7th Canadian University Conference in Optometry

BY ETTY BITTON, OD, MSc, FAAO

Every few years, faculty and students from the two Canadian optometry schools get together to share knowledge, network and visit each others schools as a way to stay connected. The École d'optométrie at the Université de Montréal (UM) was this year's host for the 7th Canadian University Conference in Optometry held in December 2010 in Montreal. The first of such exchanges occurred back in 1988 in Montreal. Opening statements were made from both, Dr. Jacques Gresset, Director of UM and Dr. Thomas Freddo, Director at the time, of the School of Optometry, University of Waterloo (UW). Over 200 attendees, comprised of optometry students, graduate students, clinicians and faculty were on hand to interact and share in this special event.

The Montreal-Waterloo Connection

The two schools have been intimately linked over the years, not only by the fact that they are the only two optometry programs in Canada but that many of the faculty have ties to both institutions. To date, nine people have had ties to both institutions in some form or other.

Dr. Jacob Sivak was a graduate of UM where he completed his optometry training. He later joined Waterloo as faculty and progressed to the rank of Director of the school (1984-1990 and 1993-1996) and as Dean of the Faculty of Science (1999 to 2002). In November 2000, he was honored by UM with an *honoris causa* for his numerous contributions to visual science. Dr. Sivak has maintained a very active research laboratory and remains on faculty at Waterloo as professor emeritus.

Dr. John V. Lovasik, optometry graduate of Waterloo, remained in Waterloo for several years completing graduate degrees and then joining the faculty. Dr. Lovasik then moved to Montreal, to become the Director of the UM school (1989-1995). Dr. Lovasik remains on faculty at the Montreal school as a full professor.

Dr. Angela Kothe received her optometry degree from Waterloo. She continued her studies towards a graduate degree under the supervision of Dr. Lovasik at UW. She later joined the faculty at UM from 1988-1995 and was responsible for revamping the ocular disease section of the curriculum. Dr. Kothe is presently working in industry.

Dr. Hélène Kergoat obtained her optometry degree from UM. After several years of practice she decided to further her education by enrolling for graduate studies, which she completed at Waterloo, under the supervision of Dr. Lovasik. Dr. Kergoat then moved back to Montreal where she has joined the faculty and maintains an active clinical research profile as a full professor.

Dr. Pierre Simonet, graduated from UM, and later completed graduate studies in optics at Waterloo under the supervision of Dr. Melanie Campbell. He returned to Montreal as a professor and led the school as Director from 1996-2003. Dr. Simonet then progressed to the University's administration as Director of Planning (2003-2005) and then as vice-provost of the University from 2005 to 2010.

Dr. Etty Bitton, graduated from Waterloo in 1988, and returned to Montreal to practice. After a graduate degree from UM under the supervision of Dr. Lovasik, she then joined the faculty full time. She returned to Waterloo for sabbatical leave where she collaborated with UW faculty on different projects related to the tear film. Dr. Bitton remains on faculty at UM as an associate professor and as Director of the Externship Program.

Dr. Daniel Boissy, graduated from UW in 1989, and came back to Montreal to join his father's practice on the outskirts of Montreal. Dr. Boissy is also a lecturer at the UM, involved in the contact lens laboratory as well as a clinician in the primary care clinic.

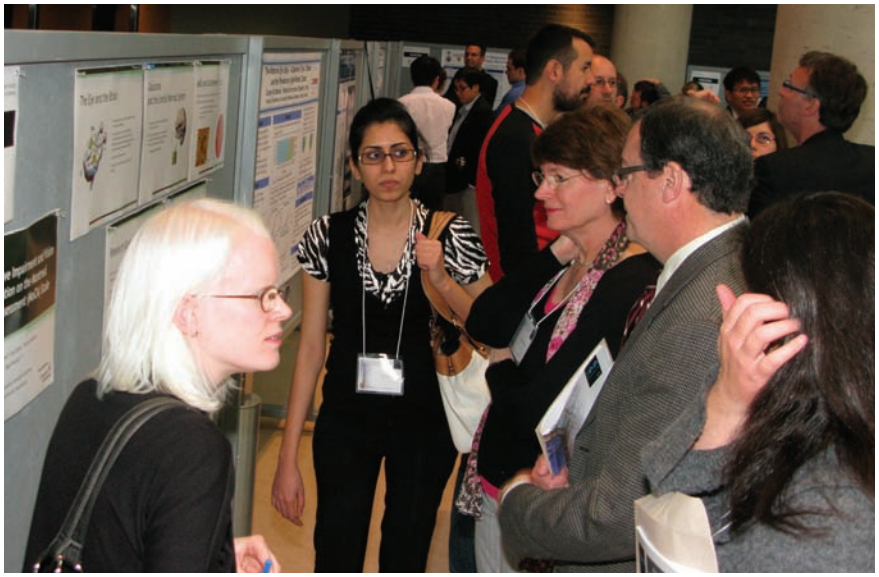
Dr. Sharon Wong completed her graduate degree under the supervision of the Dr. Jacob Sivak at UW. Inspired by the possibility of coupling basic research with clinical applications, she enrolled for her optometry degree at UM. Soon after graduation, Dr. Wong moved to British Columbia where she is presently practicing.

Dr. Thomas Freddo, Director, from 2006 to 2011, of the School of Optometry at UW, was honored at the graduation ceremonies in 2010, with a *honoris causa* from UM for his numerous contributions in the biochemical, histological and vascular mechanisms of aqueous outflow.

It is easy to appreciate how the aforementioned individuals have been intimately linked to both institutions and that they will continue to promote the merits of both Canadian optometry schools. These meetings continue to foster and strengthen the close relationship between the two institutions now and into the future. Who will be next to travel between the two institutions and benefit from what both have to offer?

Highlights from the 7th Conference

Keynote speakers from both institutions highlighted some of their basic and clinical research in their respective fields. Here is a summary of the lectures that each presented.



Poster session allowing UW and UM attendees to interact.

Insights from Darkness: The anatomy of blindness

Maurice Ptito, PhD, FAAO
Professor, UM

Visual deprivation from birth leads to an anatomical reorganization of the brain that is training-induced. Using behavioral techniques, we were able to show that congenitally blind individuals are able to process visual stimuli through the somatosensory system. To do so, they recruit their visual cortex and its efferent visual streams (ventral and dorsal). Using brain imaging techniques, we were able to demonstrate that the blind's brain undergoes massive anatomical and metabolic changes that culminate in the reorganization of the somatotopy of both the tongue and the fingers. Dr. Ptito's lecture provided insight on the anatomical pathways used to reach the visual cortex in the total absence of visual inputs.

CSEye Waterloo: The trials and tribulations of a Forensic Optometrist

Graham Strong, OD, MSc
Professor, UW

Homicide detectives discover a twisted pair of eyeglasses beneath the body at a crime scene. They are anxious to learn whether the spectacles belong to the victim, to the victim's killer, to a potential witness, or to someone who is totally unconnected with the homicide but who inadvertently lost his glasses at a location that turned into a crime scene. UW Optometry professor Graham Strong is periodically consulted to help solve such cases by analyzing ophthalmic evidence, that surfaces during the ensuing investigation and prosecution. Dr. Strong described to the attendees the curious science of "forensic optometry" with specific reference to several challenging homicide cases that he's helped solve over the past twenty years.

Neurovascular coupling in the human retina

John Lovasik, OD, PhD, FAAO
Professor, UM

The "Neuro Vascular Coupling" (NVC) is the physiological phenomenon wherein neural activation elicits increased blood flow in the target tissue to support the increase in metabolism.

At the retinal level, metabolic and pressure autoregulatory mechanisms modulate blood flow through vasoconstriction or vasodilation. Regulatory changes in vessel caliber can now be measured precisely in real time and in vivo with a Retinal Vessel Analyzer (Imedos).

Dr. Lovasik described his studies on blood flow regulation in the choroidal and retinal vasculatures, as well as NVC in the capillaries perfusing the optic nerve head. Dr. Lovasik concluded his presentation by highlighting the clinical implications of these studies and relevance to optometric practice.

Finding the causes and means of preventing myopia: Nature vs. nurture

Jacob Sivak, LScO, PhD, OD, FAAO
Professor, UW

The history of the search for the causes and means of preventing myopia is long and controversial. It is a problem that has attracted considerable attention for almost two hundred years because of the elevated and growing incidence of myopia and its progressive nature among children. The possible relationship between near work and myopia was postulated at least as far back as the mid-eighteen

Keynote Speakers

Maurice Ptito
PhD, FAAO, Professor, UM

Graham Strong
OD, MSc, Professor, UW

John Lovasik
OD, PhD, FAAO, Professor, UM

Jacob Sivak
LScO, PhD, OD, FAAO, Professor, UW

Lyndon Jones
PhD, FCOptom, FAAO (Dip CL)
Professor, UW

Olga Overbury
PhD, Associate Professor, UM

Natalie Hutchings, PhD, MCOptom,
Assistant Professor, UW

Jean-François Bouchard,
PhD, Associate Professor, UM

hundreds by Donders and Helmholtz. However, disagreement as to the relative importance of genetics versus the environment characterized much of the discussion on myopia for most of the twentieth century. The role of the environment has been emphasized during the past 30 years by the development of several animal models of refractive error development. Nevertheless, in spite of repeated and even more thorough and sophisticated efforts, including a recent multi-center evaluation of the possible use of progressive addition lenses for children, researchers have failed to establish a clear and unambiguous connection between excessive accommodation and the development of myopia. Dr. Sivak's presentation discussed historical and current research on the development of myopia in children which has focused on the roles of outdoor activity, parental myopia, esophoria, lag of accommodation as well as on the possible use of cycloplegic drugs.

Will Contact Lenses Still Exist in 2020?

Lyndon Jones, PhD, FCOptom, FAAO (Dip CL), Professor, UW

Despite tremendous developments in contact lens materials and care systems over the past 20 years, many patients still struggle to find long-lasting comfort with their lenses. So will practitioners continue to fit lenses over the next 10 years, as developments in spectacle technology and refractive surgery continue? Will the optical practice of 2020 bother to recommend contacts to patients? Dr. Jones reviewed the latest research on contact lenses and offered a look into the future to see what the contact lenses of 2020 will offer to patients.

Barriers to vision rehabilitation: The Montreal story

Olga Overbury, PhD
Associate Professor, UM

A significant number of visually impaired people who are eligible for and in need of rehabilitation services never receive them. The Montreal Barriers Study is an ongoing multi-center effort to build a database that will help to identify the factors that might keep people with low vision from obtaining the assistive devices and intervention that they need to optimize their visual function. To date, over 700 individuals have been enrolled in the study. Their demographic and psychological characteristics will be discussed in relation to their utilization of low vision services. These characteristics were discussed in the framework of referral patterns on the part of eye-care professionals and the decision-making process on the part of visually impaired people.

Adaptation and satisfaction with progressive addition lenses

Natalie Hutchings, PhD, MCOptom Assistant Professor, UW

Progressive addition lenses (PALs) are a popular form of correction in the presbyopic population, yet we know little about the wearers experience of the performance of a lens and how this relates to the lens design. The technology for designing and manufacturing these lenses has advanced very rapidly with the result that a plethora of 'personalized' lenses are now available purporting to select the design based upon the wearers visual behavior or lifestyle or ocular aberrations profile. However, the design characteristics are primarily theoretical constructs and developing our knowledge of how these lenses perform subjectively can determine if there are real benefits to personalization and/or selecting an appropriate design for an individual wearer. Dr. Hutchings presented findings from a variety of experiments designed to understand the change in eye and head movements during adaptation by naïve progressive addition lens wearers, and also the subjective experience corresponding to a variety of different lens design philosophies. Adaptation to PALs appeared to take more than 4 weeks to complete for the group examined (n=10). During adaptation, a greater number of head movements were recruited by the group overall, and this was most evident when carrying out a reading task. However, this finding was not different between the two lens types examined[1], but is consistent with the literature that suggests that head movements are more likely to be recruited when the trajectory to the next stimulus is known, such as it would be in reading. In terms of satisfaction, task related comfort appeared to improve with increased lens personalization. Also, subjective evaluations, analyzed using regression tree analysis, were able to discriminate between those

subjects who were 'happy overall', 'unhappy overall' and 'neutral' with their perceived performance with different personalized lenses. Although the factors and the relative rating of the factors were different between design philosophies, the future challenge will be to associate the specific design characteristics that impact these factors and their rating.

Hardwiring of the neurovisual system: Role of cannabinoids during development

Jean-François Bouchard,
B. Pharm, PhD
Associate Professor, UM

Vision is one of the most important senses that we possess. Social and economical costs associated with the absence, or the loss, of visual capacities are astronomical. There are several causes of neurovisual deficiencies; they could be congenital (optic nerve hypoplasia or atrophia), post-trauma, degenerative (macular degeneration) or secondary to other pathologies (glaucoma, diabetes, etc). Presently, there is no cure for these pathologies. Therefore, the identification of the mediators implicated in visual axon guidance and synaptogenesis is a valuable venue for developing new therapeutic agents to treat these incurable diseases. In the adult brain, endocannabinoids (eCBs) exert an important neuromodulatory function by acting as retrograde messengers to regulate the function of many synapses. Increasing evidence implicate eCBs and their receptors in several developmental events, such as cell proliferation and migration, axon guidance and synaptogenesis.

UM honors Dr. Des Fonn and the CCLR for their numerous contributions to CL education.

Dr. Bouchard presented how eCBs affect Retinal Ganglion Cell (RGC) axon guidance and synaptogenesis. The study of the mediators implicated during the neurovisual development will bring us to the identification of new pharmacological targets aiming at the regeneration and the reconstruction of visual pathways.

A special recognition

Over more than a decade now, the Center for Contact Lens Research (CCLR) has contributed to the advancement of contact lens (CL) research and education and has attained worldwide recognition for their numerous publications. UM presented a plaque to honour the Director of the CCLR, Dr. Desmond Fonn, as well as the CCLR for their numerous contributions to CL research and education, and to Canadian optometry. Dr. Freddo and Dr. Jones were on hand to receive the plaque on behalf of Dr. Fonn who could not attend the meeting.

Scientific presentations

Poster sessions were also a highlight of the program featuring both basic and clinical research from optometry students, graduate students and professors from both institutions. Table 1 summarizes the posters presented at the conference.

Judges, working in teams of two from UM and UW, had a chance to question each presenter about their respective research, and at the end of the day, two winners were identified. The winner of the

optometry student/master student category for best poster was Bruno Cécyre from UM for their presentation entitled "Endocannabinoids modulate axon guidance and target selection during visual system development" authored by B. Cécyre, G. Duff, A. Argaw, N. Tea and Jean-François Bouchard.

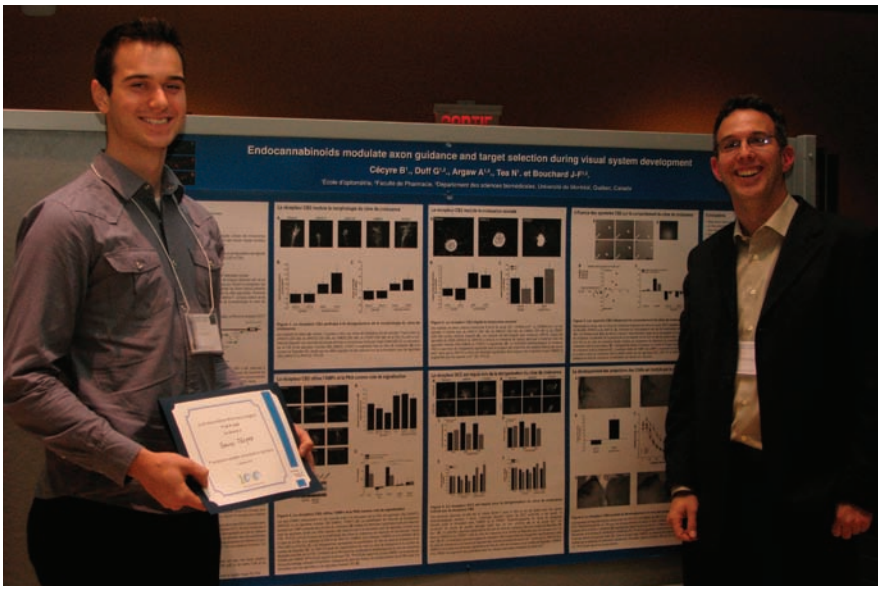
The presentation entitled "The impact of tear film components on in vitro lipid uptake to silicone hydrogel and hydrogel contact lens materials" authored by Holly Lorentz, Miriam Heynen and Lyndon Jones from UW, was the winner of the PhD/post-doc student category.

Other activities

UM optometry student ambassadors were on hand the visit of the optometry school on the second day of the conference, which included a visit of the clinic, the pre-clinic, library, student lounges and research labs.

Attendees were able to interact throughout the event, during the lectures, poster sessions and meals. One of the evenings highlighted the sounds of the 'Lost Faculties', a band comprised of several UW faculty members. The lead singers of the group were keynote speakers at the meeting, showing the diverse talents of optometry faculty! Socializing during these "off-hours" at events, brought people together and created memories. Of course, none of this would be possible without the work of dedicated individuals who were instrumental in the organization of the meeting. Thank you to all those that attended and contributed to the success of the meeting as well as UM for hosting the 7th Canadian University Conference in Optometry. We look forward to the next meeting, in Waterloo, in a few years.

Dr. Gresset, Director of UM presents the best poster award to Master student M. Bruno Cécyre from UM.



UM Bruno Cécyre with his Graduate studies supervisor, Dr. Jean-François Bouchard in front of the winning poster.

Poster Session
Optics/Pediatrics/Binocular Vision/Geriatrics/Visual impairment

Resistance to heat of new generation anti-reflective coatings
Yves Michaud, Francis Néron-Gaudreault, Benoît Frenette

Bifocals in children with Down Syndrome (BIDS) with early literacy and reading skills
Krithika Nandakumar, Susan J. Leat

Comparison of three acuity charts in subjects with unilateral amblyopia
Kathrine Gaboury, Marie-Ève Simard, Marie-Ève Corbeil, Danielle de Guise

Correlation between the Cambridge color vision test and the Holmes-Wright lantern
Jeff Hovis, Nelda Milburn

Stereoscopic deficit in children with microstrabismus: Does the suppression scotoma play a role ?
Mariline Pageau, Dave Saint-Amour, Danielle de Guise

How optometrists modify the subjective refraction when prescribing spectacles
Patricia K. Hrynchak, Andrea M. Mittelstaedt, Joel D. Harris, Carolyn Machan, Elisabeth L. Irving

Correlates of subjective quality of life of older adults with visual impairment
Judith Renaud, Marie-José Durand, Olga Overbury

Reading additions for children and young adults with low vision-effect on reading performance
Balsam Alabdulkader, Susan Leat

Performing complex cognitive tasks induce more postural instability for older people
Jean-Marie Hanssens, Philippe Turpin-Lavallée, Roshan Soowamber, Jocelyn Faubert

Effect of phoria and refractive error on vergeance adaptation to plus and minus adds in children
Vidhyapriya Sreenivasan, Elizabeth L. Irving, William R. Bobier

Vision in the global evaluation of the frail elderly individual hospitalized following a fall
Hélène Kergoat, Tanguy Boutin, Marie-Jeanne Kergoat, Judith Latour, Fadi Massoud

Prevalence of binocular vision and oculomotor anomalies in the elderly
Susan J. Leat, Priya Maharaj, Lisa Chan, Patricia K. Hrynchak, Andrea Mittelstaedt, Carolyn M. Machan, Elizabeth Irving

No cross-frequency facilitation for old observers
Rémy Allard, Judith Renaud, Jocelyn Faubert

Characteristics of saccades and pursuits in down syndrome
Raiju J. Babu, Krithika Nandakumar, Linda Lillakas, Susan J. Leat, Elizabeth L. Irving

Correlation of vision loss and mild cognitive impairment as found on the Montreal Cognitive Assessment (MoCA) scale
Nathalie Duponsel, Walter Wittich, Sara Dubuc, Olga Overbury

Cataract prelavence and type 2 diabetes: Waterloo eye study
Carolyn M. Machan, Patricia K. Hrynchak, Elisabeth L. Irving

Neural correlates of tactile maze solving in congenitally blind subjects
Léa Gagnon, Fabien Schneider, Ron Kupers, Hartwig Siebner, Olaf Paulson, Maurice Ptito

Measurement of normal sensory dominance
Peng Zhang, William R. Bobier, Trefford Simpson, Ben Thompson, Robert F. Hess

Congenital blindness does not seem to benefit olfactory localisation
Mylène Blanchette, Ron Kupers, Louise Baruël-Johansen, Maurice Ptito

Blood flow/Glaucoma

The optic nerve micro-capillaries blood oxygenation mechanisms in correlation with systemic arterial blood oxygenation
Pierre-Jean Bernard, Valentina Vucea, Vasile Diaconu

Response of human optic nerve head glia to biomechanical strain
John G. Flanagan, Ronan Rogers, Moyez Dharsee, Suzanne Ackloo

Retinal vessel pulsations in normals and runners
Hélène Kergoat, John V. Lovasik, Marie-Jeanne Kergoat, Normand Racine, Mireille Parent

Blood oxygenation measurements by multi-channel reflectometry on the venous and arterial structures of the retina
Valentina Vucea, Pierre-Jean Bernard, Van Loc Tran, Vasile Diaconu

Public Health/Optometric Education

Optimizing the frequency of routine eye exams
Elisabeth L. Irving , Joel D. Harris, Patricia K. Hrynchak, Susan J. Leat, Carolyn M. Machan, Andrea M. Mittelstaedt, Barbara E. Robinson

Evidence-based tool to train educators in multiple-choice question writing in resource-limited settings: A pilot study
Julie Brûlé, Benoît Tousignant

International optometric bridging program: The correlation between prior learning assessment and canadian standard assessment in optometry outcomes
Susan Cooper, Thomas Freddo

Institutional and gender differences in student indebtedness attending Canadian optometry schools
Catherine Gemme, Amélie St-Jean, Etty Bitton, Deborah Jones

Contact Lens/Cornea/Tear film

Fitting and effective power of a soft lens in a piggyback system
Daniel Brazeau

Novel contact lens materials for ciprofloxacin drug delivery
Alex Hui, Andrea Weeks, Heather Sheardown, Lyndon Jones

The impact of tear film components on in vitro lipid uptake to silicone hydrogel and hydrogel contact lens materials
Holly Lorentz, Miriam Heynen, Lyndon W. Jones

The relationship between corneal fluorecein staining and corneal infiltrates with a change in lens care product in North American soft CL wearers
Luigina Sorbara, Lynn G. Mitchell, Kathryn L. Richdale, Timothy T. McMahon, Meredith E. Jansen, Beth T. Kinoshita, Dawn Y. Lam, Heidi Wagner, Robin Chalmers

Use of a silicone hydrogel lens as the carrier in a piggyback system for the management of corneal irregularity after traumatic ruptured globe with corneal laceration
Nadia Marie Quesnel, Frédéric Morin, Amélie Poirier

In vitro bulk dehydration rates of hydrogel and silicone hydrogel daily disposable and frequent replacement CL materials
Rebecca Jones, Lyndon Jones

Lipid deposition on senofilcon A silicone hydrogel CL disinfected with 1-step hydrogen peroxide and Polyquad and Aldox preserved care regimens
Miriam Heynen, Holly Lorentz, Kathy Dumbleton, Jalaiah Varikooty, Craig Woods, Lyndon Jones

Effect of tear lubricants on tear ferning patterns in dry eye patients
Etty Bitton, Elior Sandroussy, Maxime Théroux-Soucy

Ex vivo and in vitro investigation of diagnostic dyes fluorescein and lissamine green on human corneal epithelial cells
Daniel J Cira, Rachael C Peterson, Christopher Amos, Craig A Woods, Desmond Fonn, Maud B Gorbet

Endothelial cell density recorded in the central and sub-incisional areas before and after cataract extraction with phacoemulsification
Claude J. Giasson, Leon D. Solomon, Audrey Carincotte, Xavier Feuillet, Cécile Maier, Miguel Chagnon

Ocular surface sampling techniques
Sruthi Srinivasan, Elizabeth Martell, Miriam Heynen, Doerte Luensmann, Daniel Cira, Maud Gorbet, Lyndon Jones

Clinical signs, tear lipocalin and lysozyme concentrations in post-menopausal women symptomatic of dry eye
Sruthi Srinivasan, Elizabeth Martell, Miriam Heynen, Lyndon Jones

A rapid method for the extraction of total mucin from hydrogel contact lenses
Elizabeth Martell, Adam Keech, Michelle Senchyma, Lyndon Jones

Neurophysiology

Cannabinoids modulate synaptogenesis via their CB1 receptors (CB1R)
Pascal Fleury, Sara Hamzeh, Alexandre Roy-Noël, Jean-François Bouchard

Distribution of the cannabinoid receptor CB_1 (CB_1R) and fatty acid amide hydrolase (FAAH) in the monkey retina
Joseph Bouskila, Mark Burke, Jean-François Bouchard, Maurice Ptito

Cortical functions of adult mice lacking CB_1 cannabinoid receptor revealed by optical imaging
Reza Abbas Farishta, Céline Robert, Mathieu Vanni, Samuel Bélanger, Karine Minville, Jean-François Bouchard, Christian Casanova

Densities of bovine ocular components
Xiao Su, Christina Vesco, Jacquelyn Fleming, Vivian Choh

Role of GPR55 in the development of the neurovisual system
Hosni Cherif, Alexandre Talbot, Jean-Francois Bouchard

Endocannabinoids modulate axon guidance and target selection during visual system development
Bruno Cécyre, Gabriel Duff, Anteneh Argaw, Nicolas Tea, Jean-Francois Bouchard

Retinal functionnal imaging: Intrinsic response characteristics
Laurent Bussières, Mathieu Vanni, Christian Casanova

Axonal varicosities density as an index of local neuronal interactions
Zi-Wei Zhang, Jun Il Kang, Elvire Vaucher

Topical administration of kinin B_1 receptor antagonist FV-60135-02 inhibits retinal inflammation in streptozotocin-diabetic rats
Mylène Pouliot, Sébastien Talbot, Didier Pruneau, Réjean Couture, Elvire Vaucher

A closer look at pattern motion selectivity in human area MT+: contribution of areas MT and MST
Martin Y. Villeneuve, Ben Thompson, Robert F. Hess, Christian Casanova

Functional organization of the primary and secondary visual cortex the tree shrew by optical brain imaging
Matthieu Vanni, Martin Villeneuve, Karine Minville, Heywood Petry, Martha Bickford, Christian Casanova

Visual deprivation from birth leads to increased thermal sensitivity
Hocine Slimani, Ron Kupers, Maurice Ptito

Visual training paired with electrical stimulation of the basal forebrain induces long-term increase in neuronal reactivity of the rat primary visual cortex
Marianne Groleau, Jun Il Kang, Annie Tang, Lodz Timmer, Florence Dotigny, Christian Casanova, Elvire Vaucher