



IWK Health Centre

Pediatric Vision Science  
Research Group

## An Eye on Research

Pediatric Vision Science Research Group Newsletter  
Issue 4 • Spring 2009

### PVSRG RESEARCH RETREAT

On October 20<sup>th</sup>, 2008 the PVSRG held an all-day Research Retreat. With more than thirty attendees, the Retreat was organized as a planning session focused on clearly defining the strengths of the group and how those strengths can be built upon to further our success and build a first-class research program in vision science. With excellent discussion facilitated by Mr. Wayne Marsh the group took a significant step forward and identified initiatives around: organizational structure; focusing research expertise; improving trainee research supports; developing strategic collaborations; and establishing a stable research infrastructure.

Since the Retreat we have established the PVSRG Steering Committee to spearhead the development of the group. Dr. François Tremblay, Eye Care Team electrophysiologist and member of the Retina & Optic Nerve Research Laboratory, is assuming the chair of the Committee for its first year and is joined by Dr. Paul Artes, Foundation Scholar in Glaucoma Research at the Dalhousie Department of Ophthalmology & Visual Sciences; Ms. Leah Walsh, Eye Care Team orthoptist and Mr. Steve Van Iderstine, PVSRG Research Associate.

One key initiative discussed at the Retreat was improvement of the research process for trainees in the group, including Clinical Vision Science M.Sc. candidates and Ophthalmology Residents and Fellows. Plans are underway to smooth things along for students in the areas of choosing a project, finding a supervisor, gaining REB approval and

preparing and defending a thesis. A working group has been formed to plan and implement these changes. The group consists of Mr. Erik Hahn, Eye Care Team Leader; Ms. Heather Fennell, Eye Care Team orthoptist; Dr. Gabriella Varhelyi, Clinical Vision Science Curriculum Coordinator; Ms. Leah Wood, second year CVS student and M.Sc. candidate and Mr. Steve Van Iderstine.

The PVSRG gratefully acknowledges the following for their generous support of the Retreat:

Dalhousie University Faculty of Health Professions, Faculty of Medicine, Department of Ophthalmology & Visual Sciences and the Capital District Health Authority.

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## RESEARCH ROUNDS

Another initiative over the past year has been to revive the practice of holding Research Rounds. These Rounds have been structured for 20 minute presentations by each of three speakers. Speakers are researchers from the group ranging across the spectrum from trainees in the Clinical Vision Science and Ophthalmology programs, to orthoptists and senior investigators. The goal of Research Rounds is to present projects at different stages of completion allowing for input from colleagues into early-stage projects and progress updates to the group as projects progress. This is also an excellent forum for discussion of potential next-step or spin-off projects. We have had lots of constructive discussion already and look forward to more in future sessions.

### Recent presenters

- Joan Parkinson
- Shannon MacDonald
- Bo-Ram Hong
- Karen McMain
- Leah Wood
- Andrea Skeet

## GUEST SPEAKER SERIES

One of the goals of the PVSRG is to produce world-class research that will have an impact on the vision science literature and ultimately impact vision care for the pediatric population. As part of this pursuit we have initiated a PVSRG Guest Speaker Series. Over the past year we have had presentations aimed at expanding our knowledge base in related fields of vision research and also in issues related to the processes of doing research.

**Bev White**, Research Ethics Board (REB) Coordinator & Information Officer at the IWK Research Services Office. Ms. White addressed the group on the involvement of the REB in the

research process at the IWK. After providing an overview of the REB process, Ms. White's presentation was quickly derailed by a barrage of questions from the audience. The result was a highly interactive and informative discussion with lots of participation from the audience. The session provided a wealth of practical information of great interest to all in attendance.

**KS Joseph** MD PhD, Professor, Depts. of Obstetrics and Gynaecology and Pediatrics at Dalhousie University. "Trial and Error – Interpretation of Clinical Trials" Dr. Joseph used a very effective question and answer presentation style to explore some of the key components of clinical trials. He identified key aspects of trial design and data analysis as areas for critical appraisal when assessing the value of a given trial. His comments have improved our ability to critically interpret published results and also made us mindful of critical aspects in the design of our own projects.

**Patricia McMullen** PhD, Professor, Department of Psychology at Dalhousie University. "Cognitive Neuroscience of the Cortical Visual System". Dr. McMullen gave an excellent overview of links between cognition and visual perception including a summary of the symptomatology of various pathological conditions related to this field. She then went on to discuss her own research in more detail, particularly in the areas of facial and object recognition.

**Holly Etchegary** PhD, Consulting Scientist, Interdisciplinary Research at the IWK Health Centre. "Grantsmanship – Tips for writing a successful grant" Dr. Etchegary used several of her own recent successful grant applications to provide real-life examples of the many hints and tips she provided for various aspects of the grant application process. She emphasized the importance of targeting an application to the funding body, building a research team with the right skill set, and beginning early to avoid the stresses and pitfalls of grant submission deadlines.

The PVSRG would like to sincerely thank all our guest speakers for taking the time to inform us and contribute to making us better researchers.

## RESEARCH MEETS EDUCATION

Students in the joint IWK Health Centre / Dalhousie University graduate program in Clinical Vision Science exit with a Graduate Diploma in Orthoptics and Ophthalmic Medical Technology. However, they also have the option to pursue a Masters of Science degree by undertaking a research thesis project. Since the Program's inception the curriculum has always included a research course, however CVS students in the past have relied on courses developed for other disciplines, such as nursing.

Thanks to the efforts of Dr. Gabriella Varhelyi, Professor and Curriculum Coordinator for the CVS Program, that has changed this year with the implementation of the course **VISC 5031.03 - Introduction to Research Theory and Practice for Vision Science**. The new course addresses the learning needs of clinical vision science students and is fully integrated with the educational concepts and purpose of the Program.



*Dr. Gabriella Varhelyi*

Dr. Varhelyi, in conjunction with Program Director Karen McMain, CVS Professor François Tremblay and guest lecturer Steve Van Iderstine, has developed the course for the program. She describes the course as "an up-to-date and hands-on learning experience of

the principles and practical aspects of scientific research".

The research course develops understanding of the major aspects and steps of practitioner

research in the process of knowledge development in clinical vision science. Students will gain foundational knowledge in research design and methods, including a decision-making framework for identifying research questions and choosing an appropriate research design. The class furthers research undertakings of graduates in their prospective professional careers as well.

Scope of human inquiry, methodologies of interpretative and critical investigation, sampling and data analysis by applying quantitative and qualitative inquiry techniques are discussed in the clinical vision sciences environment. Through lectures and assignments in qualitative and quantitative research, discussions about research ethics and other pertinent topics in clinical and basic science approaches, students acquire the specialized knowledge necessary to formulate a comprehensive research plan.

The development of a research plan and proposal for a topic of the students' own choosing is a key outcome of the course. The submitted proposals are evaluated by a peer committee and returned to the students with recommendations for further improvement. This serves as an excellent foundation for future research as it offers valuable resources for advancing the submitted research plans into thesis proposals to complete research towards a Master's degree and/or for applying them in clinical practice.

Since the course is compulsory for all students in the program, even those who do not pursue a M.Sc. degree will come away with an in-depth understanding and appreciation for the process of doing research.

Through this educational initiative the CVS program aims to improve the quality of research training for its students and have a real impact on the quality of research performed by the students as well as to produce well-rounded graduates with an appreciation for the ways in which research underpins a reflective and patient-oriented clinical practice.

## CELEBRATING SUCCESS

### Publications

- 1 Artes, PH. (2008). Progression: Things we need to remember but often forget to think about. *Optometry and Vision Science: Official Publication of the American Academy of Optometry*, 85(6), 380-385.
- 2 Chauhan, BC, DM Hutchison, PH Artes, J Caprioli, JB Jonas, RP LeBlanc, & MT Nicolela. (2009). Optic disc progression in glaucoma: Comparison of confocal scanning laser tomography to optic disc photographs in a prospective study. *Investigative Ophthalmology & Visual Science*, 50(4), 1682-1691.
- 3 Jiang, H, A Orr, DL Guernsey, J Robitaille, G Asselin, ME Samuels, & MP Dube. (2009). Application of homozygosity haplotype analysis to genetic mapping with high-density SNP genotype data. *PLoS ONE*, 4(4), e5280.
- 4 Lakosha, H, F Tremblay, & I DeBecker. (2009). High-voltage electric trauma to the eye. *Canadian Journal of Ophthalmology*, In Press.
- 5 McMain, K, K Blake, I Smith, J Johnson, E Wood, F Tremblay, & J Robitaille. (2008). Ocular features of CHARGE syndrome. *Journal of AAPOS : The Official Publication of the American Association for Pediatric Ophthalmology and Strabismus / American Association for Pediatric Ophthalmology and Strabismus*, 12(5), 460-465.
- 6 Robitaille, JM, K Wallace, B Zheng, MJ Beis, M Samuels, A Hoskin-Mott, & DL Guernsey. (2009). Phenotypic overlap of familial exudative vitreoretinopathy (FEVR) with persistent fetal vasculature (PFV) caused by FZD4 mutations in two distinct pedigrees. *Ophthalmic Genetics*, 30(1), 23-30.

### Thesis Defences

Congratulations to the following two Clinical Vision Science students who successfully defended their M.Sc. theses:

Maria Harvey – June 27<sup>th</sup>, 2008 - The effects of pictorial illusions on monocular and binocular grasping tasks – supervised by Dr. David Westwood

Vanessa Avellaneda Chevrier – November 4<sup>th</sup>, 2008 - Retino-Retinal Projection: Tracing Retinal Ganglion Cells Projecting to the Contralateral Retina – supervised by Dr. Balwantry Chauhan.

### Awards

Congratulations to Shannon MacDonald for receiving the highest Canadian Orthoptic Council certification exam scores at the 2008 Canadian Orthoptic Society meeting.



Shannon  
MacDonald

Leah Walsh, orthoptist at the Eye Care Team, won a poster prize at the XI International Orthoptic Congress, Antwerp, Belgium in May, 2008 for the poster "The Method of Treatment Cessation and Amblyopia Recurrence"



Nova Scotia Health Research Foundation (NSHRF) Student Research Awards

M.Sc. candidates from the Clinical Vision Science program have had excellent success in the two most recent NSHRF Student Research Award competitions.

Shannon MacDonald was successful in the 2008-2009 competition with her project "An evaluation of grasping in individuals with absent stereoacuity: Is there a binocular advantage?" Shannon is working with Dr. David Westwood of the Dalhousie School of Health and Human Performance to assess the impact of an absence of stereoacuity on the everyday task of reaching for, and grasping, an object. Shannon has now completed her data collection and analysis and is preparing for her thesis defence on June 17<sup>th</sup>.



*NSHRF Student Research Award recipients Leah Wood (left), Bo-Ram Hong (right) and Shannon MacDonald (pictured on p.4)*

Leah Wood and Bo-Ram Hong both had successful applications in the recently announced 2009-2010 Student Research Award competition.

Leah Wood is working with Dr. François Tremblay on a project entitled "The impact of anesthesia on neuronal activity: An *in situ* retinal model looking at isoflurane, propofol and N<sub>2</sub>O". Leah is pursuing her research using the new multi-electrode array in the Retina and Optic Nerve Research Laboratory on the 15<sup>th</sup> floor of the Tupper Building. Leah has spent the winter honing her skills in sample preparation and use of the equipment and is poised to collect her experimental data over the summer.

Bo-Ram Hong is interested in the possibility of subtle visual function deficits in children born prematurely and diagnosed with mild Retinopathy of Prematurity. She and her

supervisors, Dr. Johane Robitaille and Dr. Paul Artes, will examine school age children using automated kinetic perimetry and radial deformation acuity, among other tests. Bo-Ram and her team have received REB approval and were also successful in obtaining an IWK operating grant to fund the operational costs of the study.

## Grants

- 1 Maria Harvey, Dalhousie University Faculty of Graduate Studies Conference Travel Grant.
- 2 Leah Walsh, IWK Health Centre Conference Presentation Award.
- 3 Bo-Ram Hong, Johane Robitaille, Paul Artes, Michael Vincer & Leah Walsh. IWK Health Centre Category A operating grant. "Visual function in school-age children with a history of prematurity"
- 4 Shannon MacDonald, Dalhousie University Faculty of Graduate Studies Conference Travel Grant.
- 5 Leah Wood, Dalhousie University Faculty of Graduate Studies Conference Travel Grant.
- 6 François Tremblay, NSERC Discovery grant five year renewal "Determinants of retinal generators and modulation of retinal output signal"

## Posters & Presentations

- 1 Walsh, LA, EK Hahn, & GR LaRoche. The Method of Treatment Cessation and Amblyopia Recurrence. The XI International Orthoptic Congress, Antwerp, Belgium, May 2008.
- 2 Harvey MD, & DA Westwood. Effects of pictorial illusions on monocular and binocular prehension tasks. Electronic poster E-00030. COS Annual Meeting and Exhibition, Whistler, BC, June 11-14, 2008.
- 3 Rawlings N, AF Cruess, & PH Artes. Assessment of age-related macular

- degeneration with a radial deformation acuity chart. Poster A332. ARVO Annual Meeting, Fort Lauderdale FL, May 3-7, 2009.
- 4 Lodha N, B Ford, Y Shen, R Brennan, J Robitaille, R Koenekoop, F Tremblay, T Rosenberg, NT Bech-hansen, CSNB Study group. Phenotypic Variability in Genetically Defined X-linked Congenital
- 5 Artes PH, MT Nicolela, Y Agoumi, G Sharpe, BC Chauhan, & St Kitts Eye Study Group. The St Kitts Eye Study (SKES): Design and Initial Findings. Poster A336, ARVO Annual Meeting, Fort Lauderdale FL, May 3-7, 2009.

## CONFERENCES & MEETINGS

PVSRG members regularly present their research at various meetings & conferences. Below are some recent and upcoming events.

Date	Location	Event (PVSRG presenters)
April 20	Lord Nelson Hotel, Halifax	Dalhousie University Department of Ophthalmology & Visual Sciences Research Day (Presentations by Lori Bramwell, Joan Parkinson & Shannon MacDonald)
May 3 - 7	Fort Lauderdale, FL	The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting (Posters by Paul Artes, Johane Robitaille & François Tremblay)
June 20 - 23	Toronto, ON	Canadian Ophthalmological Society (COS) Annual Meeting (Presentations by Heather Fennell, Karen McMain, Joan Parkinson & Shannon MacDonald. Posters by Vanessa Avellaneda Chevrier & Leah Wood)

## PROJECTS UPDATE

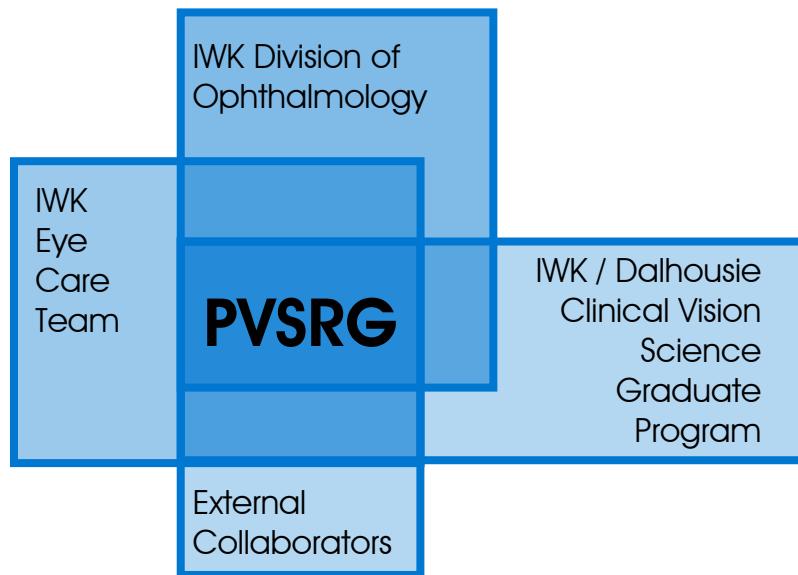
Investigator(s)	Study
Lori Bramwell & Robert LaRoche	Ocular Abnormalities in Autism <a href="#">\$</a>
Stephanie Dotchin & Robert LaRoche	Cross sectional analysis of vision screening program in Nova Scotia <a href="#">\$</a>
Hadil Eshtaya & Lesya Shuba	Visual field effects in long term migraine patients <a href="#">\$</a>
Bo-Ram Hong, Johane Robitaille & Paul Artes	Visual function in school-age children with a history of prematurity <a href="#">\$</a>

Investigator(s)	Study
Robert LaRoche & David Gaskin	Microscopy of the inferior oblique structure
Robert LaRoche & Leah Walsh	Chart review on results of inferior oblique myectomy in patients with superior oblique palsy
Shannon MacDonald & David Westwood	An evaluation of prehension in individuals with absent stereoacuity: Is there a binocular advantage? §
Sarah Mackinnon & Linda Dagi	Objective Measurement of Anatomical Fundus torsion §
Lesley MacSween & Patricia McMullen	Form-from-motion processing in the intact dorsal cortex §
Roxana Rivera & Robert LaRoche	Effect of Sevoflurane on the intraocular pressure §§
Johane Robitaille	Genetic analysis of Frizzled-4 (FZD4) and its influence on familial exudative vitreoretinopathy (ROP) and other associated retinal disorders
Johane Robitaille	National Retinoblastoma Strategy
Johane Robitaille	Genetic analysis and mutation effect on the variation of phenotype of autosomal dominant optic atrophy (ADOA)
Johane Robitaille	Genetic analysis and mutation effect on the variation of phenotype of Leber's Congenital Amaurosis
Johane Robitaille	Chart review- Patients with coloboma
Johane Robitaille	Genetic analysis and mutation effect on the variation of phenotype of congenital stationary night blindness
Johane Robitaille & François Tremblay	Clinical and genetic analysis of Presumed Pericentral Retinal Degeneration
Andrea Skeet & François Tremblay	An investigation of central vs. peripheral visual evoked potentials in amblyopia §
François Tremblay	Anthocyanins in the light-induced retinopathy rat
François Tremblay	Modeling of the ON and OFF interactions of the photopic ERG oscillatory potentials
François Tremblay	Stem cell retinal rescue
François Tremblay	Optic nerve damage in pigs
François Tremblay	NCKX2 mice ERGs
François Tremblay & Joan Parkinson	The effect of stimulus masking on pattern visual evoked potential and pattern electroretinogram
Leah Wood & François Tremblay	The impact of anesthesia on neuronal activity: an ex vivo retinal model looking at isoflurane, propofol and nitrous oxide §

§ Clinical Vision Science MSc thesis project

§§ Ophthalmology Resident or Fellow research project

### PVSRG Membership Composition



#### CONTACT US

If you have comments on this newsletter, or if you would like more information about the PVSRG, please contact:

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