

DAYNE LEWIS FILER

EDUCATION

UNC School of Medicine, Chapel Hill, NC

Doctor of Medicine 2022
Doctor of Philosophy, Bioinformatics & Computational Biology 2020

The College of Idaho, Caldwell, ID

B.S. Mathematics, Human Biology and Political Economy Minors (*summa cum laude*) 2012

EXPERIENCE

Duke University Hospital, Durham, NC

Resident Physician, Department of Obstetrics & Gynecology 2022 –

Renaissance Computing Institute, Chapel Hill, NC

Adjunct Research Scientist 2022 –

UNC School of Medicine, Chapel Hill, NC

Graduate Research Assistant, Wilhelmsen Laboratory 2017 – 2020
Graduate Rotation Student, Wilhelmsen Laboratory 2016
Graduate Rotation Student, Juliano Laboratory 2016

US EPA National Center for Computational Toxicology, Research Triangle Park, NC

ORISE Research Fellow, Reif & Judson Laboratories 2012 – 2016

Mount Desert Island Biological Laboratory, Salisbury Cove, ME

REU Summer Fellow, Boyer Laboratory 2011

The College of Idaho, Caldwell, ID

Undergraduate Research Assistant, Heggland Laboratory 2009 – 2012
Mountain State Tumor Medical Research Institute Summer Fellow, Heggland Laboratory 2010
Idaho INBRE Summer Research Summer Fellow, Heggland Laboratory 2009

HONORS AND AWARDS

▪ Eugene S. Mayer Honor Society for Community Service 2018

■ Bioinformatics and Computational Biology Fellowship Award	2018
■ Outstanding INBRE Student	2012
■ Best Graduate/Undergraduate Oral Presentation, 54 th Idaho Academy of Science Meeting	2012
■ Nel Tobias Travel Award	2011
■ Second-Year Calculus Student of the Year	2009
■ College of Idaho Heritage Scholarship	2008 – 2012
■ College of Idaho Dean's List	2008 – 2012

COMPLETE WORKS

PUBLICATIONS

1. DM Bost, C Bizon, JL Tilson, DL Filer, IR Gizer, and KC Wilhelmsen (2022). Association of Predicted Expression and Multimodel Association Analysis of Substance Abuse Traits. *Complex Psychiatry*.
2. DL Filer, K Hoffman, RM Sargis, L Trasande, and CD Kassotis (May 2022). On the Utility of ToxCast-Based Predictive Models to Evaluate Potential Metabolic Disruption by Environmental Chemicals. *Environ Health Perspect* 130(5): 57005. PMID: 35533074.
3. DL Filer, PA Mieczkowski, A Brandt, KL Gilmore, BC Powell, JS Berg, KC Wilhelmsen, and NL Vora (May 2022). Noninvasive prenatal exome sequencing diagnostic utility limited by sequencing depth and fetal fraction. *Prenat Diagn* 42(5): 567–573. PMID: 34265090.
4. CD Jeffries, JR Ford, JL Tilson, DO Perkins, DM Bost, DL Filer, and KC Wilhelmsen (Mar. 2022). A greedy regression algorithm with coarse weights offers novel advantages. *Sci Rep* 12(1): 5440. PMID: 35361850.
5. DL Filer, F Kuo, AT Brandt, CR Tilley, PA Mieczkowski, JS Berg, K Robasky, Y Li, C Bizon, JL Tilson, BC Powell, DM Bost, CD Jeffries, and KC Wilhelmsen (July 2021). Pre-capture multiplexing provides additional power to detect copy number variation in exome sequencing. *BMC Bioinformatics* 22(1): 374. PMID: 34284719.
6. E Aliverti, JL Tilson, DL Filer, B Babcock, A Colaneri, J Ocasio, TR Gershon, KC Wilhelmsen, and DB Dunson (June 2020). Projected t-SNE for batch correction. *Bioinformatics* 36(11): 3522–3527. PMID: 32176244.
7. AP Morgan, NF Brazeau, B Ngasala, LE Mhamilawa, M Denton, M Msellem, U Morris, DL Filer, O Aydemir, JA Bailey, JB Parr, A Mårtensson, A Bjorkman, and JJ Juliano (Jan. 2020). Falciparum malaria from coastal Tanzania and Zanzibar remains highly connected despite effective control efforts on the archipelago. *Malar J* 19(1): 47. PMID: 31992305.
8. DL Filer, P Kothiya, RW Setzer, RS Judson, and MT Martin (Feb. 2017). tcpl: the ToxCast pipeline for high-throughput screening data. *Bioinformatics* 33(4): 618–620. PMID: 27797781.
9. AL Karmaus, TD Trautman, M Krishan, DL Filer, and LA Fix (May 2017). Curation of food-relevant chemicals in ToxCast. *Food Chem Toxicol* 103: 174–182. PMID: 28285935.
10. S Auerbach, DL Filer, D Reif, V Walker, AC Holloway, J Schlezinger, S Srinivasan, D Svoboda, R Judson, JR Bucher, and KA Thayer (Mar. 2016). Prioritizing Environmental Chemicals for Obesity and Diabetes Outcomes Research: A Screening Approach Using ToxCast High Throughput Data. *Environ Health Perspect*. PMID: 26978842.
11. R Judson et al. (Oct. 2016). Analysis of the Effects of Cell Stress and Cytotoxicity on In Vitro Assay Activity Across a Diverse Chemical and Assay Space. *Toxicol Sci* 153(2): 409. PMID: 27605417.

12. AL Karmaus, DL Filer, MT Martin, and KA Houck (June 2016). Evaluation of food-relevant chemicals in the ToxCast high-throughput screening program. *Food Chem Toxicol* 92: 188–196. PMID: 27103583.
13. AL Karmaus, CM Toole, DL Filer, KC Lewis, and MT Martin (Jan. 2016). High-Throughput Screening of Chemical Effects on Steroidogenesis Using H295R Human Adrenocortical Carcinoma Cells. *Toxicol Sci*. PMID: 26781511.
14. RS Judson, FM Magpantay, V Chickarmane, C Haskell, N Tania, J Taylor, M Xia, R Huang, DM Rotroff, DL Filer, KA Houck, MT Martin, N Sipes, AM Richard, K Mansouri, RW Setzer, TB Knudsen, KM Crofton, and RS Thomas (Nov. 2015). Integrated Model of Chemical Perturbations of a Biological Pathway Using 18 In Vitro High-Throughput Screening Assays for the Estrogen Receptor. *Toxicol Sci* 148(1): 137–154. PMID: 26781511.
15. DL Filer, HB Patisaul, T Schug, DM Reif, and KA Thayer (Dec. 2014). Test driving ToxCast: endocrine profiling for 1858 chemicals included in phase II. *Current Opinion in Pharmacology* 19: 145–152. PMID: 25460227.
16. DM Rotroff, MT Martin, DJ Dix, DL Filer, KA Houck, TB Knudsen, NS Sipes, DM Reif, M Xia, and RS Judson (Aug. 2014). Predictive endocrine testing in the 21st century using *in vitro* assays of estrogen receptor signaling responses. *Environmental Science and Technology* 48(15): 8706–8716. PMID: 24960280.
17. KB Paul, JM Hedge, C Macherla, DL Filer, E Burgess, SO Simmons, KM Crofton, and MW Hornung (Oct. 2013). Cross-species analysis of thyroperoxidase inhibition by xenobiotics demonstrates conservation of response between pig and rat. *Toxicology* 312: 97–107. PMID: 23959146.

CONFERENCE ABSTRACTS

1. DL Filer (2022). Non-invasive fetal genotyping from deep sequencing of maternal plasma: Proof of concept study. Oral Presentation. 26th International Conference on Prenatal Diagnosis and Therapy.
2. DL Filer, KC Wilhelmsen, BC Powell, KL Gilmore, CM Powell, JS Berg, and NL Vora (2020). Novel sequencing-based framework for non-invasive fetal genotyping. Poster Presentation. 40th SMFM Annual Meeting-The Pregnancy Meeting, Dallas, TX.
3. DL Filer, KL Gilmore, BC Powell, PA Mieczkowski, KC Wilhelmsen, and NL Vora (2019). Exome sequencing of cell-free fetal DNA for detection of pathogenic variants: a pilot study. Poster Presentation. 69th Annual Meeting of the American Society of Human Genetics, Houston, TX.
4. DL Filer, F Kuo, C Bizon, K Robasky, JS Berg, JL Tilson, JP Evans, and KC Wilhelmsen (2018). Whole exome sequencing for exon-level copy-number variation in small-sample clinical settings. Poster Presentation. 68th Annual Meeting of the American Society of Human Genetics, San Diego, CA.
5. K Connors, DL Filer, NS Sipes, RS Judson, KA Houck, and MT Martin (2015). High-Content Screening of ToxCast Compounds Using Vala Sciences' Complex Cell Culturing Systems. Poster Presentation. The Society of Toxicology 54th Annual Meeting, San Diego, CA.
6. DL Filer, KA Houck, MT Martin, and RS Judson (2015). Making Sense of the New ToxCast Data: A Case Study with PPAR γ . Poster Presentation. The Society of Toxicology 54th Annual Meeting, San Diego, CA.
7. AL Karmaus, DL Filer, CM Toole, KC Lewis, and MT Martin (2015). Screening Chemical Effects on Steroidogenesis in H295R Human Adrenocortical Carcinoma Cells. Poster Presentation. The Society of Toxicology 54th Annual Meeting, San Diego, CA.
8. NC Kleinstreuer, Q Zang, DL Filer, MT Martin, KA Houck, D Allen, W Casey, and RS Judson (2015). Using ToxCast/Tox21 Assays and QSAR Modeling to Predict Androgen Receptor Pathway Activity. Poster Presentation. The Society of Toxicology 54th Annual Meeting, San Diego, CA.

9. DL Filer (Sept. 2014). ToxCast Data Analysis Workflow. Oral Presentation. US EPA's Chemical Safety Research: Second ToxCast Data Summit.
10. DL Filer, RS Judson, DM Rotroff, DM Reif, AM Richard, KA Houck, and MT Martin (2014). Protein-fragment complementation assays detect and describe nuclear receptor activity across the ToxCast chemical library. Poster Presentation. The Society of Toxicology 53rd Annual Meeting, Phoenix, AZ.
11. RS Judson et al. (2014). *In vitro* screening of 1877 industrial and consumer chemicals, pesticides, and pharmaceuticals in up to 782 assays: ToxCast Phase I and II. Poster Presentation. The Society of Toxicology 53rd Annual Meeting, Phoenix, AZ.
12. PG Kothiya, DM Reif, RS Judson, DL Filer, AM Richard, and MT Martin (2014). ToxCast workflow: big data processing and analysis of high-throughput screening assays for environmental chemicals. Poster Presentation. The Society of Toxicology 53rd Annual Meeting, Phoenix, AZ.
13. MT Martin, AL Forgacs, DL Filer, and C Toole (2014). Effects of ToxCast Phase I chemicals on steroidogenesis in H295R human adrenocortical carcinoma cells. Poster Presentation. The Society of Toxicology 53rd Annual Meeting, Phoenix, AZ.
14. KB Paul, DL Filer, RS Judson, VS Wilson, KM Crofton, SO Simmons, and MT Martin (2014). Adaptation of T47D-KBluc and MDA-kb2 to screening and comparison to other receptor reporter platforms. Poster Presentation. The Society of Toxicology 53rd Annual Meeting, Phoenix, AZ.
15. A Wang, JA Franzosa, I Shah, DL Filer, NC Kleinstreuer, S Marinakos, and KA Houck (2014). Comparing bioactivity profiles of diverse nano materials based on high-throughput screening (HTS) in ToxCast. Poster Presentation. The Society of Toxicology 53rd Annual Meeting, Phoenix, AZ.
16. DL Filer, A Wilson, MT Martin, KA Houck, DM Reif, and RS Judson (2013). Multiplexed gene expression data: cell stress induced promiscuity. Poster Presentation. The Society of Toxicology 52nd Annual Meeting, San Antonio, TX.
17. DL Filer (2012). Cadmium disrupts the extracellular matrix secreted by human osteosarcoma Soas-2 cells. Oral Presentation. 54th Idaho Academy of Science Annual Meeting, Idaho Falls, ID.
18. DL Filer (2012). Cadmium disrupts the extracellular matrix secreted by human osteosarcoma Soas-2 cells. Oral Presentation. 7th Annual College of Idaho Student Research Conference, Caldwell, ID.
19. SW Wright, DL Filer, KB Quinney, and SJ Heggland (2012). Cadmium disrupts the extracellular matrix secreted by human osteosarcoma Saos-2 cells. Poster Presentation. The Society of Toxicology 51st Annual Meeting, San Francisco, CA.
20. DL Filer (2011). Circulation of bilirubin in adult sea lamprey. Oral Presentation. MDIBL/INBRE Summer Student Symposium, Salisbury Cove, ME.
21. DL Filer, SY Cai, and JL Boyer (2011). Functional characterization of ASBT-like transporter in the intestine of sculpin, *Myoxocephalus octodecemspinosus*. Poster Presentation. 20th Regional Murdock Conference on Undergraduate Research, Seattle, WA.
22. MA Simmonds, CM Christensen, DL Filer, DE Haggard, KS Arbon, and SJ Heggland (2011). Cadmium exposure alters the expression of key regulatory genes in osteoblastic cells via activation of the ERK signaling pathway. Poster Presentation. The Society of Toxicology 50th Annual Meeting, Washington, DC.
23. DL Filer, DE Haggard, and SJ Heggland (2010). Cadmium alters mineralization in Saos-2 osteoblastic cells. Poster Presentation. 19th Regional Murdock Conference on Undergraduate Research, McMinnville, OR.

24. DL Filer, DE Haggard, and SJ Heggland (2010). Investigating a potential protective role of 17β estradiol against cadmium-induced toxicity in mineralizing osteoblastic cells. Poster Presentation. 9th Annual INBRE Research Conference, Moscow, ID.
25. DL Filer, JR Weese, MC Eide, and E Yensen (2010). Do soils affect invasion by Bur Buttercup (*Rununculus testiculatus*) in the Snake River Birds of Prey Area, Southwestern Idaho? Poster Presentation. 5th Annual College of Idaho Student Research Conference, Caldwell, ID.
26. KS Arbon, DL Filer, and SJ Heggland (2009). 17β Estradiol protects cadmium-induced oxidative stress in human osteoblast-like cell line, Saos-2. Poster Presentation. The Endocrine Society 91st Annual Meeting, Washington, DC.
27. DL Filer, KS Arbon, WA Harvey, and SJ Heggland (2009). The effect of 17β estradiol and its metabolites on cadmium-induced oxidative stress. Poster Presentation. 18th Regional Murdock Conference on Undergraduate Research, Spokane, WA.
28. DL Filer, KS Arbon, WA Harvey, and SJ Heggland (2009). The effect of 17β estradiol and its metabolites on cadmium-induced oxidative stress. Poster Presentation. 8th Annual INBRE Research Conference, Pocatello, ID.

SOFTWARE

1. *bcTSNE: Projected t-SNE for Batch Correction*. R Package.
<https://cran.r-project.org/web/packages/bcTSNE/index.html>.
2. *htlcr: How to Learn to Code R*. R Package. <https://github.com/How-to-Learn-to-Code/rclass>.
3. *mcCNV: CNV detection for multiplexed capture exome sequencing*. R Package.
<https://github.com/daynefiler/mcCNV>.
4. *tcpl: ToxCast Data Analysis Pipeline*. R Package.
<https://cran.r-project.org/web/packages/tcpl/index.html>.
5. *toxpiR: R package for the Toxicological Priority Index (ToxPi) algorithm*. R Package.
<https://cran.r-project.org/web/packages/toxpiR/index.html>.

FUNDING

- | | | | | |
|----|--|-----------|--|-------------------|
| 1. | 550KR231934 | PI: Vora | North Carolina Translational and Clinical Sciences Institute | |
| | Expanding the utility of non-invasive prenatal genetic testing | | | 05/2020 – 05/2021 |
| | Role: Investigator | | | \$50,000 |
| | | | | |
| 2. | F30HD101228 | PI: Filer | National Institute of Child Health & Human Development | |
| | Expanding the utility of prenatal genetic testing | | | 11/2019 – 10/2023 |
| | Role: Principal Investigator | | | \$179,260 |
| | | | | |
| 3. | Pilot Grant | PI: Filer | Illumina, Inc. & UNC High Throughput Sequencing Facility | |
| | Expanding the utility of non-invasive prenatal genetic testing | | | 05/2019 – 05/2021 |
| | Role: Principal Investigator | | | \$6,687 |

TEACHING

1. Practical R for Scientists	UNC School of Medicine	<i>Spring 2020</i>
2. How to Learn to Code	UNC School of Medicine	<i>Summers 2016, 2018, 2019</i>
3. BCB720, Intro to Statistical Modeling (TA)	UNC School of Medicine	<i>Fall 2018</i>
4. MAT123, Applied Mathematics (TA)	College of Idaho	<i>Spring 2012</i>
5. MAT152, Calculus II (TA)	College of Idaho	<i>Fall 2011</i>
6. BIO330, Cell Biology (TA)	College of Idaho	<i>Fall 2011</i>
7. BIO220, Freshman Biology II (TA)	College of Idaho	<i>Spring 2011</i>
8. MAT151, Calculus I (TA)	College of Idaho	<i>Fall 2010, Spring 2011</i>
9. BIO120, Freshman Biology I (TA)	College of Idaho	<i>Fall 2010</i>

PROFESSIONAL SERVICE

▪ Board of Directors for Come to the Table, Inc.	<i>2018 – 2019</i>
▪ Emergency Department Volunteer, UNC Hospital, Chapel Hill, NC	<i>2013 – 2014</i>
▪ Member, NIEHS 2013 Career Fair Planning Committee	<i>2012 – 2013</i>
▪ Citizen Teacher, Citizen Schools, Durham, NC	<i>2012</i>
▪ Member, College Budget Committee	<i>2010 – 2012</i>
▪ Member, Student Research Committee	<i>2010 – 2012</i>
▪ Member, Tenure Track Math Faculty Search Committee	<i>2010 – 2011</i>