

EDUCATION

Doctorate, Medical Physics January 2013 - present
 University of Manitoba
 Thesis: *Inferring axon diameter sizes using oscillating gradient spin echo sequences*
 Supervisor: Dr. Melanie Martin

Masters of Science, Medical Physics February, 2013
 University of Manitoba
 Thesis: *Magnetic Resonance Imaging and Magnetic Resonance Spectroscopy
 Characterize a Rodent Model of Covert Stroke*
 Supervisors: Drs. Melanie Martin and Chris Bidinosti

Bachelor of Science (Honours), Physics June, 2007
 University of Winnipeg
 Thesis: *Somatosensory Evoked Potentials in Mice*
 Supervisor: Dr. Melanie Martin

Bachelor of Arts, Mathematics June, 2006
 University of Winnipeg

EXPERIENCE

RESEARCH ASSISTANT September, 2009 - present
 University of Winnipeg

- MR imaging of rodent models: acquisition of data using Paravision 5.0 software, analysis of data using MatLab and Amira, statistical analysis using SAS 9.3. Supervise undergraduate students.

STUDENT MARKER September, 2004 - present
 University of Winnipeg

- Marked assignments for introductory, intermediate and advanced courses in Physics.
- Courses: Foundations of Physics I, Thermodynamics (I & II), Classical Mechanics (I & II), Quantum Mechanics (I & II), Medical Imaging.

TEACHING ASSISTANT / LAB DEMO September, 2013 - present
 University of Winnipeg

- Lab demonstrator for Intermediate Physics lab; grading of assignments and lab reports.

RESEARCH INTERESTS

- Developing and applying quantitative imaging modalities such as Magnetic Resonance Imaging (MRI) to determine non-invasive methods to diagnose and treat disorders of the Central Nervous System (CNS), such as Alzheimer's disease and Schizophrenia.
- Current Research: Assessment and development of MRI imaging analysis techniques as they apply to rodent models of CNS disorders.

AREAS OF RESEARCH/Keywords

analysis software development and pulse programming, software engineering, bioinformatics, Alzheimer's disease, central nervous system inflammatory diseases, diagnostic techniques, image analysis, mouse and rat models, MRI, Multiple Sclerosis, myelin content, neuroscience, physics, Schizophrenia, segmentation, white matter.

AWARDS

McCrorie-West Family Fellowship for Alzheimer Research Student Award	September, 2016
McCrorie-West Family Fellowship for Alzheimer Research Student Award	January, 2016
ISMRM 23rd Annual Meeting & Exhibition Educational stipend	June, 2015
Faculty of Graduate Studies Student Travel Award	May 2015
ISMRM 22nd Annual Meeting & Exhibition Educational stipend	June, 2014
ISMRM Workshop on Diffusion as a Probe of Neural Tissue Microstructure Travel Award	October, 2013
Graduate Students Association Travel Award	April, 2013
ISMRM 21st Annual Meeting & Exhibition Educational Stipend	April, 2013
Faculty of Graduate Studies Student Travel Award	April 2013
Faculty of Graduate Studies Student Travel Award	June, 2011
Graduate Students Association Travel Award	June, 2011
Faculty of Graduate Studies Faculty of Science Scholarship	September, 2009 - August, 2011

Articles Published or Accepted in Refereed Journals

1. **Herrera SL**, Palmer L, Cardigan Smith B, Kim A, Schellenberg A, Thiessen JD, Buist R, Del Bigio MR, Martin M. Damage to the Optic Chiasm in Myelin Oligodendrocyte Glycoprotein - Experimental Autoimmune Encephalomyelitis Mice and Pertussis Toxin Sham Mice. *Magnetic Resonance Insights*. 2014: 7 23-31
2. Kastyak-Ibrahim MZ, Di Curzio DL, Buist R, **Herrera SL**, Feng S, Kong J, Li X-M, Albensi BC, Del Bigio MR, Martin M. Neurofibrillary tangles and plaques are not accompanied by white matter pathology in aged triple transgenic-Alzheimer disease mice. *Magnetic Resonance Imaging*. 2013 <http://dx.doi.org/10.1016/j.mri.2013.06.013>
3. Thiessen JD, Vincent TJ, **Herrera SL**, Martin. Diffusion Tensor Metric Measurements as a Function of Diffusion Time in the Rat Central Nervous System. *Magnetic Resonance Insights*. 2012:5 37-47 doi:10.4137/MRI.S10692
4. Hayes K, Buist R, Vincent TJ, Thiessen JD, Zhang Y, Zhang H, Wang J, Summers R, Kong J, Li XM, Martin M. Comparison of manual and semi-automated segmentation methods to evaluate hippocampus volume in APP and PS1 transgenic mice obtained via in vivo magnetic resonance imaging. *J Neurosci Methods*. 2014 221:103-11 doi: 10.1016/j.jneumeth.2013.09.014. (acknowledgement)

Articles Published or Accepted in Refereed Venues

1. **Herrera SL**, Mercredi ME, Vincent TJ, Buist R, Martin M. Using oscillating gradient spin-echo sequences to infer micron-sized bead and pore radii. International Society for Magnetic Resonance in Medicine (ISMRM) Annual Meeting. Toronto, Ontario. 2015: 3027
2. **Herrera SL**, Whittaker H, Zhu S, Palmer VL, Buist R, Li XM, Thiessen JD, Martin M. Comparison of relaxation magnetic transfer, and diffusion tensor measurements in the hippocampal formation between APP, PS1, and control mice. International Society for Magnetic Resonance in Medicine (ISMRM) Annual Meeting. Toronto, Ontario. 2015: 2227
3. Palmer VL, **Herrera SL**, Thiessen JD, Zhu S, Buist R, Li XM, Del Bigio MR, Martin M. Understanding the interplay different MRI methods have as white matter changes longitudinally in the cuprizone mice model. International Society for Magnetic Resonance in Medicine (ISMRM) Annual Meeting. Toronto, Ontario. 2015: 3574
4. **Herrera SL**, Vincent TJ, Mercredi ME, Buist R, Bidinosti CP, Martin M. Inferring Axon Diameter Sizes using Monte Carlo Simulations and Oscillating Gradient Spin Echo Sequences. . International Society for Magnetic Resonance in Medicine (ISMRM) Annual Meeting. Milan, Italy: 2014;2632
5. **Herrera SL**, Vincent TJ, Buist R, Bidinosti CP, Martin M. Using Oscillating Gradient Spin Echo Sequences to Probe Smaller Restriction Sizes. 2013. International Society for Magnetic Resonance in Medicine (ISMRM) Workshop on Diffusion as a Probe of Tissue Microstructure. Podstrana, Croatia.
6. **Herrera SL**, Vincent TJ, Thiessen JD, Buist R, Martin M. Distinguishing small pore sizes using oscillating gradient spin echo sequences. 2013. International Society for Magnetic Resonance in Medicine (ISMRM) Annual Meeting, Salt Lake City, Utah: 3147
7. Hewlett K, Kung D, **Herrera SL**, Thiessen J, Buist R, Peeling J, Martin M, Corbett D. Effect of chronic mild stress in rats with diet-induced CVD risk factors. Canadian Stroke Congress. 2011. (selected for oral presentation as one of the top 5 abstracts).

8. Hayes K, Buist R, Vincent T, Zhang Y, Thiessen JD, Zhang H, Kong J, Li XM, Martin M. Development of an In-Vivo Magnetic Resonance Imaging Method to Evaluate Hippocampus Volume in APP and PS1 Transgenic Mice. 2012. Alzheimer's Association International Conference, Vancouver. (Acknowledgment).

Other Contributions

1. **Herrera SL**, Mercredi ME, Buist R, Martin M. Using Oscillating gradient spin-echo sequences to infer micron-sized bead and pore radii. BiomedCon2015. Winnipeg, Manitoba 2015
2. Vancuren JL, Aliani M, **Herrera SL**, Martin M, Suh M. Effects of hempseed oil on n-3 fatty acids enriched tissue function and THC metabolites in vivo. Canadian Nutrition Society Annual Conference. Winnipeg, Manitoba. 2015
2. **Herrera SL**, Mercredi M, Buist R, Martin M. A new biomarker for Schizophrenia. Manitoba Neuroscience Network 5th Annual Meeting, Winnipeg, Manitoba. 2015
3. Mercredi M, Vincent TJ, **Herrera SL**, Buist R, Bidinosti CP, Martin M. Determination of axon diameter distributions using magnetic resonance. Manitoba Neuroscience Network 5th Annual Meeting, Winnipeg, Manitoba. 2015
4. Palmer VL, **Herrera SL**, Thiessen JD, Zhu S, Buist R, Li XM, Del Bigio MR, Martin M. Understanding white matter pathology through correlation of MRI and pathology in the cuprizone mouse. Manitoba Neuroscience Network 5th Annual Meeting, Winnipeg, Manitoba. 2015
5. Whittaker H, **Herrera SL**, Zhu S, Palmer VL, Buist R, Li XM, Thiessen JD, Martin M. Comparison of relaxation, magnetization transfer, and diffusion tensor measurements in the hippocampus of mouse models of Alzheimer's disease. Manitoba Neuroscience Network 5th Annual Meeting, Winnipeg, Manitoba. 2015
6. O'Brien-Moran Z, Palmer VL, Dale R, **Herrera SL**, Snow W, Buist R, Albeni BC, Matsuda K, Martin M. Diffusion tensor magnetic resonance imaging: pre-clinical applications in brain tumours, Alzheimer's disease and Multiple Sclerosis. Manitoba Neuroscience Network 5th Annual Meeting, Winnipeg, Manitoba. 2015
7. Martin M, Palmer VL, **Herrera SL**, Zhu S, Buist R, Del Bigio MR, Thiessen JD. Correlating quantitative MR changes with pathological changes in white matter of the cuprizone mouse model of demyelination. Canadian Association of Physicists Annual Congress. Edmonton, Alberta. 2015
8. Martin M, Buist R, Bidinosti CP, Vincent TJ, **Herrera SL**, Mercredi ME. Inferring sub-micron sizes using oscillating gradient diffusion weighted magnetic resonance imaging. Canadian Association of Physicists (CAP) Annual Congress. Sudbury, Ontario: 2014
9. Mercredi ME, Vincent TJ, Herrera SL, Buist R, Bidinosti CP, Martin M. Inferring axon diameter sizes using Monte Carlo simulations of magnetic resonance oscillating gradient spin echo sequences. Canadian Association of Physicists (CAP) Annual Congress. Sudbury, Ontario: 2014
10. **Herrera SL**, Vincent TV, Thiessen JD, Buist R, Martin. Changes in Axon Diameter Distributions as a Potential Biomarker for Alzheimer's Disease. 2013. Manitoba Neuroscience Network 4th Annual Meeting. (poster)
11. Kastyak-Ibrahim MZ, Di Curzio DL, Buist R, **Herrera SL**, Albeni BC, Del Bigio MR, Martin M. Neurofibrillary tangles and plaques are not accompanied by white matter pathology in older 3xTg-AD mice. Manitoba Neuroscience Network 4th Annual Meeting. (poster)

12. **Herrera SL**, Vincent TV, Thiessen JD, Buist R, Martin. Changes in Axon Diameter Distributions as a Potential Biomarker for Alzheimer's Disease. 2013. CSHRF Manitoba Poster Competition.
13. **Herrera SL**, Vincent TJ, Thiessen JD, Buist R, Martin. Can distinguishing small cell sizes using oscillating gradient spin echo MRI sequences help us to understand Alzheimer's Disease? 2013. Alzheimer Society of Manitoba, Spotlight on Research. (poster)
14. Martin M, **Herrera SL**, Vincent TJ, Thiessen JD, Buist R. Distinguishing small pore sizes using oscillating gradient spin echo sequences. 2013. Canadian Association of Physicists Congress.
15. Kastyak-Ibrahim MK, Di Curzo DL, Buist R, **Herrera SL**, Albensi BC, Del Bigio MR, Martin M. Region specific changes in Alzheimer's disease mouse models evaluated by volume and DTI metric values. 2013. Canadian Association of Physicists Congress.
16. **Herrera SL**, Hewlett K, Thiessen JD, Buist R, Peeling J, Corbett D, Bidinosti C, Martin M. Magnetic Resonance Imaging and Magnetic Resonance Spectroscopy Identify Abnormalities in the Development of a Rodent Model of Covert Stroke. 2012. Manitoba Neuroscience Network 3rd Annual Meeting. (poster - ranked top 6 student category)
17. Hayes K, Zhang Y, Buist R, Vincent T, Thiessen JD, **Herrera SL**, Kurjewicz L, Zhang H, Kong J, Li X, Martin M. Development of an In-Vivo MRI Method to Evaluate Hippocampus Volume and Shape in APP and PS1 Transgenic Mice. 2011. Manitoba Neuroscience Network 2nd Annual Meeting. (poster)
18. **Herrera SL**, Hewlett K, Thiessen JD, Buist R, Peeling J, Corbett D, Bidinosti C, Martin M. High resolution MRI and MRS can detect Abnormalities in a Rodent Model of Covert Stroke. 2011. Canadian Association of Physicists Congress (Best Student Presentation competition)
19. **Herrera SL**, Hewlett K, Thiessen JD, Buist R, Peeling J, Corbett D, Bidinosti C, Martin M. High resolution MRI and MRS can detect Abnormalities in a Rodent Model of Covert Stroke. 2011. CSHRF Manitoba Poster Competition.

OTHER EMPLOYMENT / VOLUNTEER

UNIVERSITY OF WINNIPEG

Admissions Assistant – *International Student Services*

May, 2007 – June, 2009

UNIVERSITY OF WINNIPEG

Office Assistant – *Student Records / Advising*

December, 2006 – May, 2007

TUTOR/MENTOR

September, 2004 – ongoing

- Volunteer tutored students and peers taking courses primarily in Mathematics, such as Calculus (Introductory & Intermediate).

OTHER SKILLS

- Computer Skills: expert of Amira, MatLab, LabView, Maple, Paravision, SAS, SPSS
- Languages: English, practical knowledge of Tagalog, French