

**Date Submitted:** 2017-04-13 07:34:43

**Confirmation Number:** 665380

**Template:** NSERC\_Researcher

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## **Dr. Steven Beyea**

Correspondence language: English

Sex: Male

## **Contact Information**

The primary information is denoted by (\*)

### **Address**

Primary Affiliation (\*)

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## Dr. Steven Beyea

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### Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	No	No	No	No

### Degrees

- 2000/10      Doctorate, Physics, University of New Brunswick  
Supervisors: Dr. Bruce Balcom, 1995/9 - 2000/5
- 1995/5      Bachelor's, Physics, University of New Brunswick  
Supervisors: Dr. Bruce Balcom, 1994/9 - 1995/4

### Recognitions

- 2015/5      Innovation in Practice Award  
Progress Media  
Honor  
Based on an external nomination, my research on new technologies for functional neuroimaging (currently being translated to GE Healthcare) was selected by a review panel as 1 of 5 awarded finalists from across Atlantic Canada for an "Innovation in Practice Award"
- 2015/5      Dr. Charles Lo Prize in Radiology Research - 1,800  
Dalhousie University  
Prize / Award  
Prize given in recognition of outstanding research contributions to medical imaging technology.
- 2012/3      Science Atlantic Hall of Fame - "Outstanding Alumni Award" - 0  
Atlantic Provinces Council on the Sciences  
Distinction  
Based on an external nomination, I was selected to become a member of the Science Atlantic Hall of Fame. "The Outstanding Alumni Award was created in 2012 for the 50th anniversary of Science Atlantic. The Award recognizes former students from Atlantic Canada who excelled at a Science Atlantic (or APICS) student conference and then went on to meaningful careers. It is one of four categories for recognition in our Science Atlantic Hall of Fame."

- 2011/4      Public Service Award of Excellence to the Neurotouch Surgical Oncology team  
National Research Council of Canada  
Distinction  
Award given in recognition of my contributions to the development of a novel virtual reality technology for neurosurgical oncology (now commercialized by CAE Healthcare).
- 2010/5      Outstanding Achievement Award - 1,500  
National Research Council Canada  
Prize / Award  
Citation: "For regional initiatives in the translation of non-invasive technologies to clinical neurosciences and to their commercialization"

## User Profile

Research Specialization Keywords: Imaging, MRI, fMRI, Biomedical Devices, Biophysics, Compressed Sensing, Quantitative Imaging, NMR, MEG/EEG

## Employment

- 2013/11      Cross-Appointment, School of Health Sciences  
School of Health Sciences, Faculty of Health Professions, Dalhousie University  
Full-time, Associate Professor  
Tenure Status: Non Tenure Track
- 2013/7      Research Scientist  
Diagnostic Imaging, IWK Health Centre  
Full-time  
Tenure Status: Non Tenure Track  
In addition to my role as a research scientist, I am the Scientific Lead for the Biomedical Translational Imaging Centre (a core research facility crossing the IWK and QEII Health Centres)
- 2013/6      Cross-Appointment, Department of Physics & Atmospheric Sciences  
Physics, Science, Dalhousie University  
Full-time, Associate Professor  
Tenure Status: Non Tenure Track
- 2012/7      Associate Professor, Dept. of Radiology  
Radiology, Medicine, Dalhousie University  
Full-time, Associate Professor  
Tenure Status: Non Tenure Track
- 2009/7      Cross-Appointment, School of Biomedical Engineering  
Biomedical Engineering, Engineering & Medicine, Dalhousie University  
Full-time, Associate Professor  
Tenure Status: Non Tenure Track
- 2003/6      Scientific Staff  
Diagnostic Imaging, QEII Health Sciences Centre  
Full-time, Adjunct  
Tenure Status: Non Tenure Track
- 2003/7 - 2013/6      Adjunct, Department of Physics  
Physics, Science, Dalhousie University  
Full-time, Adjunct  
Tenure Status: Non Tenure Track

2012/9 - 2013/4	Group Leader (Neuroscience) Medical Devices, National Research Council Canada Full-time Tenure Status: Non Tenure Track
2007/6 - 2013/4	Assoc. Research Officer Medical Devices, National Research Council Full-time Tenure Status: Non Tenure Track
2006/1 - 2012/6	Assist. Professor, Dept. of Radiology Radiology, Dalhousie University Full-time Tenure Status: Non Tenure Track
2003/6 - 2007/6	Assist. Research Officer Institute for Biodiagnostics (Atlantic), National Research Council Full-time Tenure Status: Non Tenure Track
2000/4 - 2003/5	Post Doctoral Fellow Research, Albuquerque, New Mexico, New Mexico Resonance Full-time Tenure Status: Non Tenure Track
1993/9 - 2000/4	Teaching Assistant Physics, Science, University of New Brunswick Part-time Tenure Status: Non Tenure Track
1998/6 - 1998/7	Course Instructor Dept. of Extension & Summer Services, University of New Brunswick Part-time Tenure Status: Non Tenure Track
1995/4 - 1995/9	Research Assistant Engineering, University of New Brunswick Full-time Tenure Status: Non Tenure Track
1993/5 - 1993/9	Research Assistant Physics, University of New Brunswick Full-time Tenure Status: Non Tenure Track

## Research Funding History

### Awarded [n=12]

2017/4 - 2022/3 Principal Applicant	4D Imaging of Spatially & Temporally Dynamic Biophysical Processes using Sparse Data Methods, Grant
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**Funding Sources:**

2017/4 - 2022/3      Natural Sciences and Engineering Research Council of Canada (NSERC)  
 Discovery Grant  
 Total Funding - 230,000  
 Portion of Funding Received - 230,000  
 Funding Competitive?: Yes

2016/4 - 2021/4  
 Co-applicant

CHILD BRIGHT, Grant

**Funding Sources:**

2016/4 - 2021/4      Canadian Institutes of Health Research (CIHR)  
 SPOR Networks in Chronic Disease  
 Total Funding - 25,000,000  
 Portion of Funding Received - 0  
 Funding Competitive?: Yes

Co-applicant : 169 Co-Applicants;

Principal Applicant : Annette Majnemer; Dan Goldowitz; Steven Miller

2015/7 - 2020/7  
 Principal Applicant

Automated Algorithms for Pre-Surgical Functional MRI, Contract

**Funding Sources:**

2015/7 - 2020/7      GE Healthcare (formerly General Electric Medical Systems)  
 Investigator Sponsored Research Program  
 Total Funding - 166,667  
 Portion of Funding Received - 166,667  
 Funding Competitive?: Yes

2015/7 - 2020/7  
 Principal Applicant

Push-Button Pi-RADS - Automated Classification of Multi-Parametric MRI using Machine Learning, Contract

**Funding Sources:**

2015/7 - 2020/7      GE Healthcare (formerly General Electric Medical Systems)  
 Investigator Sponsored Research Program  
 Total Funding - 166,667  
 Portion of Funding Received - 166,667  
 Funding Competitive?: Yes

Co-applicant : Sharon Clarke

2015/7 - 2020/7  
 Principal Applicant

MRI Technologies for Quantification of Liver Fatty Acid Profile with Iron Deposition, Contract

**Funding Sources:**

2015/7 - 2020/7      GE Healthcare (formerly General Electric Medical Systems)  
 Investigator Sponsored Research Program  
 Total Funding - 166,667  
 Portion of Funding Received - 166,667  
 Funding Competitive?: Yes

Co-applicant : Sharon Clarke;

Co-investigator : Chris Bowen

2015/3 - 2020/3  
 Principal Investigator

Developing Pushbutton MRI Technologies, Grant

**Funding Sources:**

2015/3 - 2020/3      Atlantic Canada Opportunities Agency  
 Atlantic Innovation Fund  
 Total Funding - 2,959,855  
 Portion of Funding Received - 2,959,855  
 Funding Competitive?: Yes

Co-applicant : Chris Bowen; Lauren Petley; Sharon Clarke; Tim Bardouille; Tynan Stevens; Xiaowei Song

2016/4 - 2019/3      The Biomedical Translational Imaging Centre: A Platform for De-Risking  
 Principal Applicant      Neurotechnologies, Grant

**Funding Sources:**

2016/4 - 2019/3      Brain Canada  
 Platform Support Grants  
 Total Funding - 449,829  
 Portion of Funding Received - 449,829  
 Funding Competitive?: Yes

Co-applicant : Chris Bowen; James Rioux; Kim Brewer; Lauren Petley; Tim Bardouille

2016/11 - 2018/11      Testing & Validation of Pre-Clinical Multispectral SPECT & Simultaneous PET/MRI using  
 Principal Applicant      Silicon Photomultiplier Technology, Grant

**Funding Sources:**

2016/11 - 2018/11      Natural Sciences and Engineering Research Council of Canada  
 (NSERC)  
 Collaborative Research & Development  
 Total Funding - 240,000  
 Portion of Funding Received - 240,000  
 Funding Competitive?: Yes

Co-investigator : Chris Bowen; James Rioux; Kim Brewer

2015/7 - 2018/7      Improving understanding of novel cancer therapies through molecular imaging, Grant  
 Co-applicant

**Funding Sources:**

2015/8 - 2018/7      Nova Scotia Health Research Foundation (NSHRF)  
 Establishment Grant  
 Total Funding - 148,885  
 Portion of Funding Received - 0  
 Funding Competitive?: Yes

Co-applicant : S. Clarke;

Co-investigator : C. Bowen;

Principal Investigator : K. Brewer

2016/4 - 2017/12      Developing Novel Pre-Clinical Applications of Silicon Photomultiplier Based Simultaneous  
 Principal Applicant      PET/MRI, Contract

**Funding Sources:**

2016/4 - 2017/12      Cubresa Inc.  
 Total Funding - 328,500  
 Portion of Funding Received - 328,500  
 Funding Competitive?: No

Co-investigator : Chris Bowen; James Rioux;

Principal Applicant : Kim Brewer

2012/4 - 2017/3  
Principal Investigator Novel Acquisition Techniques, Contrast Mechanisms & Analysis Algorithms for Studying Regional Differences in fMRI Sensitivity, Grant

**Funding Sources:**

2012/4 - 2017/3 Natural Sciences and Engineering Research Council of Canada (NSERC)  
Discovery  
Total Funding - 100,000  
Portion of Funding Received - 100,000  
Funding Competitive?: Yes

Principal Investigator : Steven Beyea

2015/12 - 2016/12  
Principal Applicant Investigating the Feasibility of a New Algorithm for Data-Driven Processing of Resting State fMRI Networks, Grant

**Funding Sources:**

2015/12 - 2016/12 Radiology Research Foundation  
Research Grants  
Total Funding - 5,000  
Portion of Funding Received - 5,000  
Funding Competitive?: Yes

Co-investigator : Chris Bowen; Javeria Hashmi; Tim Bardouille; Tonya Omisade

**Completed [n=26]**

2010/8 - 2016/8  
Co-investigator Elekta Neuromag Canada: The development of a translational imaging cluster in Halifax, Grant

**Funding Sources:**

2010/8 - 2016/8 Atlantic Canada Opportunities Agency  
Atlantic Innovation Fund  
Total Funding - 1,779,026  
Portion of Funding Received - 1,067,416  
Funding Competitive?: Yes

Co-investigator : Aaron Newman; David Clarke; Gerhard Stroink;

Principal Applicant : Patrick McGrath;

Principal Investigator : A. Ahonen; Donald Weaver; Ryan D'Arcy

2015/4 - 2016/4  
Co-applicant Staying A Head of the Game: Developing an Advanced Head Tracking System for Clinical and Research, Grant

**Funding Sources:**

2015/4 - 2016/4 InNOVAcorp (Nova Scotia)  
Early Stage Commercialization Fund  
Total Funding - 43,000  
Portion of Funding Received - 21,500  
Funding Competitive?: Yes

Principal Applicant : Tim Bardouille

2015/4 - 2016/3  
Principal Applicant Radio Frequency Shielded Booth for Multimodal Imaging Facilities, Grant

**Funding Sources:**

2015/4 - 2016/3      Natural Sciences and Engineering Research Council of Canada (NSERC)  
 Research Tools & Instruments  
 Total Funding - 23,404  
 Portion of Funding Received - 23,404  
 Funding Competitive?: Yes

Co-applicant : Aaron Newman; Thomas Trappenberg

2013/4 - 2016/3  
 Principal Applicant

Development of Novel MEG Technologies, Contract

**Funding Sources:**

2013/4 - 2016/3      Elekta Neuroscience Oy  
 Research Funding Support  
 Total Funding - 680,000  
 Portion of Funding Received - 580,000  
 Funding Competitive?: No

Co-applicant : Patrick McGrath; Ryan D'Arcy; Tim Bardouille;

Principal Applicant : Steven Beyea

2016/1 - 2016/3  
 Principal Applicant

Supporting the Development of Novel Therapeutics: On-site Biological Wet Laboratory with synchronous PET/MRI imaging, Grant

**Funding Sources:**

2016/1 - 2016/3      Atlantic Canada Opportunities Agency  
 BDP Infrastructure  
 Total Funding - 341,417  
 Portion of Funding Received - 341,417  
 Funding Competitive?: No

Principal Applicant : Kim Brewer

2011/4 - 2016/3  
 Co-investigator

The Rehabilitative and Diagnostic Innovation in Applied NeuroTechnology (RADIANT) CREATE Program, Grant

**Funding Sources:**

2011/4 - 2016/3      Natural Sciences and Engineering Research Council of Canada (NSERC)  
 CREATE  
 Total Funding - 1,650,000  
 Portion of Funding Received - 0  
 Funding Competitive?: Yes

Co-investigator : E. Leach; G. Eskes; M. Bance; R. D'Arcy; R. Klein; S. Boe; S. Johnson; T. Trappenberg;

Principal Investigator : A. Newman

2014/12 - 2015/12  
 Principal Applicant

Improving Patient Compliance to Non-Invasive MEG Language Mapping Using Engaging Videos, Grant

**Funding Sources:**

2014/12 - 2015/12      Radiology Research Foundation  
 Research Grants  
 Total Funding - 9,799  
 Portion of Funding Received - 9,799  
 Funding Competitive?: Yes



2012/7 - 2015/7 Co-investigator	<p>Co-applicant : Tim Bardouille;</p> <p>Co-investigator : D. McNeely; M. Murthy; T. Stevens</p> <p>NPAS3 variants in schizophrenia: a neuroimaging study, Grant</p> <p><b>Funding Sources:</b></p> <p>2012/7 - 2015/7      Nova Scotia Health Research Foundation (NSHRF) Establishment Grant Total Funding - 149,836 Portion of Funding Received - 0 Funding Competitive?: Yes</p>
2013/7 - 2015/7 Collaborator	<p>Co-investigator : Aitchison KJ; Bartha R.; Bernier D; MacIntyre G; McAllindon D; Purdon SE; Rusak B; Song X;</p> <p>Principal Applicant : Phil Tibbo</p> <p>Secondary Analysis of Neuroimaging Databases: Modeling the Heterogeneity of Brain Aging &amp; Dementia Risk, Grant</p> <p><b>Funding Sources:</b></p> <p>2013/7 - 2015/7      Canadian Institutes of Health Research (CIHR) Catalyst Total Funding - 100,000 Portion of Funding Received - 0 Funding Competitive?: Yes</p>
2015/3 - 2015/5 Principal Applicant	<p>Co-investigator : Ken Rockwood; Sandra Black;</p> <p>Collaborator : RCN D'Arcy;</p> <p>Principal Applicant : Xiaowei Song</p> <p>Supporting the Development &amp; Commercialization of Neuro-related Technologies, Grant</p> <p><b>Funding Sources:</b></p> <p>2015/3 - 2015/5      Atlantic Canada Opportunities Agency BDP Infrastructure Total Funding - 212,500 Portion of Funding Received - 100,000 Funding Competitive?: No</p>
2014/12 - 2015/5 Principal Investigator	<p>Co-applicant : David Clarke</p> <p>In Vivo &amp; Phantom Based Resolution/Sensitivity Benchmarking of a Multi-Pinhole Solid State Table-Top SPECT, Grant</p> <p><b>Funding Sources:</b></p> <p>2014/12 - 2015/5      Natural Sciences and Engineering Research Council of Canada (NSERC) Engage Plus Total Funding - 22,915 Portion of Funding Received - 22,915 Funding Competitive?: Yes</p>
2014/7 - 2014/9 Principal Applicant	<p>Neurotechnology Industry Research Symposium at the 19th International Conference on Biomagnetism, Grant</p>

**Funding Sources:**

2014/7 - 2014/9      Natural Sciences and Engineering Research Council of Canada (NSERC)  
 Regional Opportunities Fund  
 Total Funding - 5,000  
 Portion of Funding Received - 5,000  
 Funding Competitive?: Yes

2014/3 - 2014/9      Maximizing the Commercialization Impact of the 19th International Conference on  
 Principal Applicant      Biomagnetism, Grant

**Funding Sources:**

2014/3 - 2014/9      Brain Repair Centre  
 Knowledge Dissemination Grant  
 Total Funding - 10,000  
 Portion of Funding Received - 10,000  
 Funding Competitive?: Yes

2013/7 - 2014/7      Butyrylcholinesterase Neuroimaging Ligands for Early & Definitive Diagnosis of  
 Co-investigator      Alzheimer's Disease, Grant

**Funding Sources:**

2013/7 - 2014/7      Dalhousie Brain Repair Centre  
 Knowledge Translation Initiative  
 Total Funding - 30,000  
 Portion of Funding Received - 0  
 Funding Competitive?: Yes

Co-investigator : Chris Bowen;

Principal Investigator : Sultan Darvesh

2014/1 - 2014/6      Development and Spatial Resolution Enhancement of a Novel Gamma Camera  
 Principal Applicant      Technology for Bench-top SPECT Imaging, Grant

**Funding Sources:**

2014/1 - 2014/6      Natural Sciences and Engineering Research Council of Canada (NSERC)  
 Engage  
 Total Funding - 24,833  
 Portion of Funding Received - 24,833  
 Funding Competitive?: Yes

2014/1 - 2014/3      Supporting the Cost-Competitiveness of the MEG Lab: Helium Re-Liquifier, Grant  
 Principal Applicant

**Funding Sources:**

2014/1 - 2014/3      Atlantic Canada Opportunities Agency  
 BDP Infrastructure  
 Total Funding - 100,400  
 Portion of Funding Received - 100,400  
 Funding Competitive?: No

2014/1 - 2014/3      Supporting the Development of Novel Therapeutic Diagnostics: Pre-Clinical SPECT, Grant  
 Principal Applicant

**Funding Sources:**

2014/1 - 2014/3 Atlantic Canada Opportunities Agency  
BDP Infrastructure  
Total Funding - 76,950  
Portion of Funding Received - 76,950  
Funding Competitive?: No

2013/1 - 2014/1  
Co-applicant

Modelling Grip Force for Enhanced Specificity of Pre-Surgical Mapping for Primary Motor Cortex, Grant

**Funding Sources:**

2013/1 - 2014/1 Capital District Health Authority  
Research Fund  
Total Funding - 5,000  
Portion of Funding Received - 5,000  
Funding Competitive?: Yes

Co-investigator : Gerhard Stroink; Tim Bardouille; Tynan Stevens;

Principal Applicant : David Clarke

2010/10 - 2013/10  
Co-investigator

Quantitative Proton Spectroscopy of White Matter at 4 Tesla in First Episode Psychosis Part II: A Clinical Study, Grant

**Funding Sources:**

2010/10 - 2013/10 Canadian Institutes of Health Research (CIHR)  
Operating Grant  
Total Funding - 226,619  
Portion of Funding Received - 0  
Funding Competitive?: Yes

Co-investigator : Bartha, R; Bernier D; Good, K; Milliken, H; Song, X.;

Principal Investigator : Tibbo, Phil

2013/6 - 2013/9  
Principal Applicant

Evaluation of a novel MRI-compatible gamma camera for evaluating butyrylcholinesterase inhibitor neuroimaging ligands, Grant

**Funding Sources:**

2013/6 - 2013/9 Natural Sciences and Engineering Research Council of Canada (NSERC)  
Interaction  
Total Funding - 2,320  
Portion of Funding Received - 2,320  
Funding Competitive?: Yes

Co-investigator : Chris Bowen

2010/7 - 2013/7  
Co-investigator

Functional Neuroimaging of White Matter Integrity in Cognitive Dysfunction: Linking Neuroscience Research with Clinical Evaluation, Grant

**Funding Sources:**

2010/7 - 2013/7 Canadian Institutes of Health Research (CIHR)  
China-Canada Joint Health Initiative  
Total Funding - 149,400  
Portion of Funding Received - 20,000  
Funding Competitive?: Yes

Co-applicant : Zhang Y.;

Co-investigator : Song X.;

Principal Investigator : D'Arcy, Ryan

2007/4 - 2012/4

Principal Investigator

MRI Characterization of Implantable Drug Delivery Bioceramics, Grant

**Funding Sources:**

2007/4 - 2012/4      Natural Sciences and Engineering Research Council of Canada (NSERC)  
Discovery Grant  
Total Funding - 85,000  
Portion of Funding Received - 85,000  
Funding Competitive?: Yes

2009/8 - 2010/9

Co-investigator

Quantitative Proton Spectroscopy of White Matter at 4 Tesla in First Episode Psychosis Part 1: Development & Preliminary Testing of In Vivo Localized Proton MRS at 4T, Grant

**Funding Sources:**

2009/8 - 2010/9      Nova Scotia Health Research Foundation (NSHRF)  
Capacity Competitive Developmental Innovative Grant  
Total Funding - 14,000  
Portion of Funding Received - 0  
Funding Competitive?: Yes

Principal Investigator : Tibbo, Phil

2009/6 - 2010/6

Principal Investigator

Evaluation of ASE Spiral for Increased fMRI Specificity in Pre-Surgical Planning, Grant

**Funding Sources:**

2009/6 - 2010/6      Dalhousie University  
Radiology Research Foundation  
Total Funding - 9,716  
Portion of Funding Received - 9,716  
Funding Competitive?: Yes

Co-investigator : R.C.N. D'Arcy

2009/4 - 2010/4

Co-investigator

Development and Preliminary Testing of In Vivo Localized Proton Magnetic Resonance Spectroscopy at 4 Tesla, Grant

**Funding Sources:**

2009/4 - 2010/4      Nova Scotia Health Research Foundation  
Development/Innovation Grant  
Total Funding - 14,000  
Portion of Funding Received - 0  
Funding Competitive?: Yes

Co-investigator : Bartha R.; Bernier D; Song X;

Principal Investigator : Phil Tibbo

2009/4 - 2010/4

Co-investigator

Characterizing the effects of field strength on specificity in functional MRI: Application in pre-surgical mapping, Grant

**Funding Sources:**

2009/4 - 2010/4      Dalhousie Medical Research Foundation  
Total Funding - 10,700  
Portion of Funding Received - 0  
Funding Competitive?: Yes

Co-investigator : Clarke D; D'Arcy RCN; Eskes, G; Newman A; Stroink G;

Principal Investigator : Schmidt M

### Under Review [n=6]

2017/7 - 2020/7  
Co-applicant      Development of a Comprehensive Liver MRI Examination for Non-alcoholic Fatty Liver Disease, Grant

#### Funding Sources:

2017/7 - 2020/6      Nova Scotia Health Research Foundation (NSHRF)  
Establishment Grant  
Total Funding - 150,000  
Portion of Funding Received - 0  
Funding Competitive?: Yes

Co-investigator : A. Costa; C. Bowen; I. Stueck; I. Wanless; K. Peltekian;

Principal Investigator : S. Clarke

2017/7 - 2020/7  
Co-investigator      A Big Data Approach to Biomarkers for Treating Chronic Back Pain, Grant

#### Funding Sources:

2017/7 - 2020/6      Nova Scotia Health Research Foundation (NSHRF)  
Establishment Grant  
Total Funding - 149,919  
Portion of Funding Received - 0  
Funding Competitive?: Yes

Co-investigator : M. Lynch; S. Matwin;

Principal Investigator : J. Hashmi

2017/7 - 2020/7  
Co-investigator      Role of brain mechanisms of learning and expectation in chronic back pain, Grant

#### Funding Sources:

2017/7 - 2020/6      Nova Scotia Health Authority Research Fund  
Category 2 Research Grant  
Total Funding - 50,000  
Portion of Funding Received - 0  
Funding Competitive?: Yes

Co-investigator : D. Langstroth; M. Lynch; S. Matwin;

Principal Applicant : J. Hashmi

2017/7 - 2020/7  
Co-applicant      Staging & Treatment Monitoring of Pancreatic Cancer with Quantitative Magnetic Resonance Imaging, Grant

#### Funding Sources:

2017/7 - 2020/6      Nova Scotia Health Research Foundation (NSHRF)  
Establishment Grant  
Total Funding - 150,000  
Portion of Funding Received - 0  
Funding Competitive?: Yes

Co-investigator : R. Ramjeesingh; S. Clarke;

Principal Investigator : J. Rioux

2017/7 - 2018/7  
Co-investigator      Imaging for the preservation of hip articular cartilage in patients with femoral acetabular impingement, Grant

**Funding Sources:**

2017/7 - 2020/6 Nova Scotia Health Research Foundation (NSHRF)  
 Catalyst Grant  
 Total Funding - 50,000  
 Portion of Funding Received - 0  
 Funding Competitive?: Yes

Co-investigator : D. Rutherford; G. Boyd; I. Wong; J.P. King; J. Rioux;

Principal Investigator : R. Moyer

2017/7 - 2018/7  
 Co-investigator

Understanding mechanisms for accelerated knee osteoarthritis development in women,  
 Grant

**Funding Sources:**

2017/7 - 2018/6 Nova Scotia Health Research Foundation (NSHRF)  
 Catalyst Grant  
 Total Funding - 50,000  
 Portion of Funding Received - 0  
 Funding Competitive?: Yes

Co-investigator : E. Davis; R. Moyer; S. Landry;

Principal Investigator : J. Astephen

## Student/Postdoctoral Supervision

**Bachelor's Honours [n=14]**

2017/5 - 2017/9 Co-Supervisor	Jonathan Lazerez (In Progress) , Dalhousie University Thesis/Project Title: Dynamic Imaging using Cubresa PET/MRI Present Position: Student, UNB
2017/5 - 2017/9 Principal Supervisor	Allister Mason (Completed) , Dalhousie University Thesis/Project Title: Correlations between Expert Rater and Structural Similarity Image Metrics due to Compressed Sensing Artifacts in MRI Present Position: Student, Dalhousie University
2015/9 - 2016/12 Co-Supervisor	Sung-A Park (In Progress) , Dalhousie University Student Degree Expected Date: 2017/5 Thesis/Project Title: Senior (honours) engineering project in the development of GUI interface for parametric imaging data, focused on flexible data input, pre-processing and visualization of the processed results. Co-supervised by Dr. J. Rioux and I, who both provide input and guidance on the software design and outcomes. Present Position: Engineering undergraduate student, Dalhousie University
2015/9 - 2016/12 Co-Supervisor	Aneek Datta (In Progress) , Dalhousie University Student Degree Expected Date: 2017/5 Thesis/Project Title: Senior (honours) engineering project in the development of data analysis tools for parametric imaging data, focused on analysis of processed maps and deployment of the finished GUI product. Co-supervised by Dr. J. Rioux and I, who both provide input and guidance on the software design and outcomes. Present Position: Undergraduate engineering student, Dalhousie University

2015/9 - 2016/12 Co-Supervisor	Morgan Richardson (In Progress) , Dalhousie University Student Degree Expected Date: 2017/5 Thesis/Project Title: Senior (honours) engineering project in the development of the GUI tools for multi-parametric imaging data, focused on the overall user interface design and implementation, including data display. Co-supervised by Dr. J. Rioux and I, who both provide input and guidance on the software design and outcomes. Present Position: Undergraduate engineering student, Dalhousie University
2015/6 - 2017/4 Co-Supervisor	Maria Cristina Suteanu (In Progress) , Dalhousie University Thesis/Project Title: dSPM analysis pipeline development for language lateralization of MEG and comparison to 3T MRI. Project was co-supervised by myself and MEG scientist Dr. T. Bardouille, who contributed equally to the supervision. Present Position: Medical Student at Dalhousie, Dalhousie University
2015/5 - 2016/4 Co-Supervisor	John Lincoln (Completed) , Dalhousie University Thesis/Project Title: "Characterization of MEG Source Imaging Localization Accuracy using Differing Head Digitization Technologies". Done as summer research project and subsequent honours project. Part of an industry collaboration with Elekta Neuromag (Sweden) and Northern Digital Inc, that resulted in a Technical Feasibility Report and a Product Development Report to Elekta. Project was co-supervised by Dr. T. Bardouille and I, who jointly contributed to the overall design and data analysis. Present Position: Graduate student in medical physics, Dalhousie U. Medical Physics Program
2015/4 - 2015/8 Principal Supervisor	Allister Mason (All But Degree) , Dalhousie University Student Degree Expected Date: 2017/5 Thesis/Project Title: NSERC USRA Project: Retrospective under sampling of DCE time course images and evaluation of the effect of k-space sampling pattern Present Position: Undergraduate physics student, Dalhousie University
2015/1 - 2015/8 Principal Supervisor	Christopher O'Grady (Completed) , Dalhousie University Thesis/Project Title: Adaptation of test-retest fMRI analysis of spatial reliability to a single-run approach using a pseudo-random resampling approach (undergraduate summer research assistant) Present Position: Graduate student in my lab, Dalhousie University
2014/9 - 2014/12 Co-Supervisor	Kathleen Moriarity (Completed) , Simon Fraser University Thesis/Project Title: Software pipeline development for test-retest of resting state MEG data (undergraduate summer research assistant), this work was co-supervised by MEG scientist Dr. T. Bardouille. Present Position: Software Developer in private industry
2011/5 - 2011/9 Co-Supervisor	Cathryn Parsons (Completed) , Acadia University Thesis/Project Title: Pre-clinical imaging of cellular density using SPIO mapping (undergraduate summer research assistant) Present Position: PhD student in medical physics, Dalhousie U. Medical Physics Program
2010/9 - 2011/4 Principal Supervisor	Lyndsay Cherpak (Completed) , Dalhousie University Thesis/Project Title: Monte carlo simulation of T2 effects in white matter during an inter-hemispheric transfer task (undergraduate honours project) Present Position: Radiology Resident
2010/5 - 2010/8 Principal Supervisor	James Dube, Dalhousie University Thesis/Project Title: Summer student research, doing analysis of a multi-sequence benchmarking comparison of fMRI techniques Present Position: unknown

2010/5 - 2010/9  
Principal Supervisor Lyndsay Cherpak (Completed) , Dalhousie University  
Thesis/Project Title: NSERC USRA Project: Analysis of fMRI data using a novel asymmetric spin echo spiral EPI sequence  
Present Position: Radiology Resident

### Master's Thesis [n=9]

2017/9 - 2017/8  
Co-Supervisor Matthew Strugari (In Progress) , Dalhousie University  
Thesis/Project Title: Optimizing Acquisition Strategies for Dynamic and Simultaneous PET/MRI in Pre-Clinical Applications  
Present Position: Student, Dalhousie University

2017/9 - 2019/8  
Principal Supervisor Miriam Hewlett (In Progress) , Dalhousie University  
Thesis/Project Title: Optimization of Compressed Sensing Acquisition Under-Sampling Pattern for Mapping Fatty Acid Profiles in the Liver  
Present Position: Student, Dalhousie University

2017/9 - 2019/8  
Co-Supervisor Mary Miedema (In Progress) , Dalhousie University  
Thesis/Project Title: Optimizing SpatioTemporal Reliability in MEG Beamformer Imaging  
Present Position: Student, Dalhousie University

2017/9 - 2019/8  
Principal Supervisor Allister Mason (In Progress) , Dalhousie University  
Thesis/Project Title: Optimizing Dynamic Contrast Enhancement using REPCOM  
Present Position: Student, Dalhousie University

2015/9 - 2017/8  
Principal Supervisor Nathan Murtha (In Progress) , Dalhousie University  
Student Degree Expected Date: 2017/10  
Thesis/Project Title: Creation and application of a novel synthetic phantom for characterizing the effect of under-sampling on dynamic time-series data.  
Present Position: Graduate Student, Dalhousie University

2015/9 - 2017/8  
Principal Supervisor Sarah McLeod (In Progress) , Dalhousie University  
Student Degree Expected Date: 2017/10  
Thesis/Project Title: Test-retest spatial reliability of MEG data, simulation and experiment, and the effect of varying pseudo-random resampling of data epochs. Sarah is supervised by me, and also receives co-supervision by Dr. T. Bardouille. This research is based off of my NSERC Discovery funded research, and flows directly from the work in fMRI done by my former PhD student, with Dr. Bardouille providing direction on MEG source localization technologies.  
Present Position: Graduate student in my lab, Dalhousie University

2015/9 - 2017/8  
Principal Supervisor Chris O'Grady (In Progress) , Dalhousie University  
Student Degree Expected Date: 2017/10  
Thesis/Project Title: Examining the relative efficacy of different measures of entropy in both the temporal and Fourier domains.  
Present Position: Graduate Student, Dalhousie University

2014/9 - 2016/11  
Co-Supervisor Alexander Rudiak (Completed) , Dalhousie University  
Thesis/Project Title: Development of a longitudinal support vector approach to machine learning of temporal trends in MEG data. Alex is co-supervised by Dr. T. Bardouille and I, who jointly provide input into the study design and analysis.  
Present Position: Research Associate in the lab of Dr. T. Bardouille, Dalhousie University

2008/9 - 2010/4  
Principal Supervisor Stevens Tynan (Completed) , Dalhousie University  
Thesis/Project Title: "Analysis of fMRI for pre-surgical mapping: reproducibility, automated thresholds, and diagnostic accuracy".  
Present Position: Post-Doctoral Fellow, University of Chicago



**Doctorate [n=6]**

2010/9 - 2015/8 Principal Supervisor	<p>Tynan Stevens (Completed) , Dalhousie University</p> <p>Thesis/Project Title: "Enhancing the reliability of fMRI and MEG for pre-surgical mapping". One of the published technologies from this thesis, which provides an automated method for selecting processing pipelines for block-design fMRI, has formed one of the projects that is part of my research partnership with General Electric.</p> <p>Present Position: Postdoctoral Fellow, University of Chicago</p>
2007/9 - 2012/5 Co-Supervisor	<p>Jodie Gawryluk (Completed) , Dalhousie University</p> <p>Thesis/Project Title: "An investigation of fMRI activation in white matter at 4T". Jodie received her PhD in neuroscience, and hence had co-supervision by Dr. D'Arcy (Neuroscience) and myself. Dr. D'Arcy was responsible for paradigm design and statistical analysis, and I was responsible for design of the novel fMRI pulse sequence used, and its contrast optimization (both acquisition &amp; post-processing), which was a core part of my NSERC Discovery.</p> <p>Present Position: Assistant Professor, U. Victoria</p>
2007/9 - 2012/10 Co-Supervisor	<p>James Rioux (Completed) , Dalhousie University</p> <p>Thesis/Project Title: "Quantitative Magnetic Resonance Imaging of Cellular Density with TurboSPI". This project was co-supervised by Dr. C. Bowen and myself. Dr. Bowen is an expert in SPIO quantification, and I have expertise in the single-point MRI techniques used to collect the data (including the original published method on which Dr. Rioux's thesis work was based). A variant of this technology now forms one of the projects (fatty acid profile in liver) that is part of my collaboration with General Electric.</p> <p>Present Position: was PDF @ Stanford U., now Assistant Professor, Dalhousie University, Dalhousie University</p>
2007/9 - 2012/5 Co-Supervisor	<p>Erin Mazerolle (Completed) , Dalhousie University</p> <p>Thesis/Project Title: "Detecting Interhemispheric transfer across the corpus callosum using high field fMRI". Erin received her PhD in neuroscience, and hence had co-supervision by Dr. D'Arcy (Neuroscience) and myself. Dr. D'Arcy was responsible for paradigm design and statistical analysis, and I was responsible for design of the novel fMRI pulse sequence used, and its contrast optimization (both acquisition &amp; post-processing), which was a core part of my NSERC Discovery.</p> <p>Present Position: Post-Doctoral Fellow, U. Calgary</p>
2006/9 - 2011/5 Principal Supervisor	<p>Josh Bray (Completed) , Dalhousie University</p> <p>Thesis/Project Title: "Non-destructive characterization of degradation and drug release processes in calcium polyphosphate bioceramics using MRI". This project came out of my earlier NSERC Discovery program, using relaxometry and diffusion imaging to characterize the physical properties of a novel biomaterial.</p> <p>Present Position: Research Fellow, University of Nottingham, UK</p>
2005/1 - 2010/5 Principal Supervisor	<p>Kim Brewer (Completed) , Dalhousie University</p> <p>Thesis/Project Title: "Improved Functional Magnetic Resonance Imaging at 4-Tesla". Dr. Brewer was my PhD student in physics, who developed and validated a novel spiral imaging approach for fMRI.</p> <p>Present Position: was PDF @ Stanford U., now Assistant Professor, Dalhousie University, Dalhousie University</p>

**Post-doctorate [n=1]**

2015/4 - 2017/1  
Principal Supervisor Steve Patterson (Completed) , IWK Health Centre  
Thesis/Project Title: Funded from my ACOA AIF grant, Steve performs research in multivariate and univariate approaches to data analysis and image reconstruction. While involved in a number of projects using machine learning, he currently has primary responsibility for the AIF multi-parametric mapping machine learning project, which is part of an industry collaboration with General Electric.  
Present Position: NSHRF REAL Impact Fellow in Data Analytics, N.S. Health Research Foundation

**Certificate [n=1]**

2015/8 - 2015/12  
Co-Supervisor Merin Nazeem, Dalhousie University  
Thesis/Project Title: Co-op engineer in the Internationally Educated Engineers program in Nova Scotia. Obtained training in medical technology research and biomedical engineering through actively working on data acquisition and analysis using imaging technology. Merin was co-supervised by Dr. K. Brewer, and we each provided input as to the progress and direction of work by Merin.  
Present Position: unknown

**Research Associate [n=4]**

2013/4 - 2016/7  
Co-Supervisor Santosh Vema Krishnamurthy (Completed) , Dalhousie University/IWK  
Thesis/Project Title: Santosh had primary responsibility for the design and development MEG head digitization and co-registration acquisition and analysis. This research was part of an industry partnered study initially with Elekta Neuromag. Santosh reported directly to me, and was co-supervised by myself and Dr. T. Bardouille (MEG scientist).  
Present Position: Research Associate in the lab of Dr. Alon Freidman, Dalhousie University

2013/4 - 2019/3  
Principal Supervisor David McAllindon, Dalhousie University/IWK  
Thesis/Project Title: Funded from my Brain Canada grant, Dave is a research technician working on neurotechnology projects in collaboration with industry partners. He has primary responsibility for developing data analysis pipelines for a number of industry partnered research projects, as well as internal projects aimed at commercialization. His primary involvement is in fMRI and MR Spectroscopy experiments.  
Present Position: Research Associate, Dalhousie University/IWK

2012/7 - 2013/7  
Principal Supervisor Kirk Feindel (Completed) , Dalhousie University/IWK  
Thesis/Project Title: After leaving NRC, I hired Kirk as a research associate scientist, in my role as Scientific Director for the BIOTIC imaging centre, with responsibility for MRI acquisition and analysis technologies for epilepsy research.  
Present Position: Assistant Professor, University of Western Australia

2010/1 - 2014/8  
Co-Supervisor Xiaowei Song, NRC/Dalhousie  
Thesis/Project Title: Co-supervised by myself and a neuroscientist, Dr. Song performed research and provided research support in neuroimaging analysis techniques. Dr. Song was initially co-supervised by me while at NRC, and I hired her to continue to work for me doing similar neuroimaging data analysis projects after leaving NRC, in my role as Scientific Director for the BIOTIC imaging centre.  
Present Position: Staff Scientist, Surrey Regional Health, BC

**Technician [n=12]**

2016/9 - 2019/3 Principal Supervisor	Jessica Luedi, IWK Thesis/Project Title: Funded from my Brain Canada grant, Jessie is a research technician working on neurotechnology projects in collaboration with industry partners. She has primary responsibility for data management, subject management, and REB protocol submissions, for a number of industry partnered research projects, as well as internal projects aimed at commercialization. Present Position: Research Co-ordinator in my lab, IWK/Dal
2016/7 - 2016/12 Co-Supervisor	Ollie Marriott (In Progress) , Dalhousie University Thesis/Project Title: Effect of retrospective under-sampling of DISCO DCE data on classification accuracy using machine learning. Ollie is co-supervised by myself and Dr. J. Rioux. Dr. Rioux provides input on analysis techniques for the project, but primary responsibility for research direction, design, funding etc are mine. Present Position: Research Assistant in my lab, Dalhousie University/IWK
2016/4 - 2019/3 Principal Supervisor	Suzanne Daniels, Dalhousie University Thesis/Project Title: Funded from my Brain Canada grant, Suzanne is a research assistant working on neurotechnology projects in collaboration with industry partners. She has primary responsibility for data collection, subject recruitment, and some data analysis, for a number of industry partnered research projects, as well as internal projects aimed at commercialization. She has had responsibility for projects in MRI, MEG and EEG. Present Position: Research Technician, Dalhousie University/IWK
2014/10 - 2017/3 Co-Supervisor	Ron Bishop, Dalhousie University/IWK Thesis/Project Title: Research technician performing work in MEG data acquisition and analysis. Reporting directly to me in my role as Scientific Director for the BIOTIC imaging centre, with co-supervision by Dr. T. Bardouille, he has responsibility for day-to-day data collection, analysis and maintenance of the MEG system. Present Position: MEG Research Technician, Dalhousie University/IWK
2014/1 - 2014/12 Co-Supervisor	Emily LeBlanc, IWK/Dalhousie Thesis/Project Title: Performed data analysis and created the analysis pipeline for a neuroimaging project involving a large image database. Present Position: Unknown
2013/4 - 2014/10 Co-Supervisor	Maggie Clarke (Completed) , Dalhousie University/IWK Thesis/Project Title: After leaving NRC I hired Maggie as the lead MEG technologist. Reporting directly to me, in my role as Scientific Director for the BIOTIC imaging centre, she had responsibility for day-to-day data collection, analysis and maintenance of the MEG system. Present Position: PhD Student, University of Washington MEG Lab
2013/4 - 2017/3 Co-Supervisor	Christa Davis, Dalhousie University/IWK Thesis/Project Title: Christa is the small animal imaging technologist responsible for animal handling, surgeries, injections, etc. Since 2015 she is shared between myself and Dr. K. Brewer. Present Position: Research Technician, Dalhousie University/IWK
2012/7 - 2013/4 Principal Supervisor	Drew Debay, Dalhousie University/IWK Thesis/Project Title: Drew as the lead research technologist responsible for getting all small animal imaging (MRI and PET/CT research instruments, at the time) programs operating. Drew reported directly to me, in my role as Scientific Director for the BIOTIC imaging centre, and he was responsible for data collection, analysis and maintenance of these research systems. Present Position: PhD Student in Neuroscience with Dr. S. Darvesh, Dalhousie University

2011/7 - 2013/8 Co-Supervisor	Graham Little (Completed) , Dalhousie University/IWK Thesis/Project Title: Algorithm development and coding for automated MEG language lateralization program, as part of an industry partnered project with Elekta Neuromag (co-supervision along with Dr. T. Bardouille). Present Position: PhD Student, University of Alberta
2010/6 - 2011/8 Co-Supervisor	Sean McWhinney (Completed) , Dalhousie University/NRC Thesis/Project Title: Research assistant working on analysis of white fMRI contrast study, with co-supervision by myself and Dr. D'Arcy (neuroscience). Dr. D'Arcy provided the supervision on neuroscience aspects of the project (paradigm design, neuro interpretation etc), while I provided supervision on the contrast optimization and interpretation from data acquired using the pulse sequence that I had developed. Present Position: PhD Student in Neuroscience with Dr. A. Newman, Dalhousie University
2008/7 - 2013/1 Co-Supervisor	Sujoy Ghosh Hjara (Completed) , Dalhousie University/IWK Thesis/Project Title: Sujoy originally worked under my co-supervision while at NRC performing computer coding and data analysis. After I left NRC I hired him as a research technician, in my role as Scientific Director for the BIOTIC imaging centre, to perform initial coding of an fMRI mapping analysis. Present Position: PhD Student, Simon Fraser University
2007/7 - 2011/8 Principal Supervisor	Careesa Liu (Completed) , NRC Thesis/Project Title: Careesa was my MRI research technician for the 4T MRI. She was generally responsible for acquisition of data and quality assurance. She was the lead HQP trainee responsible for building the variable density spiral trajectory design and implementation, that resulted in our paper on this topic. Present Position: PhD Student, Simon Fraser University

## Event Administration

2015/9 - 2017/9	Co-Chair, 14th International Conference on Magnetic Resonance Microscopy (held in Halifax, NS) - Approximately 250 Attendees, Conference, 2017/8 - 2017/8
2014/8 - 2014/8	Co-Chair, 19th International Conference on Biomagnetism (held in Halifax, NS) - Approximately 540 Attendees, Conference, 2012/8 - 2014/9

## Organizational Review Activities

2016/11 - 2017/3	Working Group - Panel Member, Government of Nova Scotia Performed a review and provided recommendations to the Province of Nova Scotia, through BioNova, on the future of life sciences research and its commercialization in the province.
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## Knowledge and Technology Translation

- 2014/7 - 2020/7      Lead Scientist, R&D Collaboration with Industry  
 Group/Organization/Business Serviced: GE Healthcare  
 Target Stakeholder: Industry/Business (>500 employees)  
 Outcome / Deliverable: Active research collaboration aimed at 3 technologies that directly support GE's product development roadmap for their MRI product. Monthly technical reports are also written and provided to GE MRI R&D team, with source code for the initial test phase technologies already delivered to GE's engineering teams.  
 Evidence of Uptake/Impact: GE has provided \$500k in cash across 3 projects, as well as \$167k in in-kind contribution to the projects. My lab, along including my trainees, participate in 1-hour monthly teleconferences with the Chief MRI Scientist, Head of Neuro MRI and the Head of Body MRI, the Canadian Research Manager, and the Global MRI Research Manager for General Electric. In these meetings, we provide monthly research progress and jointly collaborate on research strategies. For all three products, we have recently transferred code for our algorithms to-date so that they can be evaluated by GE's MRI R&D team.  
 Activity Description: Involved in a research collaboration with GE Healthcare that is aimed at commercialization of new imaging technologies. All required IP and research agreements are in place.
- 2013/12 - 2018/12      Lead Scientist, R&D Collaboration with Industry  
 Group/Organization/Business Serviced: Cubresa Inc.  
 Target Stakeholder: Industry/Business-Small (<100 employees)  
 Outcome / Deliverable: Development of two new pre-clinical imaging technologies, one in SPECT and one in PET imaging.  
 Evidence of Uptake/Impact: Initial research collaboration has resulted in a product being successfully commercialized, and an associated royalty agreement. This research partnership has now lead to stage 2, where we are co-developing a system for simultaneous PET/MRI in a pre-clinical system. Technical development is planned to be done through an NSERC CRD grant (pending), with applications development done through a \$328k Collaborative Research Agreement (signed July 2016). All research and IP agreements signed and in place.  
 Activity Description: Lead a research collaboration with Cubresa Inc. (a Canadian start-up company) that is aimed at commercialization of new pre-clinical imaging technologies. My lab and trainees worked side-by-side with Cubresa Inc. R&D staff, including bi-weekly research meetings, to help move this technology forward. In my lab we are responsible for system integration, testing, and validation of new hardware and reconstruction algorithms, as well as the development of new applications and algorithms.
- 2013/6 - 2018/6      Executive Committee Member, Research Uptake Strategies  
 Group/Organization/Business Serviced: Canadian MEG Consortium  
 Target Stakeholder: Academic Personnel  
 Outcome / Deliverable: Participate as a board member for the Canadian MEG Consortium  
 Activity Description: Participation in a national research consortium that aims to develop pan-Canadian research in MEG.

- 2015/8 - 2017/8  
 Executive Committee Member, Research Uptake Strategies  
 Group/Organization/Business Serviced: Ampere Society  
 Target Stakeholder: Academic Personnel  
 Outcome / Deliverable: Serve as an ex officio member of the Executive Committee for the Ampere Society's Division of Spatially Resolved Magnetic Resonance.  
 Evidence of Uptake/Impact: For a two year period I will serve on the executive for this international committee.  
 References / Citations / Web Sites: <http://www.icmrm.org/committee.php>  
 Activity Description: Member of the executive committee for Ampere's Division of Spatially Resolved Magnetic Resonance.
- 2013/7 - 2017/7  
 Research Scientist, R&D Collaboration with Industry  
 Group/Organization/Business Serviced: Treventis Inc.  
 Target Stakeholder: Industry/Business-Small (<100 employees)  
 Outcome / Deliverable: Collaboration with Treventis Inc, to provide pre-clinical validation on efficacy of a potential new radio-tracer that targets butrycholinesterase.  
 Evidence of Uptake/Impact: Initial research supported by a \$30k grant from the Brain Repair Centre, with current work supported in part by my Platform Support Grant from Brain Canada.  
 Activity Description: Collaboration in which my lab is providing pre-clinical evaluation, using both PET and SPECT imaging, of the efficacy of a novel tracer developed by a researcher at the company.
- 2016/10 - 2017/3  
 Research Scientist, R&D Collaboration with Industry  
 Group/Organization/Business Serviced: Northern Digital Inc (NDI)  
 Target Stakeholder: Industry/Business-Medium (100 to 500 employees)  
 Outcome / Deliverable: A technical report summarizing findings of a study that we design and executed, utilizing a new technology being developed by Waterloo Ontario based NDI.  
 Evidence of Uptake/Impact: NDI approached my lab, based on our expertise in the field and evidence for successful academic-industry partnership in the field of imaging.  
 Activity Description: Co-investigator on a collaborative research project that aims to validate and improve a novel technology for digitization that is being developed by NDI.
- 2016/9 - 2017/3  
 Research Scientist, R&D Collaboration with Industry  
 Group/Organization/Business Serviced: Densitas Inc.  
 Target Stakeholder: Industry/Business-Small (<100 employees)  
 Outcome / Deliverable: Funded by an InnovaCorp Innovation Voucher, we will create a report evaluating the potential to develop a novel automated algorithm for breast imaging analysis.  
 Evidence of Uptake/Impact: CEO of Densitas Inc. approached my lab, based on our expertise in the field and evidence for successful academic-industry partnership in the field of imaging.  
 Activity Description: Along with my team, we are developing an initial framework for novel approaches to a specific problem in breast image analysis, with an aim to use this as the basis for a larger collaboration that would jointly develop and validate this algorithm.

- 2012/4 - 2016/8      Lead Scientist, R&D Collaboration with Industry  
 Group/Organization/Business Serviced: Elekta Neuroscience  
 Target Stakeholder: Industry/Business (>500 employees)  
 Outcome / Deliverable: Research partnership/collaboration involving the development of new MEG technologies.  
 Evidence of Uptake/Impact: Licences for two resulting technologies from my lab are currently in negotiation between respective institutional lawyers.  
 Activity Description: This multi-year collaboration involved researchers and trainees in my lab working closely with Elekta Neuroscience Oy R&D staff to develop and validate several new technologies that they now wish to integrate into their MEG product. All required IP and research agreements are in place.
- 2014/10 - 2014/10      Moderator, Technology Transfer and Commercialization  
 Group/Organization/Business Serviced: Bioport Atlantic 2014  
 Target Stakeholder: Industrial Association/Producer Group  
 Outcome / Deliverable: Moderated a panel discussion on the future of life sciences research and development in Atlantic Canada  
 References / Citations / Web Sites: <https://bioportatlantic.ca>  
 Activity Description: Moderated a discussion panel of the Future of the Life Sciences Research & Commercialization in Atlantic Canada at BioPort Atlantic 2013 Conference.
- 2013/2 - 2013/3      Advisory Member, Consultation Service  
 Group/Organization/Business Serviced: Policy Horizons Canada  
 Target Stakeholder: Government Personnel  
 Outcome / Deliverable: Provided consultation on neuroimaging technology for their project titled "Transformative Science & Technologies"  
 Evidence of Uptake/Impact: Public policy document being prepared that will be given to policy makers in the Canadian Federal Government
- 2013/2 - 2013/2      Presenter, Consultation Service  
 Group/Organization/Business Serviced: Annual meeting of the Directors General for Federal Development Agencies  
 Target Stakeholder: Government Personnel  
 Outcome / Deliverable: Gave invited presentation on strategies for translating biomedical research to commercial partners

## International Collaboration Activities

- 2016/10      Co-Investigator United Kingdom  
 Dr. Gary Greene, Professor of Neuroimaging at York University, and I are collaborating on a project that aims to take the MEG analysis technology that I am working on with graduate student Sarah McLeod, and explore its use in creating automated quality assurance metrics for a distributed dipole phantom. Dr. Greene recently travelled to my lab for several days to begin jointly developing the project plan. The collaboration has been driven by Dr. Greene contacting me to express interest in working together, after his having attended the BioMag conference that I chaired here in Halifax in 2014.
- 2015/7      Principal Investigator, United States  
 Through my ongoing research partnership with GE Healthcare, I lead a very active collaboration with 3 of the scientists at GE's MRI division (Dr. Scott Hinks, Chief MRI Scientist, Dr. Ersin Bayram, Head of Body MRI, and Dr. Ajit Shankaranarayanan, Head of Neuro MRI). Through this collaboration we have standing monthly meetings where we discuss that month's research and strategize on current challenges, share alpha/beta software modules when needed to mutually advance research, etc.

2011/1 - 2013/7 Principal Investigator, United Kingdom  
 Collaboration with research group at University of Cambridge around developing Compressed Sensing methods for fMRI image reconstruction. It resulted in a co-authored publication in Magnetic Resonance in Medicine.

## Committee Memberships

2012/7 - 2020/7 Committee Member, Medical Physics Graduate Education Committee, Dalhousie University  
 Member of the Medical Physics Graduate Education Committee that oversees the CAMPEP accredited training program, offered through the Department of Physics at Dalhousie University.

2016/7 - 2019/7 Committee Member, Dean's Research Advisory Committee, Dalhousie University  
 Member of the Dean's advisory committee that looks at institutional recommendations and planning around research and research infrastructure, core facilities, etc.

2012/9 - 2018/9 Chair, Health Sciences Research Committee, Dalhousie University  
 I chair a committee that looks to create strategies across the school of health science to improve the impact of research in this field.

2015/7 - 2018/7 Committee Member, Institute for Research in Materials Graduate Education Committee, Dalhousie University  
 Member of a committee, formed jointly as part of the Dalhousie Institute for Research in Materials and its associated NSERC CREATE Program, to create novel opportunities for interdisciplinary graduate student training.

2013/7 - 2018/7 Committee Member, National Executive Committee, Canadian MEG Consortium  
 I serve as a representative of the MEG lab in Halifax on the Canadian MEG Consortium board, which does work to organize national initiatives in MEG research and education.

2015/4 - 2018/4 Committee Member, Member of the CIHR College of Reviews, Canadian Institutes of Health Research  
 Full member of the college of reviewers

2015/9 - 2017/9 Ex-Officio, Executive Committee - Division of Spatially Resolved Magnetic Resonance, Ampere Society  
 As conference co-chair, I am an Ex Officio Member of the Executive Committee for this 2 year period.

2014/9 - 2017/9 Committee Member, CIHR Foundation Scheme, Canadian Institutes of Health Research  
 Review committee member for virtual review of CIHR Foundation Scheme applications

2016/4 - 2017/4 Committee Member, Major Research Initiative - Large Infrastructure Fund Review Committee, Ontario Research Fund  
 Participated as a review panel member both in July 2016 (NOI review stage) and April 2016 (full application stage) for the Ontario Research Fund's Major Research Initiative - Large Infrastructure Fund.

2014/9 - 2017/4 Committee Member, NSHA Research Fund, NSHA Research Fund  
 Grant review panel member

2013/10 - 2016/10 Committee Member, MRI Technology Training Program Advisory Board, Red River College of Applied Arts, Science and Technology

2013/7 - 2015/7 Committee Member, Medical Physics & Imaging Research Committee, Canadian Institutes of Health Research  
 Review committee member for the CIHR Medical Physics & Imaging panel.



2014/10 - 2015/4	Committee Member, NCE Expert Panel, Natural Sciences and Engineering Research Council of Canada (NSERC) Was a member of the Expert Panel reviewing National Centre's of Excellence renewal and 5-year review of the CIMTEC CECR.
2010/9 - 2012/2	Committee Member, NSERC ad hoc RTI Committee, Natural Sciences and Engineering Research Council of Canada (NSERC) Committee member for the ad hoc committee reviewing NSERC RTI applications.
2009/2 - 2010/2	Chair, NSERC GSC 21 (Interdisciplinary) Research Committee, Natural Sciences and Engineering Research Council of Canada (NSERC) Committee chair for GSC 21 (Interdisciplinary) during the 2010 NSERC Discovery Grant competition.
2007/2 - 2010/2	Committee Member, EG 1505 (Physics) Committee Member and GSC 21 (Interdisciplinary) Committee Member, Natural Sciences and Engineering Research Council of Canada (NSERC) NSERC Discovery grant reviewer on GSC 21 (2007-10) and EG 1505 (2009-2010)

## Presentations

- (2017). Bringing Functional Neuroimaging Technologies into the Clinic: Challenges & Opportunities. 22nd Atlantic Canadian Clinical Engineering Society, Moncton, Canada  
Main Audience: Knowledge User  
Invited?: Yes, Keynote?: No
- (2017). Benefits & Pitfalls of Compressed Sensing MRI in the Clinic. GE Healthcare MR Technologists Education Conference, Halifax, Canada  
Main Audience: Knowledge User  
Invited?: Yes, Keynote?: No
- Alon Friedman. (2017). Imaging biomarkers for neurodegeneration using DCE-MRI and MEG/EEG. Neuroscience Research Unit Seminar, Pfizer Worldwide Research & Development Centre, Boston, United States  
Main Audience: Researcher  
Invited?: Yes, Keynote?: No
- (2016). Compressed Sensing: How does it work and what do you need to know?. NSHA Radiology Grand Rounds, Halifax, Canada  
Main Audience: Knowledge User  
Invited?: Yes, Keynote?: No
- (2016). How industry partnerships help move research technology into practice. NSHA Innovation Rounds, Halifax, Canada  
Main Audience: Knowledge User  
Invited?: Yes, Keynote?: Yes
- (2015). Opportunities and Challenges in Image Acceleration & Automation. Memorial University of Newfoundland Physics Department Colloquium Series, St. John's, Canada  
Main Audience: Researcher  
Invited?: Yes, Keynote?: No
- (2015). Can advances in medical imaging research allow the brain to guide its own stroke rehabilitation?. QEII Foundation Donor Event, Halifax, Canada  
Main Audience: General Public  
Invited?: Yes, Keynote?: Yes

8. (2015). The Development and Validation of Novel Computer Guided Tools for Improved Pre-Surgical fMRI. CMA/CAMRT Educational Webinar Series, Webinar, Canada  
Main Audience: Knowledge User  
Invited?: Yes, Keynote?: No
9. (2015). What if biomedical research was an economic engine?. 2nd Annual Research & Innovation in Healthcare Forum, Halifax, Canada  
Main Audience: General Public  
Invited?: Yes, Keynote?: No
10. (2014). The challenges for translating novel imaging technologies into commercial products. 2014 Neurotechnology Innovation, Commercialization & Entrepreneurship (NICE) Summer Institute, Halifax, Canada  
Main Audience: Knowledge User  
Invited?: Yes, Keynote?: No
11. C. Bowen. (2013). The Role of Multimodal Imaging in Novel Clinical and Pre-Clinical Cancer Therapies. CDHA Oncology Research Rounds, Halifax, Canada  
Main Audience: Knowledge User  
Invited?: Yes, Keynote?: No
12. Sharon Clarke. (2013). Novel MRI Technologies for Automated & Data Driven Diagnostics. GE Healthcare World Headquarters, Milwaukee, United States  
Main Audience: Knowledge User  
Invited?: Yes, Keynote?: No
13. W. Chen, X. Song, S.D. Beyea, C. Liu, R. D'Arcy & K. Rockwood. (2013). Changes of Functional Activation in the Prefrontal Lobe in Early Alzheimer's Disease during Memory Tasks – An ASL Perfusion fMRI Study at 4.0T. RSNA, Chicago, United States  
Main Audience: Researcher  
Invited?: No, Keynote?: No
14. (2012). Novel Techniques for Clinical & Pre-Clinical Imaging Evaluation of Therapeutic Efficacy. Dalhousie Department of Neuroanatomy Seminar Series, Halifax, Canada  
Main Audience: Researcher  
Invited?: Yes, Keynote?: No
15. (2012). High Field MRI Applications in Medical Physics. Annual Scientific Meeting of the Canadian Organization of Medical Physicists, Halifax, Canada  
Main Audience: Researcher  
Invited?: Yes, Keynote?: No
16. D. Holland, C. Liu, X. Song, R.C.N. D'Arcy, T.M. Stevens, A. Sederman, L. Gladden C.V. Bowen & S.D. Beyea. (2012). Compressed Sensing Reconstruction Improves Sensitivity of Variable Density Spiral fMRI. 18th Annual Meeting of International Society for Magnetic Resonance in Medicine, Cambridge, United Kingdom  
Main Audience: Researcher  
Invited?: No, Keynote?: No
17. R. D'Arcy & X. Song. (2012). FMRI Measures of White Matter Integrity. Ontario Brain Institute Symposium: Linking Neuroimaging with Clinical Evaluation, Toronto, Canada  
Main Audience: Researcher  
Invited?: Yes, Keynote?: No
18. (2012). Radiation Physics in Medical Imaging. BHCRI Cancer Workshop "Medical Imaging in Oncology: Clinical and Research Applications", Halifax, Canada  
Main Audience: Knowledge User  
Invited?: Yes, Keynote?: No

19. (2011). Techniques for Imaging Novel Therapeutics Using SPIO Nanoparticles. Institute for Research in Materials Annual Meeting, Halifax, NS, Canada  
Main Audience: Researcher  
Invited?: Yes, Keynote?: No
20. (2011). The Effect of K-Space Trajectory on fMRI Sensitivity. Tianjin Medical University, Tianjin, China  
Main Audience: Researcher  
Invited?: Yes, Keynote?: No

## Broadcast Interviews

2014/07/15 - 2014/07/15	Interview about the translational impact of my research on individual specific functional neuroimaging, Global Maritime News, Global
2014/07/11 - 2014/07/11	Interviewed about recently receiving \$2.9M in research funding toward my MRI technology research program, and the impact that this research can have internationally and locally, CTV Live at 5, CTV
2014/07/11 - 2014/07/11	Discussion on research in automated diagnostics using MRI data analysis algorithms, and how this research could one day impact the people of Nova Scotia, CBC Information Morning, CBC Radio 1
2014/03/07 - 2014/03/07	Discussion on MEG research, and the role that will be played in hosting the 19th International Conference on Biomagnetism in Halifax., Maritime Morning News, Global News
2012/03/13 - 2012/03/17	Brain Awareness Week, Live at 5, CTV Nova Scotia
2012/03/13 - 2012/03/13	Technology to Improve Neurosurgical Simulation (Done at the Discovery Science Centre as part of Brain Awareness Week), Breakfast Television, Global Halifax

## Text Interviews

2016/04/27	"Preclinical PET Scanner Released for Simultaneous PET/MRI in Existing MRI Systems", Press Release by Cubresa Inc. <a href="http://www.prweb.com/releases/cubresa/nupet/prweb13370405.htm">http://www.prweb.com/releases/cubresa/nupet/prweb13370405.htm</a>
2015/09/23	"Canadian research group inks MRI R&D deal with GE", AuntMinnie.com
2015/09/22	Research Collaboration with General Electric on Automated Imaging Technologies, Wall Street Journal
2015/07/01	Impact of MEG Research/Technology, Izaak Magazine
2015/05/14	My research was one of the labs featured in a cover article describing scientific research going on in the Halifax region, Halifax Magazine
2015/05/09	Story describing the clinical translation of a technology that I developed, along with my PhD student, on functional pre-surgical mapping, Chronicle Herald (front page of the newspaper in weekend edition)
2015/04/01	Interviewed about my research lab, and the impact that our imaging physics research is having internationally, Halifax Magazine
2015/03/04	Interviewed about my research in functional neuroimaging technologies as part of a feature article. My research was one of three technologies featured (others were from sites elsewhere in Canada)., Canadian Healthcare Technologies Magazine

2015/03/02	Feature article on surgical image guidance, in which my research was one of three technologies featured (others were from sites elsewhere in Canada), Canadian Healthcare Technology
2014/07/15	Interviewed by All Nova Scotia (subscriber business news) about the funding turn-around for my lab after the withdraw of NRC, AllNovaScotia.com
2014/07/11	Article about the recent \$2.9M award from the Atlantic Innovation Fund, and the impact it will have on imaging research in Atlantic Canada, Chronicle Herald newspaper
2014/04/16	"Cubresa Announces New Compact SPECT Scanner for Preclinical Imaging Research", Press Release by Cubresa Inc. <a href="http://www.prweb.com/releases/2014/04/prweb11757079.htm">http://www.prweb.com/releases/2014/04/prweb11757079.htm</a>
2013/12/01	"MRI Insider Exclusive" feature article on AuntMinnie.com (the largest online e-zine for medical imaging) called "4T fMRI sheds light on brain activity in early Alzheimer's", based on my lecture at the RSNA conference., AuntMinnie.com
2012/09/21	Medical Imaging Research in Halifax, <a href="http://www.entrevestor.com/">http://www.entrevestor.com/</a>

## Publications

### Journal Articles

1. \*S. Patterson, \*A. Rudiuk, A. Friedman, S. Beyea, T. Bardouille. (2017). Resting-state magnetoencephalography combined with machine learning accurately differentiates mild Alzheimer's disease from healthy aging at the individual level. Neuroimaging: Clinical.  
Submitted  
Refereed?: Yes
2. L. Petley, T. Bardouille, D. Chaisson, P. Eroese, S. Patterson, A. Newman, A. Omisade, and S. Beyea. (2017). Attentional Dysfunction and Recovery in Concussion: Effects on the P300m and Contingent Magnetic Variation. Brain Injury.  
Submitted  
Refereed?: Yes
3. \*J. Rioux, S. Beyea, C. Bowen. (2016). 3D single-point imaging with compressed sensing provides high temporal resolution R2\* mapping for in vivo pre-clinical applications. Magnetic Resonance Materials in Physics. epub ahead of print: 1-15.  
Published  
Refereed?: Yes
4. \*M.T. Stevens, T. Bardouille, G. Stroink, S. Boe, & S.D. Beyea. (2015). Fully Automated Quality Assurance and Localization of Volumetric MEG for Pre-Surgical Mapping. J. Neuroscience Methods. 266: 21-31.  
Published  
Refereed?: Yes, Open Access?: No
5. \*M.T. Stevens, D. Clarke, S. Walling, G. Stroink, S.D. Beyea & R.C.N. D'Arcy. (2015). Improving fMRI Reliability in Pre-Surgical Mapping for Brain Tumours. J. Neurol. Neurosurg. Psychiatry. 10.1136/jnnp-2015-31: 1-8.  
Published  
Refereed?: Yes
6. \*S.V. Krishna Murthy, M. MacLellan, S.D. Beyea, T. Bardouille. (2014). Faster and Improved 3-D Head Digitization in MEG using Kinect. Frontiers in Neuroscience. 8: 1-7.  
Published  
Refereed?: Yes, Open Access?: Yes

7. N. Zhang, \*X. Song, S.D. Beyea, R.C.N. D'Arcy, Y. Zhang, R. Bartha & K. Rockwood. (2014). Advances in High-Field Magnetic Resonance Spectroscopy in Alzheimer's Disease. *Current Alzheimer's Research*. 11(4): 367-388.  
Published  
Refereed?: Yes
8. \*J.R. Gawryluk, \*E.L Mazerolle, S.D. Beyea & R.C.N. D'Arcy. (2014). Functional MRI supports white matter involvement in the Symbol Digits Modalities Test. *Frontiers in Human Neuroscience*.  
Published  
Refereed?: Yes
9. H. Guo, \*X. Song, M. Schmidt, R. Vandorpe, Z. Yang, \*E. LeBlanc, J. Zhang, S.D. Beyea, Y. Zhang, K. Rockwood. (2014). A standard procedure for creating an MRI-based brain atrophy and lesion index (BALI) for the evaluation of whole brain health in aging and Alzheimer's disease. *J. Alzheimer's Disease*. 42(2): 691-703.  
Published  
Refereed?: Yes
10. Hong P, Boyd D, Beyea SD, Bezuhly M. (2013). Enhancement of bone consolidation in mandibular distraction osteogenesis: a contemporary review of experimental studies involving adjuvant therapies. *J Plast Reconstr Aesthet Surg*. 66(7)  
Published  
Refereed?: Yes, Open Access?: No
11. \*Stevens MT, D'Arcy RC, Stroink G, Clarke DB, Beyea SD. (2013). Thresholds in fMRI studies: reliable for single subjects?. *J Neurosci Methods*. 219(2): 312-323.  
Published  
Refereed?: Yes, Open Access?: No
12. \*Mazerolle EL, \*Gawryluk JR, Dillen KN, \*Patterson SA, \*Feindel KW, Beyea SD, \*Stevens MT, Newman AJ, Schmidt MH, D'Arcy RC. (2013). Sensitivity to white matter FMRI activation increases with field strength. *PLoS One*. 8(3)  
Published  
Refereed?: Yes, Open Access?: Yes
13. Holland DJ, \*Liu C, \*Song X, \*Mazerolle EL, \*Stevens MT, Sederman AJ, Gladden LF, D'Arcy RC, Bowen CV, Beyea SD. (2013). Compressed sensing reconstruction improves sensitivity of variable density spiral fMRI. *Magnetic Resonance in Medicine*. 70(6): 1634-43.  
Published  
Refereed?: Yes, Open Access?: No
14. Fraser LM, \*Stevens MT, Beyea SD, D'Arcy RC.(2012). White versus gray matter: fMRI hemodynamic responses show similar characteristics, but differ in peak amplitude. *BMC Neuroscience*. 13  
Published  
Refereed?: Yes, Open Access?: Yes
15. \*Bray JM , Filiaggi MJ , Bowen CV , Beyea SD. (2012). Degradation and drug release in calcium polyphosphate bioceramics: an MRI-based characterization.*Acta biomaterialia*. 8(10)  
Published  
Refereed?: Yes
16. \*Brewer KD , \*Rioux JA , Klassen M , Bowen CV , Beyea SD. (2012). Signal displacement in spiral-in acquisitions: simulations and implications for imaging in SFG regions.*Magnetic Resonance Imaging*. 30(6)  
Published  
Refereed?: Yes

17. \*Rioux JA , \*Brewer KD , Beyea SD , Bowen CV. (2012). Quantification of superparamagnetic iron oxide with large dynamic range using TurboSPI. *Journal of Magnetic Resonance*. 216  
Published  
Refereed?: Yes
18. \*McWhinney SR, \*Mazerolle EL, \*Gawryluk JR, Beyea SD, D'Arcy RC. (2012). Comparing gray and white matter fMRI activation using asymmetric spin echo spiral. *Journal of Neuroscience Methods*. 209(2)  
Published  
Refereed?: Yes, Open Access?: No
19. \*Gawryluk JR, D'Arcy RC, \*Mazerolle EL, \*Brewer KD, Beyea SD. (2011). Functional mapping in the corpus callosum: a 4T fMRI study of white matter. *NeuroImage*. 54(1)  
Published  
Refereed?: Yes
20. D'Arcy RC, \*Gawryluk JR, Beyea SD, \*Hajra SG, \*Feindel KW, Clarke DB. (2011). Tracking cognitive changes in new-onset epilepsy: functional imaging challenges. *Epilepsia*. 52: 43-46.  
Published  
Refereed?: Yes
21. W Chen, \*X Song, SD Beyea, RCN D'Arcy, Y. Zhang, K Rockwood. (2011). Advances of Perfusion Magnetic Resonance Imaging in Alzheimer's Disease. *Alzheimer's & Dementia*. 7(2): 185-196.  
Published  
Refereed?: Yes
22. \*Gawryluk JR, \*Mazerolle EL, \*Brewer KD, Beyea SD, D'Arcy RC. (2011). Investigation of fMRI activation in the internal capsule. *BMC neuroscience*. 12  
Published  
Refereed?: Yes, Open Access?: Yes

## Reports

1. S.D. Beyea, S. Clarke, J. Rioux, C.V. Bowen, \*S. Patterson. (2016). Technical Report: Milestone #1 Summary of Deliverables for "Push-Button Pi-RADS - Automated Classification of Multi-Parametric MRI using Machine Learning" Research Contract. 8. GE Healthcare.
2. S.D. Beyea, \*S. Patterson. (2016). Technical Report: Milestone #2 Summary of Deliverables for "Automated Algorithms for Pre-surgical fMRI" Research Contract". 7. GE Healthcare.
3. S.D. Beyea, S. Clarke, J. Rioux, C. Bowen, \*D. McAllindon. (2016). Technical Report: Milestone #1 Summary of Deliverables for "MRI Technologies for Quantification of Liver Fatty Acid Profile with Iron Deposition" Research Contract. 7. GE Healthcare.
4. S.D. Beyea, S. Clarke, J. Rioux, C. Bowen, \*D. McAllindon. (2016). Technical Report: Milestone #2 Summary of Deliverables for "MRI Technologies for Quantification of Liver Fatty Acid Profile with Iron Deposition" Research Contract. 7. GE Healthcare.
5. S.D. Beyea, S. Clarke, J. Rioux, C. Bowen, \*S. Patterson. (2016). Technical Report: Milestone #2 Summary of Deliverables for "Push-Button Pi-RADS - Automated Classification of Multi-Parametric MRI using Machine Learning" Research Contract. 7. GE Healthcare.
6. S.D. Beyea, \*S. Patterson. (2016). Technical Report: Milestone #1 Summary of Deliverables for "Automated Algorithms for Pre-surgical fMRI" Research Contract". 7. GE Healthcare.
7. T. Bardouille, \*Santosh Vema, \*J. Lincoln, S. Beyea. (2015). Technical Design Document for Head Digitization Product. 10. Elekta Instrument AB.
8. T. Bardouille, \*R. Bishop, M. Maclellan, S. Beyea. (2015). Product Planning Report for Language Lateralization Algorithm Product. 7. Elekta Instrument AB.

9. T. Bardouille, \*R. Bishop, M. Maclellan, S. Beyea. (2015). Technical Design Document for Language Lateralization Algorithm Product. 14. Elekta Instrument AB.
10. T. Bardouille, \*S. Vema, M. Maclellan, \*J. Lincoln, S. Beyea. (2015). Product Planning Report for Head Digitization Product. 7. Elekta Instrument AB.
11. S. Beyea. (2015). Summary Report for Resolution & Performance Verification of Pre-Clinical SPECT Instrument (Final Report for NSERC ENGAGE Plus). 12. Cubresa Inc.
12. S. Beyea. (2014). Summary Report for Pre-Clinical SPECT Instrument (Final Report for NSERC ENGAGE). 10. Cubresa Inc.
13. 55 co-authors from associated workshop. (2013). Challenges to the Hybrid Medical Imaging Industry in Canada (Group Consensus Report from NSERC sponsored workshop on Frontiers in Hybrid Medical Imaging). 14. University of Saskatchewan

## Conference Publications

1. C. O'Grady, S. Patterson, J. Rioux, A. Omisade, J. Hashmi, S.D. Beyea. (2017). An Application of Spectral Entropy for Studying fMRI Interpretability. 22nd Annual Meeting of the Organization for Human Brain Mapping, Vancouver, Canada  
Conference Date: 2017/6  
Abstract  
Accepted  
Refereed?: Yes, Invited?: No
2. S. McLeod, T. Bardouille, S.D. Beyea. (2017). Using Reliability to Provide Patient-Specific Processing of Neuroimaging Data. 22nd Annual Meeting of the Organization for Human Brain Mapping, Vancouver, Canada  
Conference Date: 2017/6  
Abstract  
Accepted  
Refereed?: Yes, Invited?: No
3. J.A. Rioux, N.J. Murtha, A. Mason, C.V. Bowen, S. Clarke, S.D. Beyea. (2017). Flexible Prospective Compressed Sensing Acceleration of Prostate DCE-MRI with Quantized CIRCUS. 25th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Honolulu, United States  
Conference Date: 2017/6  
Abstract  
Accepted  
Refereed?: Yes, Invited?: No
4. N.J. Murtha, J. Rioux, O. Marriott, C.V. Bowen, S. Clarke, S.D. Beyea. (2017). Simulation Reveals Evidence for Bias in Parameter Estimates for Compressed Sensing of Temporally Dynamic Systems. 25th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Honolulu, United States  
Conference Date: 2017/4  
Abstract  
Accepted  
Refereed?: Yes, Invited?: No
5. \*R. Bishop, G. Eskes, \*T. Stevens, \*C. O'Grady, S. Beyea, T. Bardouille. (2016). A Comparison of Pre-Surgical Language Paradigms between MEG and fMRI. 10th Annual Meeting of the Canadian Association for Neuroscience, Toronto, Canada  
Conference Date: 2016/5  
Abstract  
Published  
Refereed?: Yes, Invited?: No

6. \*A. Rudiuk, \*S. Patterson, S. Beyea, T. Bardouille. (2016). Application of Support Vector Machines to Functional Neuroimaging Data. 10th Annual Meeting of the Canadian Association for Neuroscience, Toronto, Canada  
Conference Date: 2016/5  
Abstract  
Published  
Refereed?: Yes, Invited?: No
7. \*T. Stevens, D. Clarke, G. Stroink, T. Bardouille, R. D'Arcy & S.D. Beyea. (2015). Automated and Individualized fMRI Processing for Pre-surgical Mapping: Comparison with MEG and Cortical Stimulation. 23rd Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Toronto, Canada  
Conference Date: 2015/5  
Abstract  
Published  
Refereed?: Yes, Invited?: No
8. \*T. Stevens, D. Clarke, G. Stroink, T. Bardouille, R. D'Arcy & S.D. Beyea. (2014). Optimizing fMRI and MEG for Pre-Surgical Mapping. 19th International Conference on Biomagnetism, Halifax,  
Conference Date: 2014/8  
Abstract  
Published  
Refereed?: Yes, Invited?: No
9. \*X. Song, \*M. Clarke, \*E. LeBlanc, T. Bardouille, J. Fisk, S. Darvesh, S.D. Beyea, R. D'Arcy and K. Rockwood. (2014). Changes in Pre-Frontal Activation in Early Alzheimer's Disease: An MEG Study. 19th International Conference on Biomagnetism,  
Conference Date: 2014/8  
Abstract  
Published  
Refereed?: Yes, Invited?: No
10. \*X. Song, \*M. Clarke, \*E. LeBlanc, T. Bardouille, J. Fisk, S. Darvesh, S.D. Beyea, R. D'Arcy, K. Rockwood. (2014). Increased Prefrontal Activation in Early Alzheimer's Disease during Memory Tasks: Preliminary Results from a Magnetoencephalography (MEG) Study. 20th Annual Meeting of the Organization for Human Brain Mapping, Hamburg, Germany  
Conference Date: 2014/6  
Abstract  
Published  
Refereed?: Yes, Invited?: No
11. T. Bardouille, \*T. Stevens, S. Boe , S.D. Beyea. (2014). Enhanced MEG Pre-Surgical Functional Mapping: Reliability & Spatiotemporal Clustering. 20th Annual Meeting of the Organization for Human Brain Mapping, Hamburg, Germany  
Conference Date: 2014/6  
Abstract  
Published  
Refereed?: Yes, Invited?: No
12. \*T. Stevens, T. Bardouille, D. Clarke, S.D. Beyea. (2014). Comparing fMRI and MEG for Language and Motor Mapping. 20th Annual Meeting of the Organization for Human Brain Mapping, Hamburg, Germany  
Conference Date: 2014/6  
Abstract  
Published  
Refereed?: Yes, Invited?: No



13. \*T. Stevens, D. Clarke, R. D'Arcy, G. Stroink & S.D. Beyea. (2014). A Novel Method for Robust Automated Thresholding for Pre-Surgical fMRI using a Single Functional Run. 22nd Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Milan, Italy  
Conference Date: 2014/5  
Abstract  
Published  
Refereed?: Yes, Invited?: No
14. Wei Chen, \*Xiaowei Song, \*Careesa Liu, Ryan D'Arcy, Steven Beyea & Kenneth Rockwood. (2013). Changes of functional activation in the prefrontal lobe in early Alzheimer's disease during memory tasks: An ASL- fMRI study at 4.0T. RSNA, Chicago, United States  
Conference Date: 2013/12  
Abstract  
Published  
Refereed?: Yes, Invited?: No
15. E. Gunde, \*M.T. Stevens, A. Omisade, \*X. Song, S.D. Beyea & R. D'Arcy. (2013). Linking Neuropsychology to Brain Imaging: Reliability of the Symbol Digit Modalities Test. 4th Annual Neuroinflammation Symposium, Toronto, Canada  
Conference Date: 2013/6  
Abstract  
Published  
Refereed?: Yes, Invited?: No
16. H. Guo, \*X. Song, Z. Sun, S. Beyea, J. Zhang, Y. Zhang, R. D'Arcy. (2013). White Matter fMRI in Alzheimer's Disease and Cognitively Healthy Aging: Preliminary Results from a Canada-China Joint Health Research Initiative Project. 6th Congress of the International Society of Vascular Behavioural and Cognitive Disorders, Toronto, Canada  
Conference Date: 2013/6  
Abstract  
Published  
Refereed?: Yes, Invited?: No
17. \*M.T. Stevens, T. Bardouille, R.C.N. D'Arcy, D. Clarke & S.D. Beyea. (2013). MEG and fMRI: Which is a Better Functional Localizer?. 21st Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Salt Lake City, United States  
Conference Date: 2013/5  
Abstract  
Published  
Refereed?: Yes, Invited?: No
18. \*M.T. Stevens, R.C.N. D'Arcy, D. Clarke & S.D. Beyea. (2013). Reliability of fMRI: Are Group Means Really Representative?. 21st Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Salt Lake City, United States  
Conference Date: 2013/5  
Abstract  
Published  
Refereed?: Yes, Invited?: No
19. D. Holland, \*C. Liu, \*X. Song, R.C.N. D'Arcy, \*T. Stevens, A. Sederman, L. Gladden, C.V. Bowen, S.D. Beyea. (2012). Compressed Sensing Reconstruction Improves Sensitivity of Variable Density Spiral fMRI. 18th Annual Meeting of International Society for Magnetic Resonance in Medicine British Chapter, Cambridge, United Kingdom  
Conference Date: 2012/9  
Abstract  
Published  
Refereed?: Yes, Invited?: No

20. \*JR Gawryluk, E Gunde, \*EL Mazerolle, SD Beyea, RCN D'Arcy. (2012). Exploring Clinical Value of the Symbol Digits Modalities Test in White Matter fMRI. MS Society of Canada Annual General Meeting, Toronto, Canada  
Conference Date: 2012/6  
Abstract  
Published  
Refereed?: Yes, Invited?: No
21. \*T Stevens, RCN D'Arcy, DB Clarke, SD Beyea. (2012). Using Reliability to Predict Validity in Clinical fMRI. 20th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Melbourne, Australia  
Conference Date: 2012/5  
Abstract  
Published  
Refereed?: Yes, Invited?: No
22. SD Beyea, D Holland, \*C Liu, \*X Xong, RCN D'Arcy, \*T Stevens, A Sederman, L Gladden, CV Bowen. (2012). Compressed Sensing Improves BOLD Sensitivity at Both the Individual & Group Levels. 20th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Melbourne, Australia  
Conference Date: 2012/5  
Abstract  
Published  
Refereed?: Yes, Invited?: No
23. \*T Stevens, RCN D'Arcy, DB Clarke, SD Beyea. (2012). Retrospective Registration for Improved Localization of Cortical Stimulation on MR Images. 20th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Melbourne, Australia  
Conference Date: 2012/5  
Abstract  
Published  
Refereed?: Yes, Invited?: No
24. \*T Stevens, RCN D'Arcy, DB Clarke, SD Beyea. (2012). Consistent Activation Across Trials & Field Strengths by ROC-reproducibility Thresholding. 20th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Melbourne, Australia  
Conference Date: 2012/5  
Abstract  
Published  
Refereed?: Yes, Invited?: No
25. \*S Patterson, \*E Mazerolle, SD Beyea, CV Bowen. (2012). Alternating Steady State pbSSFP permits and whole-brain fMRI from a Single Run of the Functional Paradigm. 20th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Melbourne, Australia  
Conference Date: 2012/5  
Abstract  
Published  
Refereed?: Yes, Invited?: No
26. \*JA Rioux, SD Beyea, CV Bowen. (2012). Compressed Sensing with Prior Information for Time-Resolved turboSPI. 20th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Melbourne, Australia  
Conference Date: 2010/5  
Abstract  
Published  
Refereed?: Yes, Invited?: No

27. \*X. Song, R.C.N. D'Arcy, J. Fisk, A. Major, S.D. Beyea & K. Rockwood. (2011). Correlations of Prefrontal Cortical Activation and Cognitive Performance with Cholinesterase Inhibitor Treatment: A High Field Functional MRI Study. International Conference on Alzheimer's Disease, Paris, France  
Conference Date: 2011/7  
Abstract  
Published  
Refereed?: Yes, Invited?: No
  
28. \*E.L., Mazerolle, \*K.D. Brewer, S.D. Beyea, \*J.R. Gawryluk, C.V. Bowen, \*D.R. DeBay, \*K.W. Feindel, \*J.R. Rioux, K. Semba, D. Rasmusson, R.C.N. D'Arcy. (2011). Hemodynamic changes in white matter during a breath-hold task do not result from partial volume effects: Implications for white matter fMRI. 17th Annual Meeting of the Organization of Human Brain Mapping, Quebec City, Canada  
Conference Date: 2011/6  
Abstract  
Published  
Refereed?: Yes, Invited?: No
  
29. \*J.R. Gawryluk, R.C.N. D'Arcy, S.D. Beyea. (2011). White matter fMRI: Linking advances in research with neuropsychological measures. 17th Annual Meeting of the Organization of Human Brain Mapping, Quebec City, Canada  
Conference Date: 2011/6  
Abstract  
Published  
Refereed?: Yes, Invited?: No
  
30. D Holland, \*C Liu, \*E Mazerolle, \*X Song, \*T Stevens, SV Bowen, A Sederman, L Gladden, SD Beyea. (2011). Compressed Sensing Reconstruction Improves Variable Density Spiral Functional MRI. 19th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Montreal, Canada  
Conference Date: 2011/5  
Abstract  
Published  
Refereed?: Yes, Invited?: No
  
31. \*S. Patterson, C.V. Bowen, S.D. Beyea. (2011). FMRI using high flip-angle alternating steady state balanced SSFP supported by Monte Carlo studies. 19th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Montreal, Canada  
Conference Date: 2011/5  
Abstract  
Published  
Refereed?: Yes, Invited?: No
  
32. D Holland, \*C Liu, \*E Mazerolle, \*X Song, \*T Stevens, CV Bowen, A Sederman, L Gladden, SD Beyea. (2011). Highly Sparse Spiral fMRI Reconstructed with Compressed Sensing: Trajectory Optimization for BOLD Contrast. 19th Scientific Meeting of the International Society for Magnetic Resonance n Medicine, Montreal, Canada  
Conference Date: 2011/5  
Abstract  
Published  
Refereed?: Yes, Invited?: No

## Intellectual Property

### Patents

1. Method and System for Head Digitization and Co-Registration of Medical Imaging Data. United States. U.S. Patent No. 14/815,306. 2015/07/07.  
Patent Status: Pending

### Licenses

1. A Method & Workflow for Automated MEG Data Quality Evaluation  
In Negotiation  
Filing Date: 2016/10/18  
Term sheet being negotiated between PI's institution and Elekta Instrument AB in Stockholm, Sweden. Company intends to use this to replace its existing technology, with the integration of our technology tentatively built into their product development roadmap.
2. Advancements in Pre-Clinical SPECT Technology & Applications  
Granted  
Date Issued: 2015/12  
Filing Date: 2015/12/01  
Royalties paid to institution based on gross sales by Cubresa Inc of their Pre-Clinical SPECT product. Rate not disclosed for business-confidential reasons. This company would not have been able to move forward with getting this product to-market and fully commercialized without the scientific and technical contributions from my lab.