

# Gage Rowden, M.S.

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## Education

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**Texas Tech University**, B.S. in Biology

Sep 2011–May 2016

**Texas Tech University**, M.S. in Biotechnology

Sep 2016–May 2018

## Experience

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**Lead Technical R&D Scientist**, Priogen Corporation — St. Paul, MN

Jan 2024–present

- Established a Django framework database for storing and reporting client data.
- Designed and optimized data analysis workflows to efficiently process high-throughput datasets.
- Contributed to multiple projects which lead to the development of intellectual property.
- Established and implemented standard operating procedures to enhance consistency and quality.
- Integrated version control across all projects, ensuring reproducibility and streamlined collaboration.
- Designed and outfitted the diagnostic laboratory, optimizing it for high-performance testing and analysis.

**Researcher IV**, MNPRO, University of Minnesota — St. Paul, MN

Aug 2022–present

- Co-authored 17 manuscripts, including two first-author publications.
- Developed a custom R package and automation scripts to optimize data analysis and processing.
- Led the expansion of laboratory space, improving research capacity and workflow efficiency.
- Designed and implemented a robust accession system for managing large laboratory inventory.
- Provided expert consultation on RT-QulC and related diagnostic tests for research collaborators.
- Aided in field collection of prion-infected samples, ensuring proper handling and documentation.

**Researcher III**, MNPRO, University of Minnesota — St. Paul, MN

Aug 2019–Nov 2021

- Oversaw and consulted on the development of the BSL-2 laboratory, ensuring compliance and functionality.
- Developed and refined RT-QulC techniques for prion disease diagnostics.
- Contributed to multiple published projects, supporting prion research and diagnostics.
- Advised research labs on RT-QulC implementation, facilitating technology adoption in external institutions.
- Received advanced NIH training to expand in-house RT-QulC capabilities.
- Established multiple prion clones, including a proprietary clone for diagnostic applications.

**Lab Technician III**, Dept. of Cell Bio & Biochem, TTUHSC — Lubbock, TX

Aug 2018–Aug 2019

- Investigated the role of nonsense-mediated RNA decay in male gametes.
- Developed an improved sperm head isolation method for forensic applications in rape kit analysis.
- Managed laboratory operations, including maintenance, purchasing, and project coordination.
- Collaborated with department researchers to support diverse biochemical investigations.

**Graduate Research Assistant**, Dept. of Chemistry, TTU — Lubbock, TX

Jun 2017–May 2018

- Researched cocaine biosynthetic pathways in coca plants, aiming to elucidate key biochemical mechanisms.
- Collaborated with faculty and graduate researchers to drive multiple research initiatives.
- Developed expertise in molecular biology and biochemical techniques, refining analytical skills.
- Presented research findings at conferences, enhancing scientific communication skills.

**Graduate Teaching Assistant**, Dept. of Biological Sciences, TTU — Lubbock, TX

Aug 2017–Dec 2017

- Maintained microbial cultures (eukaryotic and prokaryotic) for laboratory experiments.
- Led weekly lectures for 33 students, providing structured instruction and guidance.

- Emphasized the importance and ubiquity of microbes in scientific and medical contexts.
- Designed and implemented microbial isolation and identification techniques.

**Graduate Teaching Assistant**, Dept. of Chemistry, TTU — Lubbock, TX

Jan 2017–May 2018

- Instructed weekly 3-hour general chemistry lab sessions, reinforcing fundamental concepts.
- Managed and educated approximately 140 students, ensuring comprehension of core chemistry techniques.
- Developed strong teaching and communication skills, explaining abstract concepts effectively.

## First Author Publications

<b>quickR: An R Library for Streamlined Data Handling of Real-Time Quaking Induced Conversion Assays</b> <i>Gage R Rowden</i> , Peter A Larsen. <a href="https://ssrn.com/abstract=5188757">10.2139/ssrn.5188757</a>	2025
<b>Standardization of data analysis for RT-QulC-based detection of chronic wasting disease</b> <i>Gage R Rowden</i> , Catalina Picasso-Risso, Manc Li, Marc D Schwabenlander, Tiffany M Wolf, Peter A Larsen. <a href="https://doi.org/10.3390/pathogens12020309">10.3390/pathogens12020309</a>	2023

## Publications

<b>RT-QulC optimization for prion detection in soils</b> Madeline K Grunklee, Stuart S Lichtenberg, <i>Gage R Rowden</i> , Diana L Karwan, E Anu Li, Marc D Schwabenlander, Tiffany M Wolf. <a href="https://doi.org/10.1016/j.mex.2025.103380">10.1016/j.mex.2025.103380</a>	2025
<b>Prion Partitioning and Persistence in Environmental Waters</b> E. Anu Li, Diana L Karwan, Stuart Siegfried Lichtenberg, <i>Gage R Rowden</i> , Marc D Schwabenlander, Peter A Larsen, Tiffany M Wolf. <a href="https://doi.org/10.1021/acs.est.4c11497">10.1021/acs.est.4c11497</a>	2025
<b>Chronic wasting disease prions on deer feeders and wildlife visitation to deer feeding areas</b> Miranda HJ Huang, Steve Demarais, Marc D Schwabenlander, Bronson K Strickland, Kurt C VerCauteren, William T McKinley, <i>Gage R Rowden</i> , Corina C Valencia Tibbitts, Sarah C Gresch, Stuart S Lichtenberg, Tiffany M Wolf, Peter A Larsen. <a href="https://doi.org/10.1002/jwmg.70000">10.1002/jwmg.70000</a>	2025
<b>Inter-laboratory comparison of real-time quaking-induced conversion (RT-QulC) for the detection of chronic wasting disease prions in white-tailed deer retropharyngeal lymph nodes</b> Joseph R Darish, Alyssa W Kaganer, Brenda J Hanley, Krysten L Schuler, Marc D Schwabenlander, Tiffany M Wolf, Md Sohel Ahmed, <i>Gage R Rowden</i> , Peter A Larsen, Estela Kobashigawa, Deepanker Tewari, Stuart Lichtenberg, Joel A Pedersen, Shuping Zhang, Srinand Sreevatsan. <a href="https://doi.org/10.1177/10406387241285165">10.1177/10406387241285165</a>	2025
<b>Prion forensics: a multidisciplinary approach to investigate CWD at an illegal deer carcass disposal site</b> Marc D Schwabenlander, Jason C Bartz, Michelle Carstensen, Alberto Fameli, Linda Glaser, Roxanne J Larsen, Manc Li, Rachel L Shoemaker, <i>Gage R Rowden</i> , Suzanne Stone, W David Walter, Tiffany M Wolf, Peter A Larsen. <a href="https://doi.org/10.1080/19336896.2024.2343298">10.1080/19336896.2024.2343298</a>	2024
<b>Detection and decontamination of chronic wasting disease prions during venison processing</b> Marissa Milstein, Sarah C Gresch, Marc D Schwabenlander, Manc Li, Jason C Bartz, Damani N Bryant, Peter R Christenson, Laramie L Lindsey, Nicole Lurndahl, Sang-Hyun Oh, <i>Gage R Rowden</i> , Rachel L Shoemaker, Tiffany M Wolf, Peter A Larsen, Stuart S Lichtenberg. <a href="https://doi.org/10.1101/2024.07.23.604851">10.1101/2024.07.23.604851</a>	2024
<b>Rapid on-site amplification and visual detection of misfolded proteins via microfluidic quaking-induced conversion (Micro-QulC)</b> Dong Jun Lee, Peter R Christenson, <i>Gage R Rowden</i> , Nathan C Lindquist, Peter A Larsen, Sang-Hyun Oh. <a href="https://doi.org/10.1038/s44328-024-00006-x">10.1038/s44328-024-00006-x</a>	2024
<b>Visual detection of misfolded alpha-synuclein and prions via capillary-based quaking-induced conversion assay (Cap-QulC)</b> Peter R Christenson, Hyeonjeong Jeong, Hyerim Ahn, Manc Li, <i>Gage R Rowden</i> , Rachel L Shoemaker, Peter A Larsen, Hye Yoon Park, Sang-Hyun Oh. <a href="https://doi.org/10.1038/s44328-024-00003-0">10.1038/s44328-024-00003-0</a>	2024
<b>Microfluidic Quaking-Induced Conversion (Micro-QulC) for Rapid On-Site Amplification and Detection of Misfolded Proteins</b>	2023

Dong Jun Lee, Peter R Christenson, **Gage R Rowden**, Nathan C Lindquist, Peter A Larsen, Sang-Hyun Oh. [10.1101/2023.07.17.549283](https://doi.org/10.1101/2023.07.17.549283)

- Nanoparticle-enhanced RT-QulC (nano-QulC) diagnostic assay for misfolded proteins** 2023  
Peter R Christenson, Manc Li, **Gage R Rowden**, Peter A Larsen, Sang-Hyun Oh. [10.1021/acs.nanolett.3c01001](https://doi.org/10.1021/acs.nanolett.3c01001)
- Assessment of Real-Time Quaking-Induced Conversion (RT-QulC) Assay, Immunohistochemistry and ELISA for Detection of Chronic Wasting Disease under Field Conditions in White-Tailed Deer: A Bayesian Approach** 2022  
Catalina Picasso-Risso, Marc D Schwabenlander, **Gage R Rowden**, Michelle Carstensen, Jason C Bartz, Peter A Larsen, Tiffany M Wolf. [10.3390/pathogens11050489](https://doi.org/10.3390/pathogens11050489)
- A field-deployable diagnostic assay for the visual detection of misfolded prions** 2022  
Peter R Christenson, Manc Li, **Gage R Rowden**, Marc D Schwabenlander, Tiffany M Wolf, Sang-Hyun Oh, Peter A Larsen. [10.1038/s41598-022-16323-y](https://doi.org/10.1038/s41598-022-16323-y)
- Sensitive detection of chronic wasting disease prions recovered from environmentally relevant surfaces** 2022  
Qi Yuan, **Gage R Rowden**, Tiffany M Wolf, Marc D Schwabenlander, Peter A Larsen, Shannon L Bartelt-Hunt, Jason C Bartz. [10.1016/j.envint.2022.107347](https://doi.org/10.1016/j.envint.2022.107347)
- Elucidation of tropane alkaloid biosynthesis in Erythroxylum coca using a microbial pathway discovery platform** 2022  
Benjamin G Chavez, Prashanth Srinivasan, Kayla Glockzin, Neill Kim, Olga Montero Estrada, Jan Jirschitzka, **Gage R Rowden**, Jonathan Shao, Lyndel Meinhardt, Christina D Smolke, John C D'auria. [10.1073/pnas.221537211](https://doi.org/10.1073/pnas.221537211)
- Comparison of chronic wasting disease detection methods and procedures: implications for free-ranging white-tailed deer (Odocoileus virginianus) surveillance and management** 2022  
Marc D Schwabenlander, **Gage R Rowden**, Manc Li, Kelsie LaSharr, Erik C Hildebrand, Suzanne Stone, Davis M Seelig, Chris S Jennelle, Louis Cornicelli, Tiffany M Wolf, Michelle Carstensen, Peter A Larsen. [10.7589/JWD-D-21-00033](https://doi.org/10.7589/JWD-D-21-00033)
- RT-QulC detection of CWD prion seeding activity in white-tailed deer muscle tissues** 2021  
Manc Li, Marc D Schwabenlander, **Gage R Rowden**, Jeremy M Schefers, Christopher S Jennelle, Michelle Carstensen, Davis Seelig, Peter A Larsen. [10.1038/s41598-021-96127-8](https://doi.org/10.1038/s41598-021-96127-8)
- Morphometric and genetic variation in 8 breeds of Ethiopian camels (Camelus dromedarius)** 2018  
Yoseph W Legesse, Christopher D Dunn, Matthew R Mauldin, Nicté Ordonez-Garza, **Gage R Rowden**, Yoseph Mekasha Gebre, Mohammed Y Kurtu, Seid Mohammed Ali, Wondmagegne D Whibesilassie, Michael Ballou, Melaku Tefera, Gad Perry, Robert D Bradley. [10.1093/jas/sky351](https://doi.org/10.1093/jas/sky351)

## Patents

- Methods and materials for detecting misfolded polypeptides** Filed: April 15, 2022  
Peter C Christenson, **Gage R Rowden**, Sang-Hyun Oh, Peter A Larsen, Manc Li Issued: in review  
*U.S. Patent 18,286,682*

## Software

- quicR: An R Library for Streamlined Data Handling of Real-Time Quaking Induced Conversion Assays** [github.com/gage1145/quicR](https://github.com/gage1145/quicR)
- Developed an R package for the extraction, manipulation, and analysis of RT-QulC data.
  - Tools Used: R

## Presentations

- Introduction to R** 2025  
**Gage R Rowden**. MNPRO Lab Forum, Saint Paul, MN
- Introduction to quicR** 2025  
**Gage R Rowden**. MNPRO Lab Forum, Saint Paul, MN

<b>Introduction to Git &amp; Github</b> <i>Gage R Rowden</i> . MNPRO Lab Forum, Saint Paul, MN	2024
<b>Increased Sensitivity of RT-QulC Using Micro-filtration</b> <i>Gage R Rowden</i> , Mancı Li, Marc D Schwabenlander, Peter A Larsen. Chronic Wasting Disease Conference, Denver, CO	2023
<b>Standardization of Data Analysis for RT-QulC-based Detection of Chronic Wasting Disease</b> <i>Gage R Rowden</i> , Catalina Picasso-Risso, Mancı Li, Marc D Schwabenlander, Tiffany Wolf, Peter A Larsen. Prion, Göttingen, Germany	2022
<b>Standardization of Data Analysis for RT-QulC-based Detection of Chronic Wasting Disease</b> <i>Gage R Rowden</i> , Catalina Picasso-Risso, Mancı Li, Marc D Schwabenlander, Tiffany Wolf, Peter A Larsen. Wildlife Disease Association Conference, Madison, WI	2022
<b>RT-QulC as a Diagnostic Tool</b> <i>Gage R Rowden</i> . Saint Paul, MN	2020
<b>Finding the Oxidases Involved in the First Ring Closure of Tropane &amp; Granatane Biosynthesis</b> <i>Gage R Rowden</i> , John C D'Auria. Thesis Defense, Lubbock, TX	2018
<b>Finding the Oxidases Involved in the First Ring Closure of Tropane &amp; Granatane Biosynthesis</b> <i>Gage R Rowden</i> , John C D'Auria. Biotechnology Research Symposium, Lubbock, TX	2017
<b>Red/Green Colorblindness</b> <i>Gage R Rowden</i> . Biotechnology Research Symposium, Lubbock, TX	2016
<b>Functional Amyloids: A Link Between Yeast Reproduction and Mammalian Fertilization</b> <i>Gage R Rowden</i> , Gail A Cornwall. Texas Tech Association of Biologists Symposium, Lubbock, TX	2015

## Skills

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### Computational Skills

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|-------------------------|-----------------------------------|------------------|
| • R & Tidyverse         | • Shiny                           | • GitHub Actions |
| • R package development | • Python                          | • Bioinformatics |
| • Data visualization    | • L <sup>A</sup> T <sub>E</sub> X |                  |
| • Quarto                | • Git & GitHub                    |                  |

### Molecular Biology & Biochemistry

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|-----------------------------------|-------------------------|-------------------------|
| • Recombinant DNA technology      | • Western blotting      | • Cell line maintenance |
| • DNA cloning                     | • Liquid chromatography | • Bacterial culturing   |
| • DNA sequencing                  | • Gas chromatography    | • Biosafety Level 2     |
| • PCR techniques                  | • Mass spectrometry     | • Biosafety Level 3     |
| • Protein expression/purification | • RT-QulC               |                         |
| • Protein characterization        | • Prion research        |                         |

### Additional Skills

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|-----------------------------------|-------------------|------------|
| • Scientific writing & publishing | • Research ethics | • Teaching |
| • Project management              | • Public speaking |            |