peptides and enzymes. *FASEB J.* **21 (5)**, A645.
2. Newman, E., **Spratt, D.E.**, Mosher, J., Cheyne, B., Montgomery, H.J., Wilson, D.L., Weinberg, J.B., Smith, S.M.E., Salerno, J.C., Ghosh, D.K., and Guillemette, J.G. (2004) Differential activation of the three nitric oxide synthase isozymes by calmodulin-troponin C chimeras. *FASEB J.* **18 (8)**, C20.
1. Salerno, J.C., Newman, E., **Spratt, D.E.**, Mosher, J., Cheyne, B., Montgomery, H.J., Wilson, D.L., Weinberg, J.B., Smith, S.M.E., Ghosh, D.K., and Guillemette, J.G. (2004) Differential activation of the three nitric oxide synthase isozymes by calmodulin-troponin C chimeras. *Nitric Oxide-Biology and Chemistry* **11 (1)**, 69-70.

Graduate Research Presentations @ Clark University (Ph.D. and Accelerated M.S.)

Graduate Multidisciplinary Conference (April 17th, 2019)

Argiles-Castillo, D. and **Spratt, D.E.** Biophysical and biochemical characterization of HACE1, a HECT E3 Ligase implicated in cancer and Huntington's Disease. (Poster Presentation)

Beasley, S. and **Spratt, D.E.** The G2E3 HECT domain possesses E3 ligase activity (Oral Presentation)

Bogle, A., Drewell, R., Dresch, J., and **Spratt, D.E.** Biophysical and structural analysis of *Drosophila* transcription factors (Poster Presentation)

Loss, J., Drewell, R., Dresch, J., and **Spratt, D.E.** Learning to fly: Understanding homeodomain transcription factor-DNA binding affinity in *D. melanogaster* (Poster Presentation)

Mai, M., and **Spratt, D.E.** Science on the Brain: The Biochemical Characterization of Ubiquitin E3 Ligase, HECTD1 (Poster Presentation)

Neves, R. and **Spratt, D.E.** Dimerization of HECT C-terminal lobe of HECR6 in and auto-inhibitory mechanism (Oral Presentation)

Fall Academic Spree Day (October 26th, 2018)

Argiles-Castillo, D., and **Spratt, D.E.** Structural and biochemical characterization of HACE1: a HECT E3 ubiquitin ligase involved in Huntington's Disease and Wilms' Tumor

Bogle, A., Drewell, R., Dresch, J., and **Spratt, D.E.** Biophysical and structural analysis of *Drosophila* transcription factors.

Loss, J., Drewell, R., Dresch, J., and **Spratt, D.E.** Biophysical analysis of Antp and Ubx homeodomain transcription factor-DNA binding affinity.

Mai, M., and **Spratt, D.E.** Biophysical studies of ubiquitin E3 ligase, HECTD1, and its disease relevance.

Bumpus Biology Graduate Research Symposium (August 29th, 2018)

Bogle, A., Drewell, R., Dresch, J., and **Spratt, D.E.** Biophysical and structural analysis of *Drosophila* transcription factors (Oral Presentation)

Loss, J., Drewell, R., Dresch, J., and **Spratt, D.E.** Biophysical analysis of homeodomain transcription factors. (Poster presentation)

Graduate Multidisciplinary Conference (April 18th, 2018)

Ogisu, E. and **Spratt, D.E.** Biochemical studies of the HECT E3 ubiquitin ligase WWP1 and its involvement in Ebola, breast, and prostate cancer. (Poster Presentation)

Orlomoski, R., Drewell, R., and **Spratt, D.E.** Biophysical analysis of homeodomain transcription factor-DNA binding site affinity. (Poster presentation)

Prosterman, L. and **Spratt, D.E.** Structural and biochemical studies of the HECT E3 ligase AREL1**.** (Poster presentation)

Schwaegerle, N. and **Spratt, D.E.** Uncovering the mechanism of the HERC2 C-lobe extension: an ubiquitin ligase implicated in breast cancer tumorigenesis. (Poster presentation)

Fall Academic Spree Day (October 27th, 2017)

Ogisu, E. and **Spratt, D.E.** Biochemical studies of the HECT E3 ubiquitin ligase WWP1 and its involvement in ebola, breast and prostate cancer. (Poster presentation)

Prosterman, L., Htun, P., and **Spratt, D.E.** Biochemical studies to better understand how the HECT E3 ligase AREL1 forms lysine33 ubiquitin chains. (Poster presentation)

Schwaegerle, N. and **Spratt, D.E.** Uncovering the mechanism of the HERC2 C-lobe extension: an ubiquitin ligase implicated in breast cancer tumorigenesis. (Poster presentation)

Bumpus Biology Graduate Research Symposium (August 30th, 2017)

Ogisu, E. and **Spratt, D.E.** HECT E3 ubiquitin ligase WWP1: a major player in cellular signaling pathways and diseases. (Poster Presentation)

Orlomoski, R., Drewell, R., Dresch, J., and **Spratt, D.E.** Biophysical analysis of FTZ-DNA binding site affinity. (Poster presentation)

Prosterman, L. and **Spratt, D.E.** The classification and characterization of the HECT E3 ligases SMURF1 and AREL1**.** (Poster presentation)

Schwaegerle, N. and **Spratt, D.E.** Uncovering the mechanism of the HERC2 C-lobe extension: an ubiquitin ligase implicated in breast cancer tumorigenesis. (Oral presentation)

Undergraduate Research Poster Presentations @ Clark University (Honors, Directed Study, and/or LEEP Fellows)

Academic Spree Day (May 19th, 2021)

Advocate, M. and **Spratt, D.E.** Biochemical and structural analysis of ultrabithorax as an important developmental protein in *Drosophila melanogaster*.

Amador, G. and **Spratt, D.E.** Biophysical analysis of homeodomain transcription factors.

Bosia, E., Bohl, J. and **Spratt, D.E.** How to optimize your protein: expression and purification of HECW2 domains.

Levin, R.H. and **Spratt, D.E.** Optimizing the purification of the HECT E3 ubiquitin ligase UBE3D C-lobe.

Mathieu, N.A. and **Spratt, D.E.** HERC5 and ISG15: critical modulators of the innate immune response.

Schafer, A., Lee, Y-S. and **Spratt, D.E.** A study on the extended HECT domain of HERC4 and its relation to male fertility.

Shrestha, S. and **Spratt, D.E.** Overexpression of UBR5 as a precursor to cancer – a biochemical and structural analysis.

Vincent, T. and **Spratt, D.E.** Characterization of TF-DNA interactions in *Drosophila*.

White, V. and **Spratt, D.E.** Biochemical examination of HECTW1, an enzyme implicated in progeria and cancer development.

Academic Spree Day (April 24th, 2019)

Bohl, J. and **Spratt, D.E.** Structural and biochemical analysis of the HECT E3 ubiquitin ligase HECW2 and its implications in progeria.

Kellum, C. and **Spratt, D.E.** Dysfunctional HECT E3 ligase E6AP is linked to the neurodevelopmental disorder Angelman's syndrome.

Ladda, E. and **Spratt, D.E.** Structural examination of the HECT E3 ubiquitin ligase AREL1 and its implications in apoptosis.

Lee, Y-S. and **Spratt, D.E.** Biochemical and structural examination of HERC4 – a HECT E3 ubiquitin ligase that controls spermatogenesis and cancer metastasis

Munroe, S. and **Spratt, D.E.** Biophysical analysis of Eve, Bicoid, and Caudal homeodomain transcription factors-DNA binding affinity.

Rich, K., Schwaegerle, N., and **Spratt, D.E.** Structure and mechanism of HERC2 with implications in cancer, Prader-Willi syndrome, and eye color.

Simons, R. and **Spratt, D.E.** Biophysical analysis of AbdA and AbdB homeodomain transcription factors.

Fall Academic Spree Day (October 26th, 2018)

Bohl, J. and **Spratt, D.E.** Structural and biochemical analysis of the HECT E3 ubiquitin ligase, HECW2, and its implications in progeria.

Kellum, C. and **Spratt, D.E.** Structural and functional studies of the HECT E3 ubiquitin ligase E6AP reveal a possible mechanism for the neurodevelopmental disorder Angelman Syndrome.

Ladda, E. and **Spratt, D.E.** Biochemical and biophysical characterization of HECT E3 ubiquitin ligase AREL1 and its implications in apoptosis.

Lee, Y-S. and **Spratt, D.E.** Biochemical and structural examination of HERC4 – a HECT E3 ubiquitin ligase that controls spermatogenesis, cancer metastasis, and organ size.

Rich, K., Schwaegerle, N, and **Spratt, D.E.** A tale of a tail: structural and functional studies of HERC2 C-lobe with implications of breast cancer.

Simons, R., Drewell, R., Dresch, J., and **Spratt, D.E.** Biophysical analysis of AbdA and AbdB homeodomain transcription factor-DNA binding affinity.

Academic Spree Day (April 25th, 2018)

Argiles-Castillo, D. and **Spratt, D.E.** Biochemical and structural studies of HACE1, a HECT E3 ubiquitin ligase linked to Huntington's Disease and Wilms' tumor.

Bogle, A. Drewell, R., Dresch, J., and **Spratt, D.E.** Biophysical determination of KRUPPEL binding affinity.

Loss, J. and **Spratt, D.E.** Expression, purification, and activity of pFU DNA polymerase.

Maguire, C., **Spratt, D.E.**, and Zitzewitz, J. Investigating folding intermediates in ALS linked RNA binding proteins.

Mai, M. and **Spratt, D.E.** Biochemically characterizing HECTD1 and investigating its functional implications.

Majka, J., **Spratt, D.E.**, and McManus, D. Fat and gene expression: relationships in a heart rhythm disorder.

Ziemba, E. and **Spratt, D.E.** Cancer drug binding studies with Cullin-1 WHB domain.

Fall Academic Spree Day (October 27th, 2017)

Argiles-Castillo, D. and **Spratt, D.E.** Biochemical studies of HACE1, an E3 ubiquitin ligase linked to Huntington's Disease and Wilm's tumors.

Bogle, A. Drewell, R., Dresch, J., and **Spratt, D.E.** Determinations of the binding strength of Krupple for specific CRMs.

Kellum, C., and **Spratt, D.E.** An Angelman Syndrome substitution in the HECT E3 ubiquitin ligase C-terminal lobe of E6AP affects protein stability and activity.

Sun, Y-S. and **Spratt, D.E.** Biochemistry of HERC4, an E3 ubiquitin ligase involved in cancer metastasis and spermatogenesis.

Meservier, R., Ivancic, V.A., **Spratt, D.E.**, and Lazo, N.D. IDE-dependent degradation of insulin in the presence of ATP.

Academic Spree Day (April 26th, 2017)

Alzuhairy, N. and **Spratt, D.E.** Biochemistry and mechanism of the HECT E3 ubiquitin ligase HUWE1.

Bardhi, R. and **Spratt, D.E.** Biochemical characterization of HECT E3 ubiquitin ligase Itch and its implications in cancer.

Brown, A. and **Spratt, D.E.** Biochemical characterization of TRIP12, a HECT E3 ubiquitin ligase linked to Autism Spectrum Disorder

Gardner, J. and **Spratt, D.E.** Biochemistry and mechanism of HACE1.

Htun, P. and **Spratt D.E.** Characterization of AREL1 to understand apoptosis resistance in cancer cells.
Kiveliyk, V. and **Spratt, D.E.** Characterization of the HECT E3 ubiquitin ligase HECTD1.
Ogisu, E. and **Spratt, D.E.** HECT E3 ubiquitin ligase WWP1: a major player in cellular signaling pathways and diseases.
Orlomoski, R., Drewell, R., Dresch, J., and **Spratt, D.E.** Biophysical analysis of FTZ-DNA binding site affinity.
Prosterman, L. and **Spratt, D.E.** Studies to better understand the structure and mechanism of SMURF1, a HECT E3 ubiquitin ligase**.**
Schwaegerle, N. and **Spratt, D.E.** Biochemical characterization of HERC2, a HECT E3 ligase implicated in breast cancer and PWS.
Torres, A. and **Spratt, D.E.** HECTD3 E3: a ubiquitin ligase associated with breast cancer.

Fall Academic Spree Day (October 21st, 2016)

Alzuhairy, N. and **Spratt, D.E.** Biochemical and mechanistic studies on the HECT E3 ubiquitin ligase HUWE1.
Bardhi, R. and **Spratt, D.E.** Biochemical and mechanistic studies of ITCH: a HECT E3 ubiquitin ligase.
Gardner, J. and **Spratt, D.E.** Biochemistry and mechanism of HACE1.
Htun, P. and **Spratt D.E.** Deciphering the structure and mechanism of AREL1 to enhance chemosensitivity in tumor cells.
Idrizi, F. and **Spratt, D.E.** A mechanistic and biochemical study of HERC1 and E6AP E3 ubiquitin ligases.
Kiveliyk, V. and **Spratt, D.E.** HECTD1 - an E3 ubiquitin ligase involved in neural tube closure and placental development.
Ogisu, E. and **Spratt, D.E.** Biochemistry and mechanism of the HECT E3 ubiquitin ligase WWP1.
Orlomoski, R., Drewell, R., Dresch, J., and **Spratt, D.E.** Biophysical analysis of FTZ-DNA binding site affinity.
Prosterman, L. and **Spratt, D.E.** Biochemical characterization of SMURF1.
Schwaegerle, N. and **Spratt, D.E.** Biochemical characterization of HERC2, a HECT E3 ubiquitin ligase implicated in breast cancer.

FUNDING SUPPORT

Funded External Grant Applications @ Clark University

2017 – 2020 "Structure and Mechanism of HECT E3 Ubiquitin Ligases" R15GM126432
NIH R15 AREA (PA-16-200), National Institute of General Medical Sciences (NIGMS)
Role: PI, Status: Funded, Total Funds: $450,900 (3 years)

2020 "Clark University Biochemistry Outreach in Worcester MA: Protein Purification and Science Careers"
The Protein Society Mini Grant, The Protein Society
Role: PI, Status: Funded, Total Funds Requested: $500 (1 year)

Research Funding Support @ Clark University (August 2015 – present)

2021 – 2022 "Biochemical and Structural Examination of Proteins Implicated in Human Diseases"
Faculty Research Development Fund, Clark University (Competitive, Internal)
Role: PI, Status: Funded, Total Funds: $5,000 (1 year)
This faculty development research award from the Research Board at Clark University allowed for the purchase of consumables to support the Spratt Lab's ongoing examination of protein structure and function.

2020 – 2021 "Investigating TF-DNA interactions through cross-disciplinary approaches"
Faculty Research Development Fund, Clark University (Competitive, Internal)
Role: Co-applicant, Status: Funded, Total Funds: $7,500 (1 year)
This faculty development research award from the Research Board at Clark University allowed for the purchase of consumables to support the Drewell (Biology), Dresch (Math & Computer Science), and Spratt Lab's ongoing multidisciplinary examination of protein-DNA interactions.

2019 – 2020 "Biophysical Measurements of Protein-Protein/DNA Interactions Involved in Human Brain Biochemistry"
Ann and Leo Beavers II Endowed Fellowship Fund, Dean of Research, Clark University (Competitive, Internal)
Role: PI, Status: Funded, Total Funds: $45,000 (1 year)
The funding from this grants program, which supports projects involving "research in biochemistry, molecular biology, neurology or genetics that has an aspect and contributes to progress in understanding of mental health or mental retardation", and the Dean of Research at Clark University was used contribute towards the purchase of a shared Affinity Isothermal Titration Calorimeter from TA Instruments to biophysically measure protein-protein/DNA/RNA/small molecule interactions in support of the ongoing research program in the Spratt Lab as well as BCMB, Chemistry and Biology faculty at Clark University.

Spring 2020 Grant Incentive Faculty Award, Clark University (Competitive, Internal)
Role: PI, Status: Funded, Total Funds: $13,500 (1 semester)
This faculty research award from the Provost Management Group at Clark University allowed for a one course teaching release in Spring 2020 to free up time to write proposals to federal granting agencies.

2018 – 2019 "Visualizing Proteins Involved in Human Brain Biochemistry"
Ann and Leo Beavers II Endowed Fellowship Fund, Clark University (Competitive, Internal)
Role: PI, Status: Funded, Total Funds: $28,000 (1 year)
The funding from this grants program, which supports projects involving "research in biochemistry, molecular biology, neurology or genetics that has an aspect and contributes to progress in understanding of mental health or mental retardation", was used to purchase an iBright FL1000 imager with UV, Vis, Chemiluminescence, Fluorescence and Infrared capabilities to visualize agarose, SDS-PAGE, and Western blots in support of the ongoing research program in the Spratt Lab as well as the BCMB, Chemistry and Biology programs at Clark University.

2018 – 2019 "Decoding Gene Regulatory Networks Using Integrative Systems-Level Approaches"
Faculty Research Development Fund, Clark University (Competitive, Internal)
Role: Co-applicant, Status: Funded, Total Funds: $5,000 (1 year)
This faculty development research award from the Research Board at Clark University allowed for the purchase of consumables to support the Drewell (Biology), Dresch (Math & Computer Science), and Spratt Lab's ongoing multidisciplinary examination of protein-DNA interactions.

2017 – 2018 "Deciphering the Biochemical Basis for E6AP and HERC2 Enzyme Dysfunction in Human Intellectual Disability"
Ann and Leo Beavers II Endowed Fellowship Fund, Clark University (Competitive, Internal)
Role: PI, Status: Funded, Total Funds: $8,500 (1 year)
The funding from this grants program, which supports projects involving "research in biochemistry, molecular biology, neurology or genetics that has an aspect and contributes to progress in understanding of mental health or mental retardation", was used to purchase a NanoDrop One^{C} Microvolume UV-Vis spectrophotometer for the routine quantification of protein, DNA and RNA samples in support of the ongoing research program in the Spratt Lab and the BCMB program at Clark University.

2017 – 2018 "Protein Structure Determination of Enzymes Related to Human Diseases"
Faculty Research Development Fund, Clark University (Competitive, Internal)
Role: PI, Status: Funded, Total Funds: $5,000 (1 year)
This faculty development research award from the Research Board at Clark University allowed for the purchase of consumables to support the Spratt Lab's ongoing X-ray crystallography protein structure experiments using the X-ray Core Facility at the University of Massachusetts Medical School (Worcester, Massachusetts, USA).

2015 – 2018 "Biochemistry & Mechanism of HECT E3 Ubiquitin Ligases"
New Faculty Start-up Funds, Clark University
Role: PI, Status: Funded, Total Funds: $190,000 (3 years)
This three-year start-up research allowance from the Carlson School of Chemistry & Biochemistry at Clark University allows for the purchase of equipment and the training of Clark University graduate and undergraduate students examining HECT E3 ubiquitin ligases.

2015 – 2018 "Biochemistry & Mechanism of HECT E3 Ubiquitin Ligases"
Carl J. and Anna Carlson Endowed Research Chair, Clark University
Role: PI, Status: Funded, Total Funds: $60,000 (3 years)
This three-year endowed research allowance from the Carlson School of Chemistry & Biochemistry supports the on-going studies in Spratt Lab at Clark and allows for the purchase of equipment and training of graduate and undergraduate students examining HECT E3 ubiquitin ligases.

Teaching Funding Support @ Clark University (August 2015 – present)

2020 -- 2021 Career to Curriculum Faculty Fellow, Clark University (Competitive, Internal)
Role: PI, Status: Funded, Total Funds: $5,000 (1 year)
This professional development internal grant program from Clark University funded by the Arthur Vining Davis C2C Fellows program is to build and enhance career preparation in and across the undergraduate curriculum at Clark. This program involves regular meetings with other faculty and staff from different disciplines across campus to discuss approaches to help Clark students become better prepared for a successful career after graduating from Clark.

2020 Dean's Public Intellectuals Program, Clark University (Competitive, Internal)
Role: PI, Status: Funded, Total Funds: $2,000 (1 year)
This professional development internal grant program from the Dean of the Faculty is intended to train faculty on how to become ambassadors for the Clark University that can effectively communicate to the general population about their ongoing research projects. This program involves regular meetings with other faculty from different disciplines across campus to discuss approaches to reach a general audience in effective ways.

Spring 2019 Capstone Course Development Grant, Clark University (Competitive, Internal)
Role: PI, Status: Funded, Total Funds: $1,000 (1 year)
The funding from this internal grant program from the Dean of the College supports the development of a capstone course for BCMB majors. This program involves regular meetings with other faculty from different disciplines across campus to discuss the design and implementation of courses to fulfill the capstone requirement for all undergraduate students at Clark University.

Summer Student Research Funding Support @ Clark University (May 2016 – present)

Summer 2021 AbbVie Summer Student Research Award ($27,000)
Summer student stipend support and funds to purchase consumables for three BCMB undergraduate students working in the Spratt Lab
Edwin A. Weiller Summer Student Award ($7,000)
Summer student stipend support for two BCMB undergraduate students working in the Spratt Lab

Beavers Endowed Summer Student Award ($4,000)
Summer student stipend support for a BCMB undergraduate student working in the Spratt Lab
Milburn Endowed Summer Student Award ($4,000)
Summer student stipend support for a BCMB undergraduate student working in the Spratt Lab

Summer 2020 AbbVie Summer Student Research Award ($9,000)
Summer student stipend support and funds to purchase consumables for a BCMB undergraduate student working in the Spratt Lab
Milburn Endowed Summer Student Award ($4,000)
Summer student stipend support for a CHEM undergraduate student working in the Spratt Lab
Martell and Sugihara Endowed Summer Student Award ($4,000)
Summer student stipend support for a CHEM undergraduate student working in the Spratt Lab

Summer 2019 AbbVie Summer Student Research Award ($9,064)
Summer student stipend support and funds to purchase consumables for a BCMB undergraduate student working in the Spratt Lab
Massachusetts Life Sciences Center High School Student Internship Award ($2,880)
Stipend support for a Worcester Technical High School student working in the Spratt Lab

Summer 2018 Clark University Science Summer Scholars Program ($10,500)
Summer student stipend support for three BCMB undergraduate students working in the Spratt Lab
Milburn Endowed Summer Student Award ($9,000)
Summer student stipend support for three BCMB undergraduate students working in the Spratt Lab
AbbVie Summer Student Research Award ($8,926)
Summer student stipend support and funds to purchase consumables for a BCMB undergraduate student working in the Spratt Lab

Summer 2017 Clark University Science Summer Scholars Program ($7,000)
Summer student stipend support for two BCMB undergraduate students working in the Spratt Lab
James & Ada Bickman Endowed Summer Student Award ($3,000)
Summer student stipend support for a BCMB undergraduate student working in the Spratt Lab
LEEP Summer Scholars Award ($8,500)
Summer student stipend support for four BCMB undergraduate students working in the Spratt Lab

Summer 2016 Clark University Science Summer Scholars Program ($10,500)
Summer student stipend support for three BCMB undergraduate students working in the Spratt Lab
James & Ada Bickman Endowed Summer Student Award ($3,000)
Summer student stipend support for a BCMB undergraduate student working in the Spratt Lab
LEEP Summer Scholars Award ($7,500)
Summer student stipend support for three BCMB undergraduate students working in the Spratt Lab

Funding Support as a Postdoctoral Researcher @ Western University

2012 Canadian Institutes of Health Research (CIHR) Postdoctoral Fellowship, Gov. of Canada
Role: PI, Status: Funded, Total Funds: $45,000 (1 year)

2010 – 2011 Natural Sciences & Engineering Research Council of Canada (NSERC) Postdoctoral Fellowship, Gov. of Canada
Role: PI, Status: Funded, Total Funds: $80,000 (2 years)

2008 – 2010 Ontario Ministry of Research and Innovation (OMRI) Postdoctoral Fellowship, Gov. of Ontario & Western University
Role: PI, Status: Funded, Total Funds: $100,000 (2 years)

PROFESSIONAL SERVICE, ADMINSTRATIVE & LEADERSHIP

Professional Service (External) @ Clark University

Spring 2021 Abstract Reviewer
35th Protein Society Annual Symposium - Virtual

Spring 2021 – Reviewer Board – *International Journal of Molecular Sciences* (2-year term)

Spring 2021 Grant Panel Reviewer – National Institutes of Health (NIH)
NIGMS – Pathway to Independence Award (K99/R00), Virtual Conference

Spring 2020 – Mentor - National Research Mentoring Network (NRMN)

Spring 2020 External Grant Reviewer – Medical Research Council (MRC), UK
Molecular and Cellular Medicine Board

July 2019 – Protein Society Membership Committee

July 1st, 2019 Session Chair – "Folding, Function & Quality Control of Membrane Proteins"
Co-organizer and Facilitator – Educational Workshop "Building Active Learning into Your Teaching"
Panelist – "Teaching and Research in Primarily Undergrad Institutions"
33rd Protein Society Annual Symposium – Seattle WA

June 17th, 2019 Discussion Leader – "Folding"
Panelist – "Setting Up and Managing Your First Lab"
Gordon Research Conference – Proteins 2019, Holderness NH

May 29th, 2019 External Ph.D. Examiner – Nileeka Balasuriya
Department of Biochemistry, Western University, London ON, Canada

Spring 2019 Grant Panel Reviewer – National Science Foundation (NSF)
Chemistry of Life Processes – Protein Structure and Dynamics, Virtual Conference

January 2019 – Protein Society Educational Committee – Undergraduate & Graduate Abstract Reviewer

Oct. 17th, 2018 Panelist – "Professionalism and Research Conduct" Career Pathways Community
Graduate School of Medical Sciences, University of Massachusetts Medical School, Worcester MA

July 9th, 2018 Panelist – "Teaching and Research in Primarily Undergrad Institutions"
Protein Society Undergraduate Poster Judge
32nd Protein Society Annual Symposium - Boston MA

Spring 2018 Grant Panel Reviewer – National Institutes of Health (NIH)
Macromolecular Structure and Function B Study Section (MSFB), San Francisco CA

Dec. 13th, 2017 Panelist – "Research in Academia and Government" Career Pathways Community
Graduate School of Medical Sciences, University of Massachusetts Medical School, Worcester MA

Fall 2016 – Scientific Manuscript Reviewer
Biochimica et Biophysica Acta – General Subjects, Biochemical Journal, *Biochemical Society Transactions, Biology, Biomolecules, Biophysical Journal*, *Bioscience Reports, Cell Biology & Toxicology, Cells, BMC Bioinformatics, Emerging Topics in Life Sciences, Foods, Frontiers in Genetics, Frontiers in Oncology, International Journal of Molecular Sciences, Journal of Cancer, Molecules, Protein Expression and Purification, Scientific Reports*, *Springer Nature, Trends in Biochemical Sciences, McGill Science Undergraduate Research Journal*

University-Wide Service @ Clark University

Fall 2021 – Clark University Admissions & Financial Aid Committee, Natural Sciences Representative (3-year term)

Spring 2021 Clark LEEP Fellow Application Reviewer, STEM Faculty Representative

Fall 2020 Clark University Admissions Video Outreach, Chemistry Faculty Representative

Nov. 5th, 2020 Clark University - Center for Excellence in Teaching and Learning, Invited Presenter
"Evaluating Student Learning: Exams and Alternatives"

Spring 2020 – Clark University Steering Committee, Member-at-large (Elected, 3-year term)

Spring 2020 Vice President of Marketing and Communications Search Committee, Faculty Representative

Spring 2020 Clarkies in Cars Getting Coffee, Science Faculty Representative

Sept. 11th, 2019 Applying for Academic Positions: Tips for Application Package, Skype and On-Campus Interviews, Panelist

Fall 2018 Clark University Admissions Video Outreach, Chemistry Faculty Representative

Sept. 29th, 2018 Applying for Academic Positions: Tips for Application Package, Skype and On-Campus Interviews, Panelist

Spring 2018 Director of Academic Advancement Search Committee, Faculty Representative

Spring 2018 – 19 Clark University College Board (2-year term)

Fall 2017 – 18 Clark University Library Committee, Chair (1.5-year term)

Fall 2016 – 17 Clark University Library Committee, Natural Sciences Faculty Representative (3-year term)

Spring'16 – Fall'18 Clark University Editorial Advisory Board (EAB), Natural Sciences Faculty Representative (3-year term)

Fall 2016 – 17 Clark University Wellness Committee (CU Fit), Faculty Representative

Oct. 24th, 2016 Science Faculty Focus Group Member with Neustadt Creative Marketing, Chemistry Dept. Representative
Part of Clark University's Planning Initiative to enhance Clark's external image & future marketing strategies

Departmental and Interdepartmental Service at Clark University

2021 – present Carlson School of Chemistry & Biochemistry – Chemistry Graduate Program Coordinator

2020-21 Department of Biology – Assistant Professor of "Evolutionary Biology" Search Committee, External

Summer 2019 Clark University Chemistry Website Redesign, Chemistry Faculty Representative

Feb. 2nd, 2019 LEEP Career Development – Life After Clark: *"Is Graduate School Right for Me?"*, Science Faculty Panelist

Oct. 10th, 2018 Clark University Majors Fair, BCMB Program Representative

Spring 2018 Clark University Admitted Student Open House, Faculty and Chemistry/BCMB Program Panelist

April 8th, 2017 Organizer, Host, & Speaker*, 27th Annual Harry Allen Symposium on "Protein Structure & Disease"

Speakers: Christopher D. Lima, Ph.D. (Memorial Sloan Kettering Cancer Center, Structural Biology Program, HHMI)
Celia A. Schiffer, Ph.D. (UMass Medical School, Biochemistry & Molecular Pharmacology)
Danny T. Huang, Ph.D. (University of Glasgow, CRUK Beatson Institute)
**Donald E. Spratt, Ph.D. (Clark University, Chemistry & Biochemistry) – stepped in for Dr. Schiffer (ill)*

Summer 2016 Significant Revisions to the BCMB 271L – Biochemistry I Lab and Rewrite of the BCMB 271L Lab Manual

Devised 4 labs to include updated modern techniques and procedures. Clarified protocols to improve student understanding of lab techniques/procedures.
Cleaned out and reorganized lab space and reagents in the BCMB Chemical Storage/Prep Room
Obtained competitive quotes from vendors & negotiated preferred pricing for reagents
Wrote a petition letter to the Provost of Clark University in July 2016 asking for an increase in the annual BCMB teaching funds (approved August 2016, increased from $10,000/yr to $15,000/yr) to improve student learning

2016 – present Graduate Student Thesis/Dissertation Defense Committee Member

Ph.D. Student Defenses
Yaya Wang – Ph.D. BCMB, July 14th, 2017
Xiang Ren – Ph.D. Biology, June 8th, 2016

Ph.D. Student Thesis Committee
Fadwa Mekkaoui – Ph.D. BCMB (August 2021-present)
Kelly Waters – Ph.D. BCMB (August 2020-present)
Emma Kane – Ph.D. BCMB (August 2019-present)
Merc Kemeh – Ph.D. BCMB (July 2019-present)
Xiaoli Mo – Ph.D. BCMB (March 2018-present)
Ruben Neves – Ph.D. BCMB (August 2017-present)
Steven Beasley – Ph.D BCMB (August 2016-present)

Accelerated M.S. Student Thesis Committee
Elizabeth Bosia (June 2021-present)
Rafael Levin (June 2021-present)
Slesha Shrestha (June 2021-present)
Tyler Vincent (June 2021-present)
Sean Munroe (June 2020-present)
Sam Brody (Sept 2019-present)

Accelerated M.S. Student Defenses
Bethany Lee – M.S. BCMB, July 15th, 2021
Saadman Islam – M.S. BCMB, July 29th, 2020
Young Sun Lee – M.S. BCMB, July 23rd, 2020
Justine Bohl – M.S. BCMB, July 6th, 2020
Rylee Simons – M.S. BCMB, June 9th, 2020
Kayla Rich – M.S. BCMB, June 4th, 2020
Zaza Gelashvili – M.S. BCMB, June 1st, 2020
Emily Ladda – M.S. BCMB, May 15th, 2020
Micheal Kebede – M.S. BCMB, July 16th, 2019
Aaron Bogle – M.S. BCMB, June 13th, 2019
Jeanmarie Loss – M.S. BCMB, June 12th, 2019
Misa Mai – M.S. BCMB, June 6th, 2019
Lara Prosterman – M.S. BCMB, May 17th, 2019
Diana Argiles-Castillo – M.S. BCMB, May 14th, 2019
Noah Schwaegerle – M.S. BCMB, August 15th, 2018
Emilie Ogisu – M.S. Biology, June 29th, 2018
Rachel Orlomoski – M.S. Biology, June 19th, 2018
Claire Krasinski – M.S. BCMB, April 5th, 2018
Shivani Patel – M.S. BCMB, July 17th, 2017
Ashley Burke – M.S. BCMB, July 12th, 2017
Alexander Wall – M.S. BCMB, July 7th, 2017
Andrew Bellesis – M.S. BCMB, May 22nd, 2017

2017 – 2018 Clark University Science Summer Undergraduate Student Selection/Organizational Committee, Chemistry Rep.

Community Outreach @ Clark University

2020 – present Presenter and Host – Worcester County High School STEM Careers Outreach

Led high school students in an online discussion on positive ways to approach careers in STEM
2021: June 29th - Girls Inc. Eureka! STEM Summer Program (15 9th Grade Girls)
March 24th – Mass Academy of Math & Science (34 ADP Science Juniors & Seniors)
Feb. 5th – Doherty Memorial High School (10 ADP Chemistry & Biology Students)
Feb. 3rd – Nipmuc Regional High School (16 ADP Biology Students)
Feb. 2nd & 8th – Wachusett Regional High School (21 ADP Chemistry & Biology Seniors, 35 Chemistry Juniors)
Jan. 28th & 29th – North High School (15 ADP Biology and 17 ADP Chemistry Students)
Jan. 25th – University Park Campus School (54 ADP Chemistry, Physics, and Introductory Chemistry Students)
Jan. 25th & Feb 2nd – South High School (23 ADP Chemistry and 28 Physics Students)
Jan. 22nd – Burncoat High School (22 ADP Biology Students)
Jan. 19th & Feb. 9th – Worcester Technical High School (20 Junior and 9 Sophomore Biotechnology Students)
2020: Dec. 18 & 21st – Leicester High School (18 ADP Biology Students)
July 14th – Girls Inc. Eureka! STEM Summer Program (18 9th Grade Girls)

2019 – present Organizer and Host – Worcester County High School Protein Chemistry/STEM Careers Field Trip

Led high school students through an experiential "Affinity Chromatography" protein chemistry laboratory, led a discussion on careers in STEM, and gave a tour of the facilities in the Carlson School of Chemistry & Biochemistry
2020: Jan. 8th – Nipmuc Regional High School (16 ADP Biology Students)

2019: Dec. 18th – University Park Campus High School (17 ADP Chemistry Students)
Dec. 12th & 13th – South High School (41 ADP Biology Students)
May 8th & 15th – Worcester Technical High School (35 Biotechnology Students)

Summer 2019 Research Mentor - Worcester Technical High School (WTHS) Student – Peter Chelstowski
Mentored and trained a WTHS student how to purify proteins and conduct biochemical experiments

Feb. 2019,'20,'21 Massachusetts Academy of Math and Science STEM Fair, Project Judge, Worcester Polytechnic Institute

Dec. 8th, 2017 High School Student Outreach, Biochemistry Training
Two Grade 9 students from Leicester High School spent an afternoon working in my lab for course credit.

Service and Community Outreach prior to Clark University

2012, 2014 National Scholarship Program – Admissions Evaluator, Western University

2009 – 2014 UWO Biochemistry Outreach Program – Demonstrator, led high school students through a week-long biotechnology module

2009, 2010 Margaret Moffat Research Day – Judge, Western University

2005 – 2006 President of the Chemistry Graduate Student Society, University of Waterloo

2004 – 2005 Social Coordinator of the Chemistry Graduate Student Society, University of Waterloo

CONTINUING EDUCATION

June 2nd, 2021 Isotope Day 2021, Cambridge Isotopes Inc. (Virtual Event)

February 10th, 2021 Creating an Inclusive and Resilient Future in Chemistry Education, American Chemical Society Webinar

December 14-15th, 2020 Anti-Racism Workshop – Clark Faculty Training, National Conference of Community and Justice

August 13th, 2020 Key Pedagogical Principles for Creating an Engaging Online STEM Course, HECCMA

Summer 2020 Faculty Professional Development Series: Adapting Your Teaching to Alternate Modalities and Realities, Clark University

Summer 2020 Online Course: Teaching in Different Modalities, Clark University

March 12th, 2019 GE Healthcare – Innovations in Protein Research, Cambridge MA

April 11th, 2018 Planning and Writing Successful Grant Proposals, AtKisson Training Group, LLC
Worcester Polytechnic Institute, Worcester MA

Fall 2017 – present Diversity & Inclusion Certificate Program, Clark University, MA
Sessions attended: White Anti-Racist Allyship • Historical Overview: Power, Privilege, and Oppression
Best Practices for Faculty and Staff Hiring • Classroom to Community: How do you see my disABILITY?
Whiteness, Privilege, and the Social Construction of Race

June 1st, 2017 Biological Design Center Kickoff Symposium, Boston University, Boston MA

May 11-13th, 2016 2016 NIH Regional Seminar: Program Funding and Grants Administration, Baltimore MD

2009 – 2015 Future Professor Workshop Series, Western University • London ON, Canada

2010 – 2015 Continuing Professional Development, Schulich School of Medicine & Dentistry, Western University • London ON, Canada

August 15-20th, 2011 Biomolecular NMR Training Course, University of Alberta • Edmonton AB, Canada
NANUC – National High Field Nuclear Magnetic Resonance Centre

August 16-20th, 2010 Advanced Course on Multidimensional NMR, James Cook University • Cairns QLD, Australia

October 23rd, 2009 OMRI Postdoctoral Workshop, MaRS Discovery District • Toronto ON, Canada

Sept. 2002 – April 2003 Undergraduate Research Assistant, Mount Allison University • Sackville NB, Canada
Supervisor: Dr. Andrew G. Grant

May-August 2001, 2002 Undergraduate Research Assistant – Enviropig™ Project, University of Guelph • Guelph ON, Canada
Supervisors: Dr. Cecil W. Forsberg and Dr. Ming Z. Fan