

# NICHOLAS BORCHERDING, M.S.

P: (563)-370-2766  
E: nicholas-borcherding@uiowa.edu  
A: 470 Hawaii Ct, Iowa City, IA 52246

## Education

---

### Medical Doctorate

University of Iowa, Iowa City, IA

June 2014 – May 2020 (expected)

### Cancer Biology, Ph.D.

University of Iowa, Iowa City, IA

June 2016 – May 2020 (expected)

### Pathology, M.S.

University of Iowa, Iowa City, IA

August 2012 – June 2014

### Nutritional Science, B.S.

Iowa State University, Ames, IA

January 2009 – May 2012

## Research Experience

---

### Graduate Research Assistant

Program: Cancer Biology Graduate Program, Ph.D.

Mentor: Dr. Weizhou Zhang

Department of Pathology

University of Iowa, Iowa City, IA

June 2016 – December 2018

- **Thesis:** Big Data Analytics and Cancer Biology: Lessons in taking science from the processor to the patient.

### Graduate Research Assistant

Program: Pathology Graduate Program, M.S.

Mentor: Dr. Weizhou Zhang

Department of Pathology

University of Iowa, Iowa City, IA

August 2012 – June 2014

- **Thesis:** Noncanonical Wnt signaling in breast cancer initiation and progression.

### Undergraduate Research Assistant

Mentor: Dr. Matthew Rowling and Dr. Kevin Schalinske

Department of Food Science and Human Nutrition

Iowa State University, Ames, IA

May 2010 – August 2012

- **Focus:** Interventional use of fermentable starches in diabetic nephropathy.

### Louise Rosenfeld Undergraduate Research Intern

Mentor: Dr. Matthew Rowling

Department of Food Science and Human Nutrition

Iowa State University, Ames, IA

August 2011 – December 2011

- **Focus:** JAK2/STAT5 activation by Holo-RBP/STRA6 in breast and ovarian carcinoma.

## Publications

1. Kluz, P.N., Kolb, R., Xie, Q., **Borcherding, N.**, Liu, Q., Wang, L., Zhang, Y., Li, W., Stipp, C., Gibson-Corley, K.N., Zhao, C., Qi, H.H., Bellizzi, A., Tao, A.W., Sugg, S., Weigel, R.J., Shen, X., Zhang, W. (2020). Cancer cell-intrinsic function of CD177 in attenuating  $\beta$ -Catenin signaling. *Oncogene*. In Press.
2. **Borcherding, N.\*** & Bormann, N. (2020). scRepertoire: A R-based toolkit for single-cell immune receptor analysis. *F1000Research*. In Press. \*first and corresponding author
3. Liu, Q., **Borcherding, N.**, Shao, P., Maina, P., Zhang, W., & Qi, H. (2019) Contribution of synergism between PHF8 and HER2 signaling to breast cancer development and drug resistance. *EBioMedicine*. PMID: 31923801.
4. Xiu, Y., Qianze Dong, Q., Fu, L., Bossler, A., Tang, X., Boyce, B., **Borcherding, N.**, Byrd, J., Leidinger, M., Sardina, J.L., Xue, H., Li, Q., Feldman, A., Aifantis, I., Boccalatte, F., Khoury, J., Wang, W., Hu, S., Yuan, Y., Wang, E., Yuan, J., Colgan, J., Habelhah, H., Waldschmidt, T., Muschen, M., & Zhao, C. (2019). Concurrent activation of NF- $\kappa$ B and Notch signaling is sufficient to induce B cell transformation and enables B-myeloid conversion. *Blood*. PMID: 31697816
5. Wu, V., Kiriazov, B., Koch, K., Gu, V., Beck, A., **Borcherding, N.**, Li, T., Addo, P., Wehrspan, Z., Zhang, W., Braun, T., Brown, B., Band, V., Band, B., Kulak, M., & Weigel, R. (2019). A TFAP2C Gene Signature is Predictive of Outcome in HER2-positive Breast Cancer. *Molecular Cancer Research*. PMID: 31619506
6. Bi, J., Yang, S., Li, L., Dai, Q., **Borcherding, N.**, Wagner, B.A., Buettner, G.R., Spitz, D.R., Leslie, K.K., Zhang, J., & Meng, X. (2019). Metadherin (MTDH) Enhances Vulnerability of Cancer Cells to Ferroptosis. *Cell Death and Disease*. PMID: 31527591.
7. Liu, Q.\*, **Borcherding, N.\***, Shao, P., Cao, H., Zhang, W., & Qi, H. (2019). Novel effectors mediating the pro-migratory role of TGF- $\beta$  signaling. *Molecular Basis of Disease*. In Press. \*co-primary authors
8. Pandey, G.\*, **Borcherding, N.\***, Kolb, R., Kluz, P., Li, W., Sugg, S., Zhang, J., Lai, D., & Zhang W. (2019). ROR1 potentiates FGFR signaling in basal-like breast cancer. *Cancers*. PMID: 31137681. \*co-primary authors
9. **Borcherding, N.**, Voigt, A., Liu, V., Link, B.K., Zhang, W., & Jabbari, A. (2019) Single-cell profiling of cutaneous T-cell lymphoma reveals underlying heterogeneity associated with disease progression. *Clinical Cancer Research*. PMID: 30718356
10. Kolb, R., Kluz, P., Wei, T.Z., **Borcherding, N.**, Bormann, N., Balczak, L., Zhu, P., Davies, B., Gourronc, F., Gibson-Corley, K., Klingelhutz, A., Tan, N.S., Sutterwala, F., Vishwakarma, A., Liu, L., Ge, X., Jiang, B., Zhu, Y., Shen, X., & Zhang, W. (2019). Obesity-associated inflammation promotes angiogenesis and breast cancer via angiopoietin-like 4. *Oncogene*. PMID: 30518876
11. Vikas, P., **Borcherding, N.**, & Zhang, W. (2019). The Clinical Promise of Immunotherapy in Triple-Negative Breast Cancer. *Clinical Management and Research*. PMID:30573992
12. **Borcherding, N.**, Bormann, N., Voigt, A., & Zhang, W. (2018). TRGAted: A web tool for survival analysis using protein data in the Cancer Genome Atlas. *F1000Research*. PMID: 30345029
13. **Borcherding, N.\***, Cole, K.\*, Kluz, P., Pandey, G., Jorgensen, M., Kolb, R., Bellizzi, A., & Zhang, W. (2018). Reevaluating E-Cadherin and  $\beta$ -Catenin: A pan-cancer proteomic approach with emphasis on breast cancer. *American Journal of Pathology*. PMID: 29879416 \*co-primary authors
14. **Borcherding, N.**, Kolb, R., Gullicksrud, J., Vikas, P. Zhu, Y., & Zhang, W. (2018). Keeping tumors in check: A mechanistic review of clinical response and resistance to immune checkpoint blockade in cancer. *Journal of Molecular Biology*. PMID: 29800567.
15. Sinha, S., **Borcherding, N.**, Renavikar, P., Crawford, M., & Karandikar. (2018). Autoimmune disease risk SNP rs2281808 in *Sirpy* is associated with heightened effector state and greater cytotoxic potential in human CD8 T-cells. *Scientific Reports*. PMID: 30337675.
16. Xiu, Y., Li, Q., Li, F., Boyce, B., **Borcherding, N.**, Xue, X., & Zhao, C. (2017). Stabilization of NF- $\kappa$ B-inducing kinase suppresses MLL-AF9-induced acute myeloid leukemia. *Cell Reports*. PMID: 29320732.
17. Liu, Q., Kulak, M., **Borcherding, N.**, Maina, P., Zhang, W., Weigel, R., & Qi, H. (2017). A novel *HER2* gene-body enhancer contributes to *HER2* expression. *Oncogene*. PMID: 29035388.
18. Fleagle, T., **Borcherding, N.**, & Hoffmann, D. (2017) A series of Custom 3D Anatomy Videos to Improve Preparation for Gross Anatomy Lab Dissection. *Anatomical Science Education*. PMID: 29283505
19. Kolb, R., Phan L., **Borcherding, N.**, Liu, Y., Yuan, F., Janowski, A.M., Xie, Q., Markan, K.R., Li, W., Potthoff, M.J., Fuentes-Mattei, E., Knudsen, M., Lee, M., Yeung, S., Cassel, S., Sutterwala, F., &

- Zhang, W. (2016). Obesity-associated NLRC4 inflammasome activation drives breast cancer progression. *Nature Communications*. PMID: 27708283.
20. **Borcherding, N.\***, Rudolph, M.\*, Tierney, A.\*, Vyn, & R., Hoffmann. (2016) Content evaluation, usage profile and student preferences related to a medical student wiki for student-authored learning resources. *Medical Science Educator*: 1-10. \*co-primary authors
  21. Kusner, D.\*, **Borcherding, N.\***, & Zhang, W. (2016) Paracrine WNT5A signaling in the mammary healthy and neoplastic mammary tissue. *Molecular & Cellular Oncology*. PMID: 27308558. \*co-primary author
  22. **Borcherding, N.**, Bormann, N., Kusner, D., Kolb R., & Zhang, W. (2015) Transcriptome analysis of basal and luminal tumor-initiating cells in ErbB2-driven breast cancer. *Genomic Data*. PMID: 26167451.
  23. Schaefer, K., Toral, M., Velez, G., Cox, A., Baker, S., **Borcherding, N.**, Colgan, D., Bondada, V., Mashburn, C., Yu, C., Geddes, J., Tsang, S., Bassuk, A., & Mahajan, V. (2016). Calpain-5 expression in the retina localizes to photoreceptor synapses. *Investigative Ophthalmology and Visual Science*. PMID: 27152965.
  24. **Borcherding, N.\***, Kusner, D.\*, Kolb, R., Xie, Q., Li, W., Yuan, F., Velez, G., Askeland, R., Weigel, R.J., & Zhang, W. (2015). Paracrine WNT5A Signaling Inhibits Expansion of Tumor-Initiating Cells. *Cancer Research*. PMID: 25769722. \*co-primary authors
  25. Mahauad-Fernandez, W.D.\*, **Borcherding, N. C.\***, Zhang, W., & Okeoma, C.M. (2015). Bone Marrow Stromal Antigen 2 (BST-2) DNA Is Demethylated in Breast Tumors and Breast Cancer Cells. *PLoS One*. PMID: 25393878. \*co-primary authors
  26. Reed, S.M., Hagen, J., Muniz, V.P., Rosean, T.R., **Borcherding, N.**, Sciegienka, S., Goeken, J.A., Naumann, P.W., Zhang, W., Tompkins, V.S., Janz, S., Meyerholz, D.K., & Quelle, D.E. (2014). NIAM-deficient mice are predisposed to the development of proliferative lesions including B-cell lymphomas. *PLoS One*. PMID: 25393878
  27. Xie, Q., Klesney-Tait, J., Keck, K., Parlet, C., **Borcherding, N.**, Kolb, R., Li, W., Tygrett, L., Waldschmidt, T., Olivier, A., Chen, S., Liu, G. H., Li, X., & Zhang, W. (2015). Characterization of a novel mouse model with genetic deletion of CD177. *Protein Cell*. PMID: 25359465
  28. **Borcherding, N.**, Kusner, D., Liu, G. H., & Zhang, W. (2014). ROR1, an embryonic protein with an emerging role in cancer biology. *Protein Cell*. PMID: 24752542.
  29. Wu, X., Zhang, W., Font-Burgada, J., Palmer, T., Hamil, A. S., Biswas, S. K., Poidinger, M., **Borcherding, N.**, Xie, Q., Ellies, L. G., Ltyle, N. K., Wu, L. W., Fox, R. G., Yang, J., Dowdy, S. F., Reya, T., & Karin, M. (2014). Ubiquitin-conjugating enzyme Ubc13 controls breast cancer metastasis through a TAK1-p38 MAP kinase cascade. *Proceedings of the National Academy of Science*. PMID: 25189770.
  30. Smazal, A. L.\*, **Borcherding, N. C.\***, Anderegg, A. S., Schalinske, K. L., Whitley, E. M., & Rowling, M. J. (2013). Dietary resistant starch prevents urinary excretion of 25-hydroxycholecalciferol and vitamin D-binding protein in type 1 diabetic rats. *Journal of Nutrition*. PMID: 23677864. \*co-primary authors
  31. Zhang, W., Tan, W., Wu, X., Poustovoitov, M., Strasner, A., Li, W., **Borcherding, N.**, Ghassemian, M., & Karin, M. (2013). A NIK-IKKalpha module expands ErbB2-induced tumor-initiating cells by stimulating nuclear export of p27/Kip1. *Cancer Cell*. PMID: 23602409.

## Submitted Manuscripts

1. Kolb, R., De, U., Khan, S., Luo, Y., Kim, M., Yu, H., Wu, C., Zhang, X., Zhang, X., **Borcherding, N.**, Zheng, G., Zhou, D., & Zhang, W. (2020). Targeting tumor-infiltrating regulatory T cells by PROTAC-mediated degradation of BCL-XL.
2. **Borcherding, N.**, Crotts, S.B., Ortolan, L.S., Bormann, N.L., Jabbari, A. (2020). A transcriptomic atlas of murine and human alopecia areata identifies immune cell profiles predictive of human disease state.
3. Gu, V.W., Cho, E., Thompson, D.T., Cassady, V., **Borcherding, N.**, Koch, K.E., Wu, V.T., Lorenzen, A.W., Kulak, M.V., Williams, T., Zhang, W., Weigel, R.J. (2020). AP-2γ is Required for Maintenance of Pluripotent Mammary Stem Cells.
4. Cheng, Y., **Borcherding, N.**, Ogunsakin, A., Lemke-Miller, C.D., Gibson-Corley, K.N., Rajan, A., Wongpattaraworakul, W., Chan, C.H., Salem, A.K., Weiner, G.J., Simons, A.L. (2020). The anti-tumor effects of cetuximab in combination with motolimod are T cell dependent and vary based on sex.
5. Vikas, P.\*, **Borcherding, N.\***, Chennamadhani, A., Garje, R. (2020). Therapeutic potential of combining PARP inhibitor and immunotherapy in solid tumors. \*co-primary authors

6. Vishwakarma, A., **Borcherding, N.**, Chimenti, M., Vishwakarma, P., Nepple, K., Salem, A., Jenkins, R.W., Zhang, W., Zakharia, Y. (2020) Mapping Immune Landscape in Clear Cell Renal Carcinoma by single-cell genomics.
7. **Borcherding, N.\***, Ahmed, K.A.\*, Voigt, A.P., Vishwakarma, V., Kolb, R., Kluz, P., Pandey, P., De, U., Kim, M., Drashansky, T., Helm, E.Y., Zhang, X., Gibson-Corley, K.N., Klesney-Tait, J., Zhu, Y., Lu, J., Lu, J., Huang, X., Cheng, J., Avram, D., Zhou, D., Bacher, R., Zheng, S., Wu, X., Zakharia, Y., Weizhou Zhang, W. (2020). Understanding the heterogeneity and potentially targeting of human tumor-infiltrating regulatory T cells. \*co-primary authors

## Textbooks or Chapters

- Zhang, W., **Borcherding, N.**, Kolb, R. (2019) IL-1 signaling in the tumor microenvironment. Tumor Microenvironment. New York City, NY: Springer International Publishing. ISBN: 978-3-030-34025-4.
- Schalinske, K. & **Borcherding, N.** (2016). Advanced Nutrition and the Regulation of Metabolism. San Diego, CA: *Cognella Academic Publishing*. ISBN: 978-1-5165-1468-7

## Software

- **Borcherding, N.** (2020). scRepertoire, an R-based toolkit for single-cell immune profiling. DOI:10.5281/zenodo.3612216.
- **Borcherding, N.** (2017). TRGAted, using TCGA protein-level data for large-scale survival analysis. R Shiny App. DOI:10.5281/zenodo.1323828.

## Presentations

---

### Invited Presentations

- **Borcherding, N.**, Voigt, A., Liu, V., Link, B.K., Zhang, W., & Jabbari, A. (May, 2019) Single-cell profiling of cutaneous T-cell lymphoma reveals underlying heterogeneity associated with disease progression. Presented at the Society for Investigative Dermatology Annual Meeting in Chicago, Illinois.
- **Borcherding, N.**, Transcriptional Heterogeneity in cancer-associated regulatory T cells is predictive of survival. Presented at the Single-Cell RNA sequencing Symposium by the Iowa Institute of Genetics, Iowa City, Iowa.
- **Borcherding, N.** Paracrine Regulation of Breast Cancer Tumorigenesis. (2016, April). Presented at the Midwestern Association of Graduate Schools Annual Conference in Chicago, Illinois.

### Research Presentations

- **Borcherding, N.**, Jo, S., Zhang, W. Targeting mismatch repair in immunotherapy for basal-like breast cancer (2017, January). Presented at the Holden Comprehensive Center Translational Conference at the University of Iowa.
- **Borcherding, N.** The Potential Dichotomous Functions of  $\beta$ -Catenin in Breast Cancer Molecular Subtypes (2016, November). Presented at the MCB seminar at the University of Iowa.
- **Borcherding, N.** Paracrine Regulation of Breast Cancer Tumorigenesis. (2016, March). Presented at the Jakobsen Graduate Conference for the University of Iowa.
- **Borcherding, N.** The potential of noncanonical WNT as a target for triple-negative breast cancer. (2015, July). Presented at the University of Iowa MSTP Annual Retreat.
- **Borcherding, N.** Aptamer-siRNA chimera generation for T regulatory cell inhibition. (2014, August). Presented at the University of Iowa MSTP Annual Retreat.
- **Borcherding, N.** Noncanonical Wnt Signaling in Breast Cancer Initiation and Progression. (2014, May). Presented in fulfillment of Department of Pathology Graduate Program thesis requirements.
- **Borcherding, N.**, Kusner, D., Kolb R., Li W., Zhang W. (2014, April). ROR1/WNT5a axis role in breast cancer initiation and progression. Presented at the Department of Pathology Graduate Research Seminar.

- **Borcherding, N.**, Xie Q., Kolb R., Li W., Zhang W. (2013, November). Wnt5a, a basal-specific tumor suppressor in ErbB2+ Breast Cancer. Presented at the Department of Pathology Graduate Research Seminar.
- **Borcherding, N.**, Xie Q., Kolb R., Li W., Zhang W. (2013, April). Characterization of Tumor-initiating Cell population in HER2+ Breast Cancer. Presented at the Department of Pathology Graduate Research Seminar.
- **Borcherding, N.**, Xie Q., Li W., Zhang W. (2012, November). Genetic Signature of ErbB2+ Cell of Origin(s). Presented at the Department of Pathology Graduate Research Seminar.

## Abstracts

---

### National or Regional Conference Abstracts

- **Borcherding, N.**, Crotts, S., Ortolan, L., Bormann, N., & Jabbari, A. (2020, May). Single-cell mRNA sequencing of murine and human alopecia areata identifies immune cell profiles predictive of human disease state. Presented at the Academy of Clinical Laboratory Physicians and Scientists Annual Meeting in Iowa City, IA.
- **Borcherding, N.**, Voigt, A., Liu, V., Link, B.K., Zhang, W., & Jabbari, A. (2019, May) Single-cell profiling of cutaneous T-cell lymphoma reveals underlying heterogeneity associated with disease progression. Presented at the Society for Investigative Dermatology Annual Meeting in Chicago, IL.
- **Borcherding, N.**, Bormann, N., Zhang, W. (2018, January). Using data analytics to predict and improve cancer immunotherapy response. Presented at the American Physician Scientist Association Midwest Regional Meeting in Iowa City, IA.
- **Borcherding, N.**, Jo, S., Zhang, W. (2017, October). Targeting mismatch repair for basal-like breast cancer. Presented at the Cancer Biology Training Consortium Annual Meeting in Portland, OR.
- Feagle, T., **Borcherding, N.**, Hoffmann, D. Students Prefer 3D Anatomy Videos for Prelab Preparation Compared to Traditional Resources and Usage is Related to Class Performance. Presented at the annual Experimental Biology Conference in Chicago, IL.
- Kolb, R., Kluz, P., Wei, T.Z., Bormann, N., **Borcherding, N.**, Markan, K., Pothoff, B., Tan, N.S., Sutterwala, F., & Zhang W. (2017, February). IL-1beta promotes obesity-driven breast cancer progression through the upregulation of Angptl4 in adipocytes. Presented at Inflammation-driven Cancer: Mechanisms to Therapy Keystone Symposia in Keystone, CO.
- Schaefer, K.A., Toral, M., Velez, G., Cox, A., Baker, S., **Borcherding, N.**, Colgan, D.F., Smits, M.M., Bondada, V., Mashburn, C.B., Yu, C., Geddes, J., Tsang, S.H., Bassuk, A.G., Mahajan, V.B. (2016, June). Calpain-5 expression in the retina localizes to photoreceptor synapses. Presented at the FASEB Conference for The Biology of Calpains in Health and Disease in Big Sky, MT.
- Kolb, R., Phan, L., **Borcherding, N.**, Liu, Y., Yuan, F., Janowski, A.M., Xie, Q., Markanm K., Li, W., Potthoff, M., Fuentes-Mattei, E., Ellies, L., Knudson, M., Lee, M., Yeung, S., Cassel, S., Sutterwala, F., & Zhang, W. (2016, January). Obesity-induced Nlr4 inflammasome promote angiogenesis in breast cancer. Presented at the AACR Special Conference: The Function of Tumor Microenvironment in Cancer in San Diego, CA.
- Kolb, R., **Borcherding, N.**, Liu, Y., Yuan, F., Xie, Q., Sutterwala, F., Zhang, W. (2015, April). NLRC4 inflammasome promotes breast cancer progression in diet-induced obese mice. Presented at the American Association for Cancer Research Annual Meeting in Philadelphia, PA.
- **Borcherding, N.**, Kusner, D., Kolb, R., Xie, Q., Zhang, W. (2015, April). Paracrine Wnt5a signaling inhibits the expansion of tumor initiating cells via Ryk/TGFβR/Smad2. Presented at the ASCI/AAP/APSA Annual Joint Meeting in Chicago, IL.
- **Borcherding, N.**, Kusner, D., Kolb, R., Xie, Q., Zhang, W. (2014, April). Wnt5a/ROR1 Axis in Triple Negative Breast Cancer Progression and Potential Therapy. Presented at the American Association for Cancer Research Annual Meeting in San Diego, CA.
- Kolb, R., Liu, Y., Xie, Q., **Borcherding, N.**, Li, W., Zhang, W. (2014, April). Inflammasome activation in obesity-associated breast cancer progression. Presented at the American Association for Cancer Research Annual Meeting in San Diego, CA.

- Xie, Q., **Borcherding, N.**, Kolb, R., Zhang, W. (2014, April). CD177, A novel Metastasis Suppressor of Breast Cancer. Presented at the American Association for Cancer Research Meeting, San Diego, CA.

## Teaching Experience

---

### Medical School:

**Teaching Distinction Track** (In Progress) – University of Iowa

Mentor: Dr. Darren Hoffmann

**Focus:** Improving basic science education through medical education research and delivery technologies.

**Liaison Committee** – University of Iowa

- 2014 MED 8123, “Foundations of Cellular Life.” Drs. Darren Hoffmann and Nathan Swaile.

### Medical Tutor

- 2015 MED 8124, “Mechanisms of Health and Disease I” Drs. Andy Russo and Brad Gelbach

### Small Group Facilitator

- 2017 MED 8222, “Medicine and Society III”
- 2016 MED 8222, “Medicine and Society III”

### Undergraduate University:

**Undergraduate Teaching Assistant** - Iowa State University

- 2012 FSHN 492, “Research Concepts in Human Nutrition.” Dr. Matthew Rowling
- 2011 FSHN 360, “Advanced Human Nutrition and Metabolism.” Dr. Kevin Schalinske
- 2011 FSHN 265, “Nutrition for a Healthy and Active Lifestyle.” Dr. Matthew Rowling

### Enrichment Activities

- 2018 Presenter, Targeting Cancer Mini Medical School  
Carver College of Medicine, University of Iowa
- 2017 Performance and Accreditation Tracker Developer  
Carver College of Medicine, University of Iowa
- 2015-17 Medical School Curriculum Development Assistant,  
Carver College of Medicine, University of Iowa
- 2015 Teaching Your Research Workshop,  
Graduate College, University of Iowa
- 2015-16 Undergraduate Research Festival Poster Judge,  
Iowa Center for Research by Undergraduates, University of Iowa

## Committees

---

### National

- 2016-17 First Aid/USMLE-Rx Student Council

### University

- 2019-20 Alpha Omega Alpha Selection Committee  
Carver College of Medicine, University of Iowa
- 2018-19 Presidential Charter Committee Review  
University of Iowa Graduate and Professional Student Government
- 2016-17 LCME Accreditation Review Taskforce, Carver College of Medicine, University of Iowa  
Member, Standard 6: Competencies, Curricular Objectives, and Curricular Design

- 2016-17 Medical Education Council, Carver College of Medicine, University of Iowa  
Served on the Committee for Biomedical Informatics Integration
- 2016-17 Student Education Council, Carver College of Medicine, University of Iowa
- 2015-18 Presidential Charter Committee for Recreational Services, University of Iowa  
Graduate Student Member  
Chair of Committee 2017-2018
- 2014-18 University of Iowa Research Council  
Graduate Student Member  
Served on the Research Reward Subcommittee (2014)  
Served on the Undergraduate Research Subcommittee (2014-15)  
Served on the Research Efficiency Subcommittee (2016)
- 2013-16 Graduate and Professional Student Government, University of Iowa  
Serving on the Grants Committee
- 2013-14 Graduate Student Senate, University of Iowa  
Department of Pathology Senator  
Served on the Jakobsen Graduate Conference Committee
- 2011-12 College of Human Sciences Council, Iowa State University  
Served on the Grant and Service Committee

### **Departmental**

- 2014-15 Retreat and Research Conference Committee  
Medical Scientist Training Program, University of Iowa
- 2011-12 Undergraduate Seat on the Technology Committee, Iowa State University  
Department of Food Science and Human Nutrition

## **Professional Memberships**

---

### **National**

- 2014- Full Member  
American Physician Scientist Association
- 2014- Student Member  
American Medical Association
- 2014- Member  
American Medical Student Association
- 2014- Student Member  
American Association for the Advancement of Science
- 2014- Member in Training  
American Society of Clinical Oncology
- 2013- Associate Member  
American Association of Cancer Research

### **Invited Manuscript Review**

- Cancer Research, AACR Journal 2019
- Journal of Medical Internet Research, JMIR Journal, 2019

### **Institutional/Regional**

- 2014- Trainee Member  
Holden Comprehensive Cancer Center, University of Iowa Carver College of Medicine  
Member of Cancer Immunology and Immunotherapy Program
- 2014- Member  
Iowa Medical Society

## Funding Awards

---

### Research Funding

#### National

- 2017-20 NIH F30 CA206255 (Principle Investigator)  
Title: The role of paracrine WNT5A/Ryk in ErbB2-driven tumorigenesis,  
Award Amount: \$151,150
- 2015-16 American Medical Association Foundation Research Seed Grant (Principle Investigator)  
Title: Paracrine non-canonical Wnt signaling in breast cancer  
Award Amount: \$4,895
- 2014-17 NIH T32 GM007337, University of Iowa, Medical Science Training Program

#### Institutional

- 2017 Oberley Seed Grant for Experiment Therapeutics (Co-Principal Investigator)  
Title: Targeting mismatch repair for immunotherapy in basal-like breast cancer,  
Award Amount: \$20,000
- 2015 Graduate and Professional Student Government Research Grant (Principle Investigator)  
Title: Wnt5a/Ryk axis in breast cancer,  
Award Amount: \$1,460

### Travel Funds

- 2017 Holden Comprehensive Cancer Center Travel Award
- 2015 Graduate and Professional Student Government Travel Award
- 2014 Executive Council for Professional and Graduate Students Travel Award
- 2014 Holden Comprehensive Cancer Center Travel Award

### Other Funds

- 2015 Carver College of Medicine Curriculum Improvement, Award Amount: \$5000

## Recognitions

---

### Research Awards

- 2018 Finalist, Graduate Research Excellence Award in Biological Sciences  
Vice President of Research and Economic Development, University of Iowa
- 2017 Richard G. Lynch, MD Award for Pathology, Medical Student Research Day  
Carver College of Medicine, University of Iowa
- 2017 Research Poster Award Winner, Holden Comprehensive Cancer Center Annual Retreat  
University of Iowa Hospitals and Clinics
- 2017 External Fellowship Supplemental Award  
University of Iowa, Carver College of Medicine
- 2016 Member, ProQuest Hall of Scholars
- 2015 Distinguished Thesis Award, Biological/Life Science  
Midwestern Association of Graduate Schools
- 2015 L.B. Sims Outstanding Master's Thesis Award in Biological Sciences  
Graduate College, University of Iowa
- 2015 Richard G. Lynch, MD Award for Pathology, Medical Student Research Day  
Carver College of Medicine, University of Iowa
- 2015 AAAS/Science Program for Excellence in Science Nominee
- 2014 Richard G. Lynch, MD Award for Pathology, Medical Student Research Day  
Carver College of Medicine, University of Iowa
- 2013 Research Poster Award Winner, Holden Comprehensive Center Annual Retreat  
University of Iowa Hospitals and Clinics



- 2012 Departmental Scholarly Achievement Award  
College of Human Sciences, Iowa State University
- 2011 Louise Rosenfeld Undergraduate Research Internship  
College of Human Sciences, Iowa State University

### **Academic Awards**

- 2019 Alpha Omega Alpha Honor Medical Society Induction  
Carver College of Medicine, University of Iowa
- 2018 Hancher-Finkbine Medallion for Leadership, Learning and Loyalty  
University of Iowa
- 2012 Graduated Summa Cum Laude  
Iowa State University
- 2012 University Graduation Marshall  
Iowa State University
- 2012 Graduation Ceremony Student Address  
College of Human Sciences, Iowa State University
- 2011 Cardinal Key Honor Society Induction
- 2010 Kappa Omicron Nu Academic Honor Society Induction  
Served as President (2011) and Treasurer (2010)

### **Other Awards**

- 2018 Wilderness Medicine Race Winner  
Carver College of Medicine, University of Iowa
- 2017 Wilderness Medicine Race Winner  
Carver College of Medicine, University of Iowa
- 2017 Health Science Research Week Cover Art Winner  
Carver College of Medicine, University of Iowa
- 2014 Second Place, Research Challenge Essay Contest  
Carver College of Medicine, University of Iowa
- 2005 Eagle Scout Award

## **Military Experience**

---

### **Sergeant, Infantry**

May 2007 – May 2013

United States Marine Corps

- Served in Operation Iraqi Freedom II
- Served as Platoon Sergeant, Squad Leader, Fire Team leader

September 2007 – Sept 2008

#### **Promotions:**

- 2007 Private First Class (PFC)
- 2008 Lance Corporal
- 2011 Corporal
- 2012 Sergeant

#### **Training:**

- 2011 Operation Javelin Thrust, Bridgeport, CA
- 2011 Mountain Warfare Training Center, Bridgeport, CA
- 2007 Mojave Viper, 29 Palms, CA
- 2007 School of Infantry, Camp Pendleton, CA
- 2007 Marine Corp Recruit Training, San Diego, CA

