Poster Program
Programme des affiches

5th NEW BRUNSWICK HEALTH RESEARCH CONFERENCE

5e CONGRÈS ANNUEL SUR LA RECHERCHE EN SANTÉ DU NOUVEAU-BRUNSWICK

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Title of the research project - Titre du projet de recherche
Lasso-Peptoids as Potent and Selective HDAC inhibition

Poster presenter - Nom de la personne qui présentera l'affiche
Adrian Culf

Researchers involved in this project - Chercheurs participant au projet
Culf, Adrian; Cuperlovic-Culf, Miroslava; Lloyd, Vett.

Abstract - Résumé
The eleven zinc-centred histone deacetylase (HDAC) isoenzymes have emerged as targets for epigenetic cancer therapy with HDAC inhibitors possessing structural similarity to the N-acetyl-lysine natural substrate. A bacterial cyclic peptide with this motif, romidepsin, is an approved treatment for cancer (lymphoma) and displays tight binding in the low nanomolar range. We present the current status of our work in the areas of automated peptoid synthesis (N-substituted glycine oligomer), head-to-tail macrolactamization for 9 to 15 atom rings, lead identification, molecular modelling, in vitro recombinant enzymatic and cellular activity of hydroxamate and thiol lasso cyclopeptoids. Funding is kindly provided by CBCF and NBHRF.
Title of the research project - Titre du projet de recherche
Emerging patterns in beverage consumption among New Brunswick students: alcohol and energy drinks

Poster presenter - Nom de la personne qui présentera l'affiche
Wang, Hao

Researchers involved in this project - Chercheurs participant au projet
Gupta, Neeru; Collette, Maurice.

Abstract - Résumé
Objective: Caffeinated energy drinks are increasingly popular among youth, and are also receiving increasing attention as a public health concern. This study looks at new measures of beverage consumption among middle- and high-school students in New Brunswick to build the evidence base, inform policy options and raise public awareness. Methods: Data from the New Brunswick Student Drug Use Survey (NBSDUS) are used in this research. The NBSUDS is an anonymous, self-administered survey among students in the public middle- and high-school system. The 2012 survey round collected information on use of alcohol, caffeinated energy drinks and other substances from a representative sample of 3507 students. Energy drinks was a new domain of inquiry in 2012. Population-weighted estimates of those using alcohol and those using energy drinks, disaggregated by background characteristics, are used to profile beverage consumption among students. Results: Preliminary results show that consumption of alcohol and energy drinks is widespread among New Brunswick students: 48% and 57% past-year prevalence rates, respectively. Consumption profiles differ by gender and grade. Further analysis will probe into converging and diverging patterns in beverage consumption among the target population. Implications of findings: Previous lack of timely estimates of the health burden of caffeinated energy drinks have hindered formulation of evidence-informed prevention, education and policy options in New Brunswick, as elsewhere. This investigation uses a new data source to measure the problem to help make a difference in protecting and promoting the health of the province’s children and youth.
Title of the research project - Titre du projet de recherche
Plasma volume changes in obese individuals and their effect on plasma solute measures. Les variations du volume plasmatique chez les individus obèses et leurs effets sur les mesures des métabolites plasmatiques.

Poster presenter - Nom de la personne qui présentera l'affiche
Georges Jabbour

Researchers involved in this project - Chercheurs participant au projet
Jabbour, Georges

Abstract-Résumé
Previous studies have demonstrated that considerable plasma volume changes (ΔPV) occur during and after exposure to different environmental and physiological conditions. Such changes have an important effect on plasma concentration of metabolite values. Currently, no study has examined ΔPV in individuals with different body weight status and used ΔPV to correct plasma solute values. The aims of this study were to assess 1) the effect of body weight status on ΔPV and 2) the impact of these variations on lactate [La] and glucose [Glu] measures in normal-weight, overweight and obese adolescent boys. Methods: Participants performed a Cycling Sprint Test at their maximal power output. ΔPV were calculated using two methods, and both [La] and [Glu] were compared using total circulating values and corrected values for ΔPV: [La]T vs. [La]cr and [Glu]T vs. [Glu]cr. Results: Following exercise, ΔPV values decreased significantly from rest value and were higher in OB compared to OW and NW (p<0.01). Moreover, ΔPV were correlated with body weight status (r=0.85; p<0.05). While [La]T and [Glu]T differed among the groups, no difference persisted when these values were corrected for ΔPV. The differences between total circulating and corrected values were significant.

Conclusion: The impact of body weight status on ΔPV and thus, on various plasma measures in response to exercise is important and should be considered in further studies.

Des travaux antérieurs ont rapporté des variations plasmatiques (ΔVP) significatives lors et après une exposition à des conditions environnementales et physiologiques variées. De telles variations ont un effet important sur les concentrations plasmatiques de plusieurs métabolites. Aujourd'hui, aucune donnée ne concerne la ΔVP chez des individus à différents statuts pondéraux d'autant plus qu'aucune étude n'a considéré ce facteur pour corriger les valeurs plasmatiques. Cette étude vise à évaluer l'effet du statut pondéral sur la ΔVP et l'impact de celle-ci sur les valeurs plasmatiques de lactate [La] et de glucose [Glu] chez des adolescents à poids normal (N), en surpoids (S) et obèses (O). Méthodes: Tous les participants ont performé un test de sprint sur ergocycle à puissance maximale. Les valeurs de ΔVP ont été calculées à l'aide de deux méthodes et les concentrations de [La] et de [Glu] ont été comparées en valeurs brutes et en valeurs corrigées en fonction de ΔVP: [La]b vs. [La]cr et [Glu]b vs. [Glu]cr. Résultats : À l'issu de l'exercice, les valeurs de ΔVP ont significativement diminué par rapport au repos et étaient plus élevées chez O comparé à S et N (p<0,01). Une corrélation significative a été obtenue entre ΔVP et le statut pondéral chez les trois groupes (r = 0,85; p<0,05). Bien que les valeurs de [La]b et [Glu]b diffèrent entre les trois groupes aucune différence n’a persisté quand ces valeurs ont été corrigées en fonction de ΔVP. Les différences entre les valeurs plasmatiques brutes et les valeurs corrigées étaient significatives. Conclusion : l’impact du statut pondéral sur ΔVP et ainsi, sur les mesures plasmatiques en réponse à l’exercice est important et devrait être considéré dans les études futures.
Antiproliferative, antiandrogenic and cytotoxic effects of novel caffeic acid derivatives in LNCaP human androgen-dependent prostate cancer cells

Mohamed Touaibia

Touaibia, Mohamed; Sanderson, J. Thomas; Clabault, Hélène ; Patton, Cody ; Grégoire Lassalle-Claux, Grégoire ; Jacques Jean-François, Jacques; Paré, Aurélie F. ; Hébert, Martin J.G. ; Surette, Marc E.

Abstract
Caffeic acid and its naturally occurring derivative caffeic acid phenethyl ester (CAPE) have antiproliferative and cytotoxic properties in a variety of cancer cell lines without displaying significant toxicity toward healthy cells, and are considered to be potential anticancer agents. However, little is known about their effects on prostate cancer cells. We synthesized and evaluated the effects of caffeic acid, CAPE (2) and 18 synthetic derivatives on cell viability and androgen-dependent cell proliferation, subcellular localisation and expression of androgen receptor (AR) and secretion of prostate-specific antigen (PSA) in LNCaP human hormone-dependent prostate cancer cells. Several synthetic derivatives of CAPE were strong, concentration-dependent cytotoxic agents in LNCaP cells with IC50 values in the 6.8-26.6 µM range, potencies that were up to 5-fold greater than that of CAPE (33.7 ± 4.0 µM). A number of caffeic acid derivatives were inhibitors of androgen-stimulated LNCaP cell proliferation, with concomitant inhibition of DHT-stimulated PSA secretion. Compound 24 was the most cytotoxic and antiproliferative caffeic acid derivative (IC50 values of 6.8 ± 0.3 and 2.4 ± 0.8 µM, respectively) inhibiting DHT-stimulated cell proliferation and PSA secretion statistically significantly at concentrations as low as 0.3 µM. Exposure to DHT increased cytoplasmic and nuclear AR levels and co-treatment with increasing concentrations of compound 24 or CAPE (2), notably, further increased these levels.
Title of the research project - Titre du projet de recherche
The Impact of Mindfulness on Leadership in a Health Care Setting: A Pilot Study

Poster presenter - Nom de la personne qui présentera l'affiche
Louise Wasylkiw & Judith Holton

Researchers involved in this project - Chercheurs participant au projet
Wasylkiw, Louise; Holton, Judith; Azar, Rima; Cook, Bill.

Abstract - Résumé
The present study was undertaken to examine the impact of a mindful based intervention (MBI) on leadership. Eleven mid-level health-care managers in Eastern Canada took part in an intensive weekend workshop (16 hours) to explore the nature of mindfulness and the intentional cultivation of attention, awareness and attitudes, with the goal of establishing a personal practice. In comparison to controls (n = 10), retreat participants showed significant increases in mindfulness and corresponding decreases in perceived stress that were sustained across 8 weeks post retreat. Additionally, retreat participants reported significant increases in leadership effectiveness and aspects of authentic leadership. Importantly, we also showed that changes in leadership were corroborated by others. Specifically, 360 reports by supervisors, peers, and subordinates (n = 28) showed that others perceived changes in the extent to which participants reinforced a level of openness with others (transparency) and the degree to which participants solicited opinions and viewpoints of others prior to decision making (balanced processing). Overall, our data provide preliminary support for a proposed model whereby mindfulness influences leadership by causing positive affective states (e.g., decreased stress), which then exert direct effects on behavioral patterns related to leadership. Given the current climate in health services organizations, our study offers a potential strategy for enhancing efficacy of leadership development efforts in the face of persistent and unpredictable organizational change. We conclude by outlining the limitations of the present study and provide avenues for future research.
Title of the research project - Titre du projet de recherche
Assessing men’s acceptability and feasibility of a community-based intervention for weight control and management: A qualitative case-study

Poster presenter - Nom de la personne qui présentera l'affiche
Sara Jane Vermette

Researchers involved in this project - Chercheurs participant au projet
Demers, Mireille; Bastarache, Bionca; Jbilou, Jaiila; Pakzad, Sarah.

Abstract - Résumé
Rationale: Men fare much worse than women in the health and well-being, notably suffering death rates from cancer, heart disease, unintentional and intentional injuries. Moreover, they are under-users of healthcare services, as well as hard-to-reach in terms of health interventions and preventive programs. Objectives: 1) to assess the acceptability and feasibility of a community-based intervention aiming to promote healthy practices among men; and 2) to improve healthcare services for men by developing recommendations based on their specific needs and the availability of community resources. Methods: Qualitative study using focus groups composed exclusively of men. Verbatim were analysed using a thematic content analysis. Results: Three focus groups were done. The analysis revealed five major themes: 1) health information must be easily retrievable, action-oriented and delivered in simple and concise terms; 2) peer and family support, especially from one’s partner, are crucial in fostering motivation; 3) shared decision making, comprehensiveness of care, informational continuity, support and humanity were considered most important within clinical practice; 4) perception of need among men in regards to healthcare is greatly conditioned by hegemonic masculinity; 5) interventions must be easily integrated into daily life, thus suggesting the inclusion of workplaces and flexible hours. Conclusion: Healthcare professionals must be sensitive to men’s particularities in regards to compliance and healthcare utilization in order to better adapt these. Further research should focus on factors influencing perception of need and men-sensitive health communication, as they are essential to address in order to improve motivation and compliance among men.

Problème : L’état de santé et de bien-être des hommes est plus précaire que celui des femmes. Notamment, ils sont plus susceptibles aux mortalités associées aux cancers, aux maladies cardiovasculaires, ainsi qu’aux blessures intentionnelles et accidentelles. De plus, ce sont des sous-utilisateurs des services de santé et sont difficiles à atteindre à l’égard des interventions en santé et de programmes préventifs. Objectifs : 1) évaluer l’acceptabilité et la faisabilité d’une intervention communautaire qui vise l’engagement des hommes dans des pratiques saines; et 2) améliorer les services de santé destinés à ces derniers en développant des recommandations basées sur la spécificité de leurs besoins et la disponibilité des ressources communautaires. Méthodes : Étude qualitative à l’aide de groupes témoins développés exclusivement pour hommes et analyse thématique des transcriptions. Résultats : Trois groupes témoins ont été réalisés. L’analyse a révélé cinq thèmes principaux: 1) l’information sur la santé doit être facilement récupérable, axée sur l’action et présentée sous forme simple et concise; 2) le support des pairs et de la famille, surtout de la conjointe, est crucial à la motivation; 3) la prise de décision partagée, la globalité des soins, la continuité informationnelle, le support et l’humanisme sont ressortis comme primordiaux à la pratique clinique; 4) la perception de besoin chez les hommes est grandement conditionné par la masculinité hégémonique; 5) les programmes d’intervention doivent être facilement intégrées à la vie quotidienne, ainsi suggérant l’inclusion des lieux de travail et l’offre d’heures flexibles. Conclusion : Les professionnels de la santé doivent être sensibilisés aux particularités des hommes en termes d’adhésion et d’utilisation des services de santé afin de mieux adapter ceux-ci. D’autres recherches devraient se concentrer sur les facteurs influençant la perception de besoin, et la communication en santé adaptée aux hommes afin d’améliorer la motivation et l’adhésion parmi les hommes.
Title of the research project - Titre du projet de recherche
M-Health for sexual and reproductive health promotion in youth: A systematic review.

Poster presenter - Nom de la personne qui présentera l'affiche
Lindor Clifford Paul

Researchers involved in this project - Chercheurs participant au projet
Lindor, Clifford Paul; Jbilou, Jalila; Sarah, Pakzad; Anik, Dubé; Éric, Hervet; Marie-Hélène, Chomienne.

Abstract - Résumé
Introduction: The expansion of new communication systems provides opportunities to promote sexual and reproductive health (SRH) in youth. Mobile devices have become part of the everyday routine of every youth. This paper summarizes the current research examining mobile-based interventions (m-Health) delivered through mobile electronic devices for promoting SRH. Method: A systematic review based on an electronic based research was conducted for studies published between January 2005 and July 2013. Studies were included in the review if they (1) assessed a preventive intervention on SRH delivered via mobile technologies, (2) through RCT design, and (3) published in English in a peer-reviewed journal. Results: We identified 22 relevant studies. Knowledge and beliefs outcomes and intention to get tested and to adopt safer sex behavior were observed in most studies. Youth centeredness, interactivity and positive messages were found to be important determinants of effective m-Health interventions. Conclusions: Nowadays, adopting m-Health is increasingly an inevitable solution for SRH promotion among youth. This review suggests that mobile-delivered health education and awareness interventions have a high potential for improving knowledge in SRH and safer sex behaviors. However, more research is needed to study determinants and impacts of m-Health utilization and compliance in youth and its cost-effectiveness. Moreover, specific ethical issues have to be considered in future studies.

Title of the research project - Titre du projet de recherche
Development and preliminary validation of an original physical education test battery for the evaluation of fundamental motor skills of 2nd, 5th and 8th grade students: Pilot study

Poster presenter - Nom de la personne qui présentera l'affiche
HORIA-DANIEL IANCU

Researchers involved in this project - Chercheurs participant au projet
IANCU, HORIA-DANIEL; PICARD, YVAN; BÉLANGER, MATHIEU; RICHARD, JAQUES.

Abstract - Résumé
A key role of quality school physical education is to enable children to learn and master motor skills, which are crucial for the adoption of an active lifestyle. The identification and assessment of fundamental motor skills therefore become essential. A review of the literature shows there is a lack of measurement tools in this area. Accordingly, we have developed an original battery of 24 tests for the evaluation of fundamental motor skills. We have identified the motor skills to be assessed, developed evaluation parameters for each skill by focusing on the performance process (quality) rather than the product, and determined the tests procedures. A pilot study of this battery began in September 2012 in six schools (N = 700 students) of New Brunswick, in order to verify the feasibility, validity and reliability of these tests. Following our first visits, we modified the instructions for some tests to improve clarity and we adjusted the estimated time of administration and procedures for some grade levels. At the same time, the physical education teachers used the assessment forms and gave us a first opinion on the test parameters (examples will be presented during the congress). Presently, we are assessing reliability (inter-judge, intra-judge and test-retest) and validity of five tests. The first steps of the process suggest that the development of this battery is promising. A process of establishing standardized norms will also be implemented. This battery of tests could become a standard measure for assessing the objectives of physical education within school curriculums.

Un rôle clé de l’éducation physique scolaire de qualité est de permettre aux jeunes d'apprendre et de maîtriser les habiletés motrices qui, en retour, sont cruciales pour l’adoption d’un mode de vie actif. L’identification et l’évaluation des habiletés motrices fondamentales deviennent donc indispensables. Une revue de la littérature démontre qu’il y a un manque d’outils de mesure dans ce domaine. En conséquence, nous avons conçu une batterie originale de 24 tests pour l’évaluation des habiletés motrices fondamentales. Nous avons identifié les habiletés motrices à évaluer, développé les paramètres d’évaluation pour chaque habileté en misant sur le processus (qualité) de l’exécution plutôt que sur le produit, et déterminé la procédure des tests. Une étude pilote de cette batterie a débuté en septembre 2012 dans six écoles (N=700 élèves) du Nouveau-Brunswick, dans le but de vérifier la faisabilité, la validité et la fidélité de ces tests. À la suite de nos premières visites, nous avons modifié les instructions pour certains tests afin de les rendre plus claires, et aussi ajusté le temps par élève, le temps total d’administration et certaines procédures pour chaque niveau scolaire ciblé. En même temps, les enseignants d’éducation physique des classes concernées ont travaillé avec les grilles d’évaluation et nous ont donné une première opinion quant aux paramètres de tests (des exemples seront présentés lors du congrès). Actuellement, nous évaluons la fidélité (inter-juge, intra-juge et test-retest) et la validité de cinq tests. Les premières étapes du processus suggèrent que le développement de cette batterie de tests est prometteur. Un processus d’établissement de normes sera également mis en place. Cette batterie de tests pourrait donc servir en tant qu’outil de mesure pour l’évaluation de l’atteinte des objectifs des programmes d’études en éducation physique.
Title of the research project - Titre du projet de recherche
Reasons why self-referred obese participants withdrew from a free lifestyle intervention program
delivered by highly skilled professionals

Poster presenter - Nom de la personne qui présentera l'affiche
Kate Morrison

Researchers involved in this project - Chercheurs participant au projet
Morrison (health professional), Kate; Miedema, Baukje (Bo); Reading, Stacey; Hamilton, Ryan;
Easley, Julie.

Abstract - Résumé
Objective: To examine the reasons why self-referred participants drop out of a multi-disciplinary
lifestyle intervention designed to assist class I and II obese adults in the management of their
condition. Intervention: The intervention consisted of 3x weekly physical activity sessions and
bi-weekly nutritional educational sessions. Two of the four groups, one urban and one rural,
received bi-weekly group mediated cognitive behavioural intervention sessions. The 6-month active
intervention was followed by a 6 month self-management period; 146 participants with a BMI
between 30 and 40 enrolled. Methods: This poster focuses on the qualitative telephone interviews
conducted with 36 participants who dropped out of the active intervention. In the telephone
interviews a number of open-ended questions were utilized. The recorded interviews were
transcribed verbatim and thematically analyzed. Results: Attrition from the active intervention was
39%. Several themes emerged from the analysis: 1) injury and/or family/work pressure; 2) staff
and/or program did not meet expectations; 3) lack readiness to make lifestyle changes. Discussion:
A free intervention program specifically designed to enhance the health of class I and II obese
self-referred participants experienced high drop-out. Self-referral does not equate to high
motivation. Cognitive dissonance theory may provide a useful theoretical framework to explain
drop-out. Likely, many participants need to join interventions or programs several times before they
are able to commit long enough to reap health benefits. Perhaps the same behaviour principles for
smoking cessation need to be drawn-up for this population before they are able to make lifestyle
changes to improve their health.
Title of the research project - Titre du projet de recherche
Does post warm-up heart rate level affect subsequent exercise performance in obese adolescents?
Est-ce-que la fréquence cardiaque en post-échauffement affecte la performance subséquente chez les adolescents obèses?

Poster presenter - Nom de la personne qui présentera l'affiche
Patrick Richard

Researchers involved in this project - Chercheurs participant au projet
Richard, Patrick; Iancu, Horia-Daniel; Jabbour, Georges.

The plasma volume, which largely affects heart rate level, decreases significantly in obese individuals when performing submaximal exercise. Consequently, the warm-up period consisting of several minutes of exercise at low intensities may affect the heart rate levels in obese individuals and potentially their performance in subsequent exercises. Objective: This work examines the relationship between the heart rate levels obtained after warm-up period and performance developed during supramaximal exercise test in obese (O), overweight (OW) and normal-weight (NW) adolescent boys. Methods: Adolescents performed, on an ergometer cycle, an exercise sprint test consisting of 6 repetitions of 6 seconds at their peak power (determined before during a charge velocity test). 10 minutes warm-up (intensity equal to 55% of VO2max) preceded the exercise sprint test. Results: The heart rate levels obtained after the warm-up period were significantly higher in obese (O) compared to overweight (OW) and normal weight (N) adolescent boys (p<0.01 respectively) and were negatively associated to performance reduction determined as the percentage of the power variation from the first to the sixth repetitions (ΔPm %) (r = -0.79, p <0.05). Moreover, after warm-up the heart rate values were associated with plasma volume changes (r = 0.89, p <0.05). Conclusion: Our results suggest that the increase in heart rate during the warm-up period, associated to decreased plasma volume, can limit the performance during repeated sprint exercise in obese and overweight adolescent boys. This an important performance limiting factor in this population.

Le volume plasmatique, qui conditionne largement la fréquence cardiaque, diminue chez les personnes obèses lors d’un exercice sous-maximal. Par conséquent, l’échauffement, composé de plusieurs minutes d’exercices à faible intensité, pourrait affecter la fréquence cardiaque des personnes obèse et probablement leurs performances subséquentes. Objectif : Ce travail examine la relation entre la fréquence cardiaque en post échauffement et la performance développée lors d’un test supramaximal chez des adolescents obèses (O), en surpoids (S) et de poids normal (N). Méthodes : Des adolescents ont exécuté un test de sprint répété sur un ergocycle composé de 6 répétitions de 6 secondes à leur puissance maximale. Une période d’échauffement de 10 minutes (intensité égale à 55% de VO2max) a précédé le test. Résultats : Après l’échauffement, la fréquence cardiaque augmentait significativement chez O comparativement aux S et N (p<0.01 respectivement). Toutefois, elle était négativement associée à la dégradation de performance, déterminée par le pourcentage de variation de puissance entre la première et la sixième répétition (ΔPm %) (r = -0.79, p <0.05). De plus, la fréquence cardiaque en post échauffement était associée à une diminution du volume plasmatique chez les trois groupes (r = 0.89, p <0.05). Conclusion : Nos résultats suggèrent que l’augmentation de la fréquence cardiaque durant l’échauffement, associé à une diminution du volume plasmatique, peut limiter la performance chez O et S lors d’un exercice de sprint répété. Par conséquence, il importe de considérer ce facteur lors de la prescription d’un exercice afin de limiter les diminutions de performance subséquentes.
Barriers to physical activity among children with type 1 diabetes.

Poster presenter - Laura Pelletier

Researchers involved in this project - Jabbour, Georges; Pelletier, Laura; Mathieu, Marie-Ève.

Abstract - Regular physical activity is associated with numerous benefits such as improved quality of life and decreased cardiovascular risk factors and mortality in type 1 diabetic patients (T1D). Despite this evidence, 60% of patients remain sedentary. Several barriers limit the physical activity practices among T1D. However, there is no data concern in children. The purpose of this study was to investigate the most relevant barriers in children. We were also interested in parents and doctors as potential contributors. A 12-item self-administered questionnaire was answered by 103 T1D children. They were divided into two subgroups: group 1 (G1) (n=32) for age inferior to 12 years old and group 2 (G2) (n=70) for age equal or superior to 12 years old. For the Barriers to Physical Activity in Diabetes (type1) (BAPAD1) scale, participants rated 12 barriers to physical activity on a scale from 1 to 7 (1, extremely unlikely, and 7, extremely likely). For G1 the highest barrier scores were fear of hypoglycemia (3.98± 1.9), loss of control over diabetes (2.71±1.63), and external temperature (2.71±1.09). For G2 the highest barrier scores were loss of control over diabetes (3.01±1.09), and fear of hypoglycemia (2.88± 1.81). Moreover, 88% of G1 participants and 91% of G2 participants reported that parents discouraged physical activity. Our results showed a different perception of barrier to regular physical activity between groups. Moreover, parents should be more involved to encourage their children to be more active.
Title of the research project - Titre du projet de recherche
Anti-mycobacterial triterpenes from Alnus incana and Empetrum nigrum

Poster presenter - Nom de la personne qui présentera l'affiche
Haoxin Li

Researchers involved in this project - Chercheurs participant au projet
Webster, Duncan; Johnson, John; Gray, Christopher.

Abstract - Résumé
The increasing emergence of drug resistance to current chemotherapies represents an immense challenge for the control of tuberculosis. As tuberculosis drug discovery has had historically a lower priority than other anti-infective drugs, the requirement for new anti-mycobacterial therapeutics has now become critical. Medicinal plants have proven to be a rich source of natural products that have great potential in drug discovery. Our search for bioactive natural products from First Nations' traditionally used medicinal plants has revealed their potential as sources of anti-mycobacterial compounds. Crude extracts of Alnus incana (gray alder) and Empetrum nigrum (black crow berry), both of which were used to treat tuberculosis and its associated symptoms, showed high anti-mycobacterial activity in our preliminary screening. Bioassay guided fractionation of the two plants yielded seven anti-mycobacterial triterpenes that were identified using standard spectroscopic techniques and validates the traditional use of these plants by Canadian First Nations.
Natural products continue to play an unparalleled role in drug discovery and development in a world where drug resistance is becoming a major issue. Fungal endophytes are a relatively unstudied source of new bioactive natural products, primarily due to the difficulties associated with their isolation, and are a potential solution to this problem. We have compiled a library of 209 fungal endophytes from traditionally used medicinal plants and marine macroalgae that exhibits high fungal diversity and contains many new or unknown species. Extracts of the fungi were tested against four pathogenic microorganisms: a Gram positive bacterium (Staphylococcus aureus), a Gram negative bacterium (Pseudomonas aeruginosa), a fungus (Candida albicans), and a mycobacterium (Mycobacterium tuberculosis). Many of the crude extracts showed promising bioactivity in the screening assays, leading to further investigation to determine the identity of the biologically active constituents. To date, we have isolated seven bioactive natural products from endophytes in our library that have shown a range of biological activity. We have therefore demonstrated that endophytic fungi are a promising source of bioactive natural products and we will continue to investigate them for their natural products.
Title of the research project - Titre du projet de recherche
Seasonal and tissue variation of falcarindiol, the primary antimycobacterial constituent of the Canadian medicinal plant Heracleum maximum

Poster presenter - Nom de la personne qui présentera l'affiche
Kathryn Melvin

Researchers involved in this project - Chercheurs participant au projet
Melvin, Kathryn ; O'Neill, Taryn E. ; Webster, Duncan; Johnson, John A. ; Gray, Christopher A..

Abstract - Résumé
The plant Heracleum maximum is used by the First Nations of Canadian Maritime provinces for various medicinal applications, including treatment of tuberculosis and its associated symptoms. We recently showed that an extract from H. maximum roots collected in the fall of 2011 contained significant amounts of the antimycobacterial natural product falcarindiol. The observed bioactivity, low toxicity and reported health benefits of falcarindiol and related molecules have recently stimulated interest in this class of natural products. The identification of a readily available source of falcarindiol would facilitate further research and development of this natural product. Individual H. maximum plants were collected in spring, summer and fall seasons of 2010, 2011 and 2012. The antimycobacterial activity of the resulting extracts was evaluated against Mycobacterium tuberculosis (H37Ra) using the microplate resazurin assay (MRA). The results from the MRA indicate the antimycobacterial activity of H. maximum is variable between years, seasons and plant organs. Antimycobacterial activity tended to be highest in the summer and extracts from flowers generally produced the most bioactivity. Based on these results we are investigating whether the antimycobacterial activity of H. maximum varies seasonally or between organs (stem, leaf, root, and flower) of the plant and whether any variation in antimycobacterial activity can be correlated to the levels of falcarindiol in the plant tissue. The levels of falcarindiol in the extracts are currently being quantified by liquid chromatography – mass spectrometry for comparison with observed bioactivity through the MRA.
Title of the research project - Titre du projet de recherche
An association between obesity and self-reported falls in older Canadians

Poster presenter - Nom de la personne qui présentera l'affiche
Grant Handrigan

Researchers involved in this project - Chercheurs participant au projet
Handrigan, Grant; Maltais, Naomie; Teasdale, Normand; Hue, Olivier; Corbeil, Philippe; Hamel, Denis; Lamontagne, Patricia; Gagné, Mathieu; Jean, Sonia.

Abstract - Résumé
Introduction: Falls related injuries are cause for both reduced mobility and increased mortality in elderly Canadians. Postural instability and balance disorders have been identified as risk factors of falling. Recent laboratory studies report associations between reduced balance control and increased body mass. These observations have led to questioning a possible association between obesity and falls. This project evaluated the relationship between obesity and self-reported falls in the Canadian population aged 65 and older. Methods: Data from the Community Health Survey for Healthy Aging (CCHS-HA), a sample survey with a cross-sectional retrospective design, were used for analysis. After exclusion criteria were applied, 15,354 (6,314 men) respondents remained eligible. Logistic regression models were used to determine the relationship between obesity and falls, and are adjusted for confounding variables. Results: Respectively, 21.6% and 16.8% of women and men respondents reported a fall in the previous 12 months. For both sexes, participants reporting a fall were more likely to be older, underweight or obese, inactive and low perceived health. For men, only obese individuals (OR:1.48 C.I. (1.24-1.78)) fell significantly more than normal weight (OR:1-reference group) , the other BMI groups presented no significant differences: overweight (OR:0.96 C.I. (0.82–1.12)), and underweight (OR:2.35 C.I. (1.06–5.21)) individuals. For women, obese individuals (OR:1.24 C.I. (1.08–1.42)) fell more than overweight (OR:0.95 C.I. (0.85–1.07)), underweight individuals (OR:0.98 C.I. (0.74–1.31)) and normal weight individuals (OR:1-reference group). Conclusion: In this study, obesity is associated with increased falls in men and women aged 65 and older.
Title of the research project - Titre du projet de recherche
Soutien à l’autonomisation des adolescents et des jeunes adultes francophones évoluant avec un trouble du spectre de l’autisme à travers des activités de loisirs

Poster presenter - Nom de la personne qui présentera l'affiche
Natalie Léger

Researchers involved in this project - Chercheurs participant au projet
Léger, Natalie ; Zaiane-Ghalia, Selma; Pakzad, Sarah; Richard, Jacques F.; Hervet, Éric; Villalon, Lita; Bourque, Jimmy; Pellan, Marie-Andrée; Turbide, Christian; Ford, Peter.

Abstract – Résumé
Le trouble du spectre de l’autisme (TSA) connaît une prévalence croissante (Charman, 2002; Rutter, 2005; Fombonne, 2012) affectant une personne sur cinquante (Blumberg, S. J., 2013) et ayant des défis qui persistent dans le temps. Compte tenu de l’augmentation de l’espérance de vie en Amérique du Nord, ainsi que du nombre croissant de diagnostics posés en bas âge, la population d’adultes vivants avec un TSA ne fera que croître, et pourtant, les impacts d’un TSA à l’âge adulte sont peu étudiés (Barnard et al., 2001; NAS, 2008) ce qui rend cette recherche à la fois importante et pertinente. L’objectif de la présente étude est de faire connaître les besoins et les services disponibles à notre population cible, soit les adolescents et jeunes adultes francophones ayant un TSA et vivant au sud-est du Nouveau-Brunswick. Pour se faire, nous mènerons des entretiens auprès d’organismes provinciaux et communautaires ainsi que des entrevues auprès d’individus ayant un TSA, des membres de leur famille et des intervenants en autisme. Ces données nous aiderons à mieux comprendre les besoins de cette population et à anticiper la mise sur pied de nouveaux services pouvant appuyer leur autonomisation. Les informations recueillies serviront à construire un inventaire informatisé faisant état des activités de loisirs, des personnes ressources et des services privés ou publics accessibles à la population cible. Cette étude est en cours, toutefois, plusieurs entretiens auprès d’organismes gouvernementaux et communautaires nous ont permis d’entamer notre base de données informatisée rassemblant à la fois recherches, services et personnes ressources.
Title of the research project - Titre du projet de recherche
PATIENT VOICE: APPRECIATIVE INQUIRY INTO LIVING WELL WITH DIABETES

Poster presenter - Nom de la personne qui présentera l'affiche
Jean Burgess

Researchers involved in this project - Chercheurs participant au projet
Burgess, Jean.

Abstract - Résumé
This study explores the question “What factors contribute to successful self-management of chronic disease/diabetes from the patients’ perspective?” It analyses individual interviews with 13 adults with diabetes about living well with diabetes, and their dreams of enhanced conditions for successful self-management of diabetes. The study has two assumptions: 1) patients have unique, particular, and holistic knowledge of their health and self-management practices, 2) Appreciative Inquiry locates and enhances the positive and life-giving forces in individuals and systems. Appreciative Inquiry is thus seen as an appropriate methodology to use in the discovery of the positive, life-giving attitudes, actions, and dreams of the participants. Thematic Analysis of the interview data identifies that positive personal qualities, reciprocal interpersonal support, and experiential expertise are three themes which interact and enable participants to live well with diabetes. Frank’s illness narrative theory is used to frame the quest narrative manifest in the overarching theme, simultaneously embracing diabetes management and life.
Title of the research project - Titre du projet de recherche
Discovery of natural product based efflux inhibitors

Poster presenter - Nom de la personne qui présentera l'affiche
Andrew J Flewelling

Researchers involved in this project - Chercheurs participant au projet
Flewelling, Andrew; Johnson, John; Gray, Christopher.

Abstract - Résumé
With the consistent rise in reports of multidrug-resistant bacterial infections, the availability of effective anti-infective agents is a growing issue. The discovery of new antibiotics has decreased with only four new classes of antibiotics having been introduced since the 1960s. One mechanism associated with reduced drug efficacy in multi-drug resistant bacteria is the ability of pathogenic organisms to excrete, or efflux, antibiotics. Identifying efflux pump inhibitors that can be used in conjunction with existing antibiotics against multi-drug resistant strains of bacteria may offer new therapeutic options by enabling the extended use of current pharmaceuticals. We have therefore developed a bioassay that will facilitate the discovery of natural products efflux pump inhibitors. These inhibitors may provide benefits in the treatment of diseases caused by multi-drug resistant strains of Staphylococcus aureus, Pseudomonas aeruginosa, and Mycobacterium tuberculosis. Efflux inhibition is assessed by exposing the pathogens to a sublethal dose of an antibiotic, and a test extract. Increased activity of the antibiotic indicates a potentiation effect caused by the crude extract. This assay has been validated through the screening of crude extracts obtained from endophytic fungi isolated from macroalgae of the Shetland Islands with a significant proportion (>15%) showing efflux pump activity. Fractionations of promising crude extracts are ongoing to identify the biologically active constituents.
Title of the research project - Titre du projet de recherche
Subjective Patient Outcomes and Surgical Morbidity in Decompression with an Interspinous Process Device vs. Decompression and Fusion for Treatment of Stable Degenerative Spondylolisthesis

Poster presenter - Nom de la personne qui présentera l'affiche
Alana Green

Researchers involved in this project - Chercheurs participant au projet
Abraham, Edward P.; Green, Alana J.; Murray, Joshua; McKeon, Melissa; Manson, Neil.

Abstract - Résumé
Background: Decompression with an Interspinous Process Device (IPD) is an emerging treatment for stable degenerative spondylolisthesis. However, little research compares the outcomes of this new method to traditional treatments. This study assessed surgical morbidity and subjective patient outcomes between decompression with an IPD (DIPD) and decompression and fusion (DF).

Methods: Patients (n=57) were recruited from the Canada East Spine Centre’s prospective surgical outcomes database. Baseline variables were examined using independent samples t-tests and chi-squared tests. OR time and blood loss were log-transformed. Time-varying outcomes (i.e. changes in pain, physical and mental functioning) were examined with a multilevel model of change.

Results: No differences in baseline characteristics were found between the two surgical groups. Average age was 65yrs, and average BMI was 30. Compared to DF patients, DIPD patients had shorter OR times (DIPD: 79.48min; DF: 153.50min), lost less blood (DIPD: 49.66mL; DF: 382.14mL) and had shorter hospitalization (DIPD: 0.45days; DF: 5.57days). There was no statistical difference in treatment satisfaction, with more than 90% of patients reporting high satisfaction in both groups. Overall, patients reported significantly decreased ODI scores, and increased physical and mental functioning. Although there was marked variation in the rate of improvement, there were no significant differences between groups.

Discussion: Lower surgical morbidity, equivalent reoperation rate, and similar patient outcomes indicate that DIPD may be a valuable alternative to DF for the treatment of stable degenerative spondylolisthesis. Further studies should aim to quantify the cost benefits and evaluate long-term patient outcomes of DIPD vs. DF.
Body image and disordered eating researchers has focused almost exclusively on the female experience. The current study examined the relationship between the Big Five personality traits, body dissatisfaction, and eating attitudes in both genders. The current sample included 203 university students from the University of New Brunswick, Saint John. Participants completed a battery of self-report questionnaires pertaining to personality, disordered eating, and body image satisfaction. Significant gender differences were found in both body dissatisfaction and disordered eating; with females reporting higher levels on all measures. In the current study, however, men accounted for over 18% of participants reporting symptoms of disordered eating, which is larger than previous reports. Patterns of disordered eating were highly related to personality factors among female participants only, particularly high Neuroticism and low Conscientiousness, which replicates previous findings. In both males and females Neuroticism was positively correlated with body dissatisfaction, which supports research on females and suggests that males who are neurotic also experience higher levels of body dissatisfaction. Body dissatisfaction was consistently related to disordered eating attitudes and behaviours in females but this relationship was variable in males. Females with body dissatisfaction and disordered eating may be more prototypical than males with the same symptomology. Males may be experiencing body dissatisfaction and/or disordered eating for different, or more variable, reasons than females. This research has significant clinical applications, as it would be beneficial to develop well validated assessment tools for both genders in order to successfully address these growing issues in both genders.
Anticancer natural products from the Canadian medicinal plant, Populus tremuloides

Poster presenter - Nom de la personne qui présentera l'affiche
Allyson Bos

Researchers involved in this project - Chercheurs participant au projet
Bos, Allyson; Johnson, John; Gray, Chris; Jean, Stephanie; Robichaud, Gilles.

Abstract - Résumé
Cancer is currently a leading cause of death and due to the limited knowledge about this disease, drug-drug interactions and the increasing emergence of drug resistance, new anticancer therapeutics are needed. Populus tremuloides (trembling aspen) bark has been extensively used by First Nations peoples for a variety of illnesses. Our initial screening found the crude methanolic extract to exhibit strong anti-proliferative and apoptotic inducing activities against an aggressive human breast carcinoma cell line (MDA-MB-231). Bioassay guided fractionation of the bark extract has revealed fractions that exhibit both induction and inhibition of apoptosis in human breast cancer cells prompting further phytochemical investigation. Preliminary results have identified salicin as one of the bioactive constituents and found it to have moderate apoptosis inducing activity. We are currently isolating natural products from 12 bioactive fractions, all of which exhibit stronger activity than that exhibited by salicin, with the objective of finding novel chemical scaffolding to serve as potential anticancer drug leads.
Abstract - Résumé

Leukotrienes (LTs) are lipid mediators implicated in a large number of inflammatory disorders. Consequently, the development of therapies modulating the LTs biosynthesis pathway through the inhibition of 5-lipoxygenase (5-LO) is a promising strategy for the treatment of these disorders. Omnipresent in the plant world, caffeic acid and its derivatives have shown good anti-LTs activity in past studies, linked to their antioxidant properties. This project aimed to investigate the structure-activity relationship of caffeic esters bearing 1,4-disubstituted-triazoles in order to better comprehend the structural features that modulate anti-LTs activity with this class of compounds. Four distinct series of caffeic acid analogs, encompassing 32 caffeic and cinnamic esters and amides, have been synthesized by 1,3-dipolar cycloaddition and tested for their anti-radical and anti-LTs activities. These compounds vary from each other by the presence or absence of phenolic hydroxyl groups, the presence of an ester or amide bond between the phenylpropanoid and clicked terminal group, and the variably substituted terminal aryl groups. All caffeic compounds have excellent radical scavenging activity when compared to their cinnamic analogs, which possess both no anti-radical or anti-LTs activity. Interestingly, most caffeic esters outperformed amides and showed good 5-LO IC50 in HEK293 cells. Many esters also showed anti-LTs activity similar to clinical 5-LO inhibitor Zileuton in stimulated PMNL. However, anti-LTs activity does not seem to be directly correlated to anti-radical activity and no obvious trend was found with respect to triazole substituent modification.
Title of the research project - Titre du projet de recherche
High Density Electromyography and Multifunction Myoelectric Prosthesis Control: A Clinical Outlook

Poster presenter - Nom de la personne qui présentera l'affiche
Dr. Usha Kuruganti

Researchers involved in this project - Chercheurs participant au projet
Prime, Craig; Kuruganti, Usha; Losier, Yves.

Abstract - Résumé
Myoelectric prostheses have been accepted as a standard prosthetic option by upper limb amputees for several decades. Surface electromyography (EMG) has been used to obtain muscle activation information to train these systems for desired movements. Recently, advanced high density EMG (HDEMG) systems have allowed for more information to be obtained than conventional EMG systems. HDEMG systems provide a temporal spatial map of activity or ‘energy map’ that provides a visual indication of where activity is occurring. Surprisingly, the use of high density EMG with clinical groups has been limited. The purpose of this study was to use HDEMG to examine muscle activation patterns of transradial amputee participants. The data collected examined possible relationships between energy maps and pattern recognition classification accuracies (used for prosthesis control). In addition, muscle activation pattern differences between the clinical participants (congenital vs. traumatic) were investigated. Five wrist and hand isometric contractions at various intensity levels were examined from four transradial amputees (2 traumatic and 2 congenital). Each participant was examined as a separate case study with respect to energy maps and classification accuracies. No significant relationships were found between HDEMG data and classification accuracies. The limited results did, however, suggest traumatic amputees were more capable of reproducing their muscle activation patterns when compared to congenital amputees. The preliminary results suggest that while HDEMG may not be efficient or necessary when evaluating an amputee’s capacity to perform pattern recognition, the system may be helpful in better understanding the neuromuscular function of the residual limb.
Self-reported Satisfaction from Neuropsychological Assessment Feedback: Preliminary Findings from a Pilot Study

Poster presenter - Nom de la personne qui présentera l'affiche
JoAnne Savoie, Ph.D., L.Psych.

Researchers involved in this project - Chercheurs participant au projet
Savoie, JoAnne; Coupland, Richard.

Abstract – Résumé

Self-reported Satisfaction from Neuropsychological Assessment Feedback: Preliminary Findings from a Pilot Study In the context of rehabilitation, neuropsychological assessment delineates patients’ cognitive strengths and weaknesses to educate patients and families about their cognitive vulnerabilities, to help therapists work effectively within these limitations, and to guide treatment and discharge planning. Clear communication of assessment findings to patients and loved ones is therefore critical, yet it has received little empirical study as part of the neuropsychological assessment process (Pope, 1992; Smith, Wiggins, Gorske, 2007). The current study examines levels of satisfaction and understanding of test results for adult outpatients and their loved ones following receipt of neuropsychological assessment findings in a neurorehabilitation setting. Questionnaires were completed by 47 patients and 35 loved ones at the end of the feedback session. Most agreed or strongly agreed that the information received was well understood (98% of patients, 100% of loved ones) and useful for understanding their limitations (91% of patients, 97% of loved ones). They also agreed that it motivated them to follow treatment recommendations (89% of patients, 97% of loved ones). Correlations between patients and loves ones' general satisfaction overall was high (r=0.63, p<.001). Severity of depressive and anxiety symptoms, verbal reasoning and general intellectual functioning were not significantly correlated with patient satisfaction. Future directions for empirical study include the impact of the modality of feedback on satisfaction and other cognitive factors on understanding of neuropsychological assessment results. Implications for service delivery and recommendations on how to improve communication of assessment findings are discussed.

Dans le cadre de la réadaptation, l'évaluation neuropsychologique délimite les forces et les faiblesses cognitives afin d'éduquer le patient et sa famille et de guider les interventions thérapeutiques et la planification du congé. La communication des résultats doit donc être compréhensible afin d’être utile. Il reste que l'étude de la rétroaction des résultats suite à l'évaluation neuropsychologique est un domaine négligé dans la recherche empirique (Pope, 1992; Smith, Wiggins, Gorske, 2007). Le but de cette étude est d'examiner les taux de satisfaction et de compréhension des résultats de l’évaluation suite à la rétroaction des
résultats de l’évaluation neuropsychologique dans un cadre de réadaptation neurologique. Le questionnaire a été complété par 47 patients et 35 proches à la fin de la séance de rétroaction. La plupart étaient d'accord ou fortement d'accord que l'information reçue était bien comprise (98% des patients, 100% des proches) et utile pour comprendre leurs limites cognitives (91% des patients, 97% des proches). Ils ont également convenu qu'ils étaient plus motivés à suivre les recommandations de traitement suite à la rétroaction (89% des patients, 97% des proches). De plus, le taux de satisfaction corrélait fortement entre les patients et leurs proches (r = 0,63, p <.001). La sévérité des symptômes dépressifs et anxieux, le raisonnement verbal et le fonctionnement intellectuel général n'ont pas corrélé de façon significative avec la satisfaction du patient. Quelques orientations futures pour l'étude empirique de la rétroaction pourraient inclure l'impact de la modalité de la rétroaction sur la satisfaction et d'autres facteurs cognitifs sur la compréhension des résultats des évaluations neuropsychologiques. Des recommandations éculant de ses données empiriques sont présentées afin d'améliorer la prestation des services et la communication des résultats de l'évaluation neuropsychologique.
Title of the research project - Titre du projet de recherche

Poster presenter - Nom de la personne qui présentera l'affiche
Bin Zhang

Researchers involved in this project - Chercheurs participant au projet
Zhang, Bin; Coulombe, Dan; Savoie, Réjean; Kumar, S. Eshwar.

Abstract - Résumé
Background Early detection through participation in organized breast cancer screening, along with effective treatment, can significantly reduce mortality from breast cancer. Established in 1995, the New Brunswick Breast Cancer Screening Services (NBBCSS) has been providing bilateral, two-view screening mammograms biennially at 16 fixed sites in the province’s seven health regions.

Objective To examine the biennial participation rates of women aged 50-69 over the period 1996 to 2009.

Methods The screening and demographic data were obtained from the NBBCSS database, NB Medicare Registry and Statistics Canada. The participation rate is defined as the percentage of women who have a screening mammogram within 24 months as a proportion of the eligible population.

Results During the period 1996 to 2009, the biennial participation rate in NB ranged from a low of 32.6% to a high of 55.5% and all health regions showed an increasing participation rate over this period. Since 2001, NB has had the highest or the second highest biennial participation rate in Canada over multiple years, well above the corresponding national average (40.0% in 2005-2006).

Conclusion The Department of Health is particularly pleased with the high participation rate which reflects the fact that many women in NB have been actively participating in the organized breast screening program. With its announcement of expanding the target age group from 69 to 74 this June, biennial participation in NBBCSS for women aged 50-74 should be encouraged and promoted.
Interference of Gadolinium-Based Contrast Agents on Colorimetric Calcium Assays

Poster presenter - Nom de la personne qui présentera l'affiche
Ronald Yan

Researchers involved in this project - Chercheurs participant au projet
Yan, Ronald; Tarr, Heather; McNally, Martin; Cartier, Louis-Jacques; Chen, Yu.

Abstract - Résumé

Accurate calcium assay results are important for clinical practice. Current assay techniques have achieved clinically acceptable accuracy, however, cases of spurious hypocalcemia have been reported in literature after patients were administered gadolinium containing MRI contrast agents. Our study evaluated the potential interference effects of five gadolinium-based contrast agents, gadodiamide (Omniscan®), gadobenate (Multihance®), gadoxetate disodium (Primovist®), gadobutrol (Gadovist®), and gadoteridol (Prohance®) on all three widely used clinical laboratory colorimetric calcium assays. Plasma was collected from five healthy volunteers and then spiked with varying concentrations of the five contrast agents. Samples were then assayed on Roche Modular P platform using the newly developed 5-nitro-5’-methyl-1,2-bis(2-aminophenoxy)ethane-N,N,N’,N’-tetraacetic acid (NM-BAPTA) method, on Cobas Integra 400 o-cresolphthalein complexone method, and on Abbott Architect 16000 with an arsenazo-III dye. Gadobenate, gadobutrol, and gadoteridol did not interfere with any of the assays. There was a small positive bias (8%, p<0.01) at very high concentration (25 mmol/L) of gadoxetate disodium when calcium was assayed using the arsenazo-III method. Gadodiamide at very high gadodiamide concentration (50 mmol/L) induced a significant bias (16%, p<0.01) on calcium when measured using NM-BAPTA method; however a much bigger bias (90%, p<<0.01) when measured using arsenazo-III method. Significant interferences in calcium measurements using the OCP method began at gadodiamide concentrations as low as 0.5mmol/L (-9%, p<0.01), and the higher concentration of gadodiamide, the more negative bias. At clinically relevant concentrations, of all 5 contrast agents tested, only gadodiamide showed significant interference on the OCP calcium assay. The NM-BAPTA assay is essentially free of GBCAs interference and showed equal or better performance than the OCP and the arsenazo-III methods in terms of potential interference with gadolinium-based contrast agents.
AN IN-SITU COMPARISON OF SYSTEMIC TO LOCALLY PRODUCED HYPEROXIA ON CUTANEOUS BLOOD PERFUSION

Poster presenter - Nom de la personne qui présentera l'affiche
Maggie Yeomans

Researchers involved in this project - Chercheurs participant au projet

Abstract - Résumé
Background: Skin on the foot can be made hyperoxic by inhaling oxygen (O2)-enriched air or by soaking the foot in O2-enriched water. A consequence of systemically-induced hyperoxia is vasoconstriction of skin blood vessels. It is not known if locally-induced hyperoxia produces the same effect. This study will compare the effect of systemic and locally produced hyperoxia on cutaneous perfusion. Methods: Subjects inhaled O2-enriched air or soaked their feet in O2-enriched water for 30 minutes. Laser Doppler Perfusion Monitoring was used to assess perfusion in the microvasculature of the skin of the foot. Results: When the O2 partial pressure of the skin (PskO2) was increased by immersion in O2-enriched water, there was no observed reduction in skin perfusion. Subjects inhaling O2-enriched air while their feet were immersed in tap water had a 50% reduction in skin perfusion. Conclusion: Topically-induced hyperoxia from O2-enriched water does not cause vasoconstriction of the microvasculature in skin of the big toe. This is of special interest given the multifaceted purpose of blood flow. Not only does it transport O2 to tissues, but it also delivers other necessary nutrients, such as glucose, and removes metabolic waste products, such as carbon dioxide. Furthermore, blood plays a crucial role in the immune response to foreign objects and pathogens, as well as in blood coagulation. These findings suggest promise for the therapeutic use of O2-enriched water in the treatment of skin and wounds compromised by hypoxic ischemia.
Title of the research project - Titre du projet de recherche
Glioblastoma multiforme and metabolomics: towards a new diagnostic tool of temozolomide resistance

Poster presenter - Nom de la personne qui présentera l'affiche
Patrick-Denis St-Coeur (étudiant de maîtrise)

Researchers involved in this project - Chercheurs participant au projet
St-Coeur, Patrick-Denis; Poitras, Julie; Cuperlovic-Culf, Miroslava; Touaibia, Mohamed; Morin, Pier Jr.

Abstract - Résumé
The average lifetime for a patient diagnosed with a glioblastoma multiforme (GBM), the most aggressive glioma, is a little more than a year. The only available treatment for this cancer is the alkylating agent temozolomide (TMZ) in combination with radiotherapy. This molecule adds methyl groups to purine bases of DNA creating cytotoxic lesions therefore causing cell death. The mechanisms that remove those methyl groups and contribute to treatment resistance in GBMs are starting to emerge. Improving our knowledge of the molecular mechanisms and metabolic pathways associated with that resistance is important. The current project has focused so far on the following objectives: 1) identification of TMZ-resistant and sensitive cells in a panel of GBM cell lines and 2) identification and quantification of metabolites in resistant and sensitive GBM cells following TMZ treatment. To assess TMZ resistance, GBM cells were treated with up to 250 µM of the agent and cytotoxic effects were assessed using a crystal violet assay. U373 (41.6% viability) and LN229 (67.3% viability) were shown to be TMZ-sensitive and TMZ-resistant, respectively. Metabolic profiling of these same cell lines were performed and notably identified glycerol-3-phosphate and glucose as potential markers of resistance in these models. A specific metabolic signature that would discriminate between TMZ resistance and sensitivity seems to exist and is currently under study in primary GBM tumors.

L'espérance de vie moyenne d’un patient diagnostiqué avec le glioblastome multiforme (GBM), le gliome le plus agressif, est d’un peu plus d’un an. Présentement, le seul traitement disponible est un agent alkylant nommé Témozolomide (TMZ) en combinaison avec la radiothérapie. Cette molécule ajoute des groupements méthyles aux bases puriques de l’ADN créant des lésions mutagènes et cytotoxiques. Les mécanismes pouvant renverser cette méthylation et contribuer à la résistance chez les GBMs commencent à émerger. L’amélioration de nos connaissances des mécanismes moléculaires et métaboliques associés à ces derniers est donc primordiale. Ce projet s’aligne avec les buts de recherche suivant: 1) l'identification de lignées résistantes et sensibles au TMZ dans un panel de lignées cellulaires de GBM, 2) l’identification et la quantification des métabolites dans les lignées sensibles et résistantes après un traitement au TMZ. Pour évaluer la résistance au TMZ, les cellules GBMs furent traitées jusqu’à une concentration de 250µM de cet agent et les effets cytotoxiques ont été évalués avec la méthode du crystal violet. U373 (41.6% de viabilité) et LN229 (67.3% de viabilité) ont démontré une sensitivité et une résistance au TMZ, respectivement. Les profils métaboliques de ces lignées ont identifié le glycérol-3-phosphate et le glucose comme marqueurs potentiels de résistance. Une signature spécifique qui ferait une discrimination de la résistance et la sensibilité au TMZ est envisagée dans des échantillons de tumeurs primaires de GBMs.
Introduction. Kidney cancer accounts for 3% of new cancers diagnosed worldwide and its incidence has increased over the last 20 years. At metastatic stages, there is no effective treatment for Renal Cell Carcinoma (RCC) since these tumors are refractory to standard therapies. Inactivation of the tumor suppressor gene von Hippel-Lindau (VHL) is an early event in the development of RCC that occurs in up 85% of the cases. A small molecule, STF-62247, has been identified to specifically kill VHL-deficient renal cancer cells without affecting the viability of the cells with the functional gene. Objective. We used a quantitative proteomic strategy to understand the mechanism of action of the STF-62247 and identify potential targets. Methods. We described the use of SILAC (Stable Isotope Labeling by Amino acids in Cell culture) combined to mass spectrometry to study how the STF-62247 can affect the proteome of the VHL-deficient RCC cells treated to STF-62247. Results. By comparative analysis, we found 200 proteins that are more than 2-fold differently expressed in response to STF-62247. Several of these proteins are involved in endocytosis/lysosome pathways, metabolism, actin cytoskeleton, stress response chaperones and transcriptional regulation. Expressions of few proteins have been validated by western blot analysis. Conclusion. Our study demonstrated the potential of a quantitative proteomic strategy to identify proteins and signaling pathways involved in response to STF-62247, which could facilitate the development of new effective targeted therapies for renal cell carcinoma.
Title of the research project - Titre du projet de recherche
Sudden Cardiac Death Survivors due to Non Reversible Arrhythmic Causes: New Brunswick Experience.

Poster presenter - Nom de la personne qui présentera l'affiche
Satish Toal

Researchers involved in this project - Chercheurs participant au projet
Toal, Satish.

Abstract - Résumé
Introduction: Sudden Cardiac Death (SCD) is responsible for 300000 to 400000 deaths in the US annually. Patients with poor left ventricular function are most at risk. 5 to 10% of SCD are unexplained. Survival rates are low. Establishing a diagnosis can allow family screening for members at risk. We reviewed our data in New Brunswick. Methods: From July 2007 to September 2013, SCD survivors due to cardiac causes between the ages of 18 and 60 years were included. Those due to reversible causes like ischemia, drugs and electrolyte imbalances were excluded. Echocardiogram and catheterization was done in all and electrophysiology study as indicated.
Results: 26 survivors were identified. Mean age was 46.4 ± 13 years. There were 8 (31%) females. 14 (54%) had no structural heart disease. Mean age was 39.5 ± 14 (18 to 59) years. In 6 patients (5 males) SCD was idiopathic, 5 (2 males) had long QT, 1 (female) had probable catecholaminergic polymorphic ventricular tachycardia and 1 (male) had short coupled torsade and Wolff Parkinson White syndrome. Structural heart disease was identified in 12 (46%) patients. Mean age was 54.5 ± 3 (49 to 60) years. Ischemic heart disease was seen in 5 (4 males), dilated cardiomyopathy in 5 (4 males) and mechanical valve in 2 (1 male) patients. Discussion: Younger patients with SCD had normal hearts. There was male preponderance, except in long QT. Interestingly hypertrophic cardiomyopathy, right ventricular dysplasia and Brugada syndrome were not identified, perhaps representing the unique challenges of resuscitation in them.
Update of Humidex for climate-mortality risk assessment

Abstract - Résumé
Background: The continuing increase in morbidity and mortality risk during extreme heat events is becoming more and more significant with the global warming of the Earth climatic system. In Canada, Humidex, developed in late 70’s, is the common index used to quantify human discomfort to heat stress. Therefore, the purpose of this study is (1) to develop an updated version of Humidex that takes into consideration the effect of Global Solar Radiation (GSR), Total Cloud Amount (TCA) and Wind Speed, and (2) to analyze the relationships between mortality risk and Humidex and its updated version. Method: Daily records of hourly climate data are extracted from Environment Canada’s National Climate Archive for Winnipeg, Montreal, Fredericton, Toronto and Windsor weather stations. Principal Component Analysis (PCA) and the Generalized Extreme Value (GEV)-spline model have been used to select the covariates, to assess Humidex updating and to analyze the relationship between mortality and climate. Conclusion: The updated expression of Humidex, proposed in this study, is obtained from the climate-mortality model that integrates TCA as a covariate. This index measures the discomfort based on mortality risk and doesn’t represent the physiological impact of heat. Thus, further analyses are needed to better understand the relationship between the updated values of Humidex and the physiological reaction of human bodies.
Title of the research project - Titre du projet de recherche
Pilot Testing of Functional Electrical Stimulation (FES) Cycling on Spasticity in Persons with Spinal Cord Injury - FES Bike Study

Poster presenter - Nom de la personne qui présentera l'affiche
Melony Jones (Health Professional)

Researchers involved in this project - Chercheurs participant au projet
O'Connell, Colleen; McGibbon, Chris; McCullum, Shane; Jones, Melony; Sexton, Andrew.

Abstract - Résumé
Importance - Approximately 67% of individuals with a spinal cord injury experience muscle spasticity, with the majority of these individuals requiring medications to control it. Spasticity interferes with activities of daily living, causes pain, and results in decreased functional independence. Anti-spasticity medications can cause sedation, impaired cognition, and disruption of bowel and bladder function. Effective non-pharmacologic interventions are clearly needed.
Objectives - To measure the time-response of a standard FES cycling dose and monitor the effects over a 24 hour period.
Methods - Spasticity will be measured at 7 intervals over a 30 hour period, starting 4 hours prior to the FES cycling session and ending 24 hours after the cycling session. The main outcome measure is the relaxation index which is measured using a portable Pendulum Test System which has been developed at the Institute of Biomedical Engineering at UNB-Fredericton. Secondary outcome measures include the Modified Ashworth Scale and Numerical Rating Scale.
Results - These are the preliminary results after 5 of 10 subjects have been recruited. The relaxation index (RI) is a quantity used to measure spasticity using the IBME pendulum test system. An RI between 1.5-1.8 is normal, between 1.0-1.5 shows mild spasticity, and between 0-1.0 is indicative of severe spasticity. The average change for the right leg from immediately before the cycling session to right after the session is +0.448 and for the left leg is +0.288. This would a show a trend towards improvement in spasticity after the FES session.
Title of the research project - Titre du projet de recherche
Assessing the Risk of Lyme Disease in New Brunswick

Poster presenter - Nom de la personne qui présentera l'affiche
Corey Filiaggi

Researchers involved in this project - Chercheurs participant au projet
Filiaggi, Corey; Harris, Kami; Lloyd, Vett.

Abstract - Résumé
Background: Lyme borreliosis (LB), commonly known as Lyme disease, is an emerging disease in New Brunswick and is the most common arthropod-vectored zoonosis in North America. Ticks of the Ixodes genus feed on a wide range of hosts including humans and other mammals, and can transmit pathogens, so therefore they can have an impact on public health. Borrelia burgdorferi is a spirochete bacteria which is the causative agent of Lyme disease, and can be transmitted through the bite of Ixodes ticks. Objective: To determine the proportion of Ixodes ticks in New Brunswick that are infected, and compare the results from ticks collected in 2012 and 2013 to see if the risk of Lyme disease is increasing, decreasing, or stable. Methodology: Ticks were collected by passive surveillance from veterinary practices, silviculture workers, conservation field officers and members of the general public across the province. DNA was extracted from the ticks and the presence of Borrelia DNA determined by nested PCR for both the OspA and FlaB genes. Results: We found that the overall infection rate for ticks collected in 2012 was 44%, which is much higher than previously reported rates for Canada. Also, about 7 times more ticks were received in the summer months of 2013 compared to 2012, even though the collection methods remained the same, which indicates that the tick populations in NB are increasing. Significance: Our results indicate that ticks and Lyme disease are an increasing, public health concern in New Brunswick and the rest of Canada.

Title of the research project - Titre du projet de recherche
A One Year Pilot Study of Circuit Class Outcomes in Outpatient Neurological Population

Poster presenter - Nom de la personne qui présentera l'affiche
Shane McCullum (Health Professional)

Researchers involved in this project - Chercheurs participant au projet
McCullum, Shane; Jones, Melony; Leroux, Meghan; de Passille, Erica.

Abstract - Résumé
Importance - Circuit class physiotherapy has been widely studied in the stroke population, but there is a lack of evidence for other neurologic diagnoses. Various barriers have been found for physical activity among persons with disability, including the environment, economic issues, equipment, and availability of resources. It is our hope that with guidance from trained therapists, these barriers to exercise can be overcome, allowing patients to become more physically active in the community.

Objectives - To determine whether circuit class therapy has benefits for overall conditioning for persons in the outpatient neurological population.

Methods Used - Subjects will come to the Stan Cassidy Centre to participate in a one hour group circuit class twice weekly for 8 weeks. Each class consists of 4 circuits: Leg strengthening, arm strengthening, balance and cardio. Outcome measures are obtained at baseline, after the 8 weeks of class, and 3 months post-class.

Results - This study is ongoing through until February 2014. Preliminary results are as follows for pre-class to post-class (averages): Timed up and go improved from 11.03s to 9.65s. Six-minute walk test distance increased from 323.3m to 359.1m. Community Balance and Mobility scale scores increased from 31.2 to 40.2 (out of 96). Muscle strength increased for all arm and leg muscles assessed. Walking speed was increased from 1.15 to 1.34 (metres/second). At the 3 month follow-up, subjects have either maintained, or continued to make improvements on all outcomes.
IMPLEMENTING REMINDER STRATEGIES TO INCREASE RATES OF POSTPARTUM GLUCOSE TESTING

Poster presenter - Nom de la personne qui présentera l'affiche
Kean, Terri/Nowe-Matheson, Bonita

Researchers involved in this project - Chercheurs participant au projet
Kean (health professional & PhD student), Terri; Nowe-Matheson (health professional), Bonita.

Abstract - Résumé
Background: Women with Gestational Diabetes Mellitus (GDM) are at risk of developing type 2 diabetes post pregnancy, yet an alarming number of women forego postpartum glucose testing. The purpose of this study was to examine the rate of postpartum glucose testing in women with pregnancies complicated by GDM in the Saint John Zone of Horizon Health Network and determine whether a post-delivery reminder would increase the rate of postpartum glucose testing. Method: This RCT utilized retrospective and prospective cohorts of women referred to the Diabetes in Pregnancy Clinic at the Saint John Regional Hospital (SJRH) whose pregnancies were complicated by GDM. The participant data was divided into four groups; (1) Retrospective data: pre 2008 guidelines. (2) Retrospective data: two years of CDA guidelines without added reminder strategy (4) Prospective data: > two years of CDA guidelines with added reminder strategy. Results: Final data analysis is currently underway. Arm 1 & 2 indicate post partum glucose testing was near non-existent. Data analysis will indicate whether an increase in postpartum testing occurred in the groups who received a reminder. Overlaid in this is the influence of 2008 CDA guidelines. This study emphasizes the importance of the early detection of diabetes as a means of optimizing patient outcomes and improving quality of life for persons living with diabetes. Further research will examine the perceived impact of CDA guidelines on the practice decisions of primary care providers.
Title of the research project - Titre du projet de recherche
A contemporary methodology for rapid health care policy-making through semantic aware open data
(Une méthode moderne pour définir rapidement des politiques en soin de santé grâce à l'utilisation de données sémantiques ouvertes)

Poster presenter - Nom de la personne qui présentera l'affiche
Syed Ahmad Chan Bukhari

Researchers involved in this project - Chercheurs participant au projet
Baker, Christopher.

Abstract - Résumé
It is widely accepted that health policy making is a time-consuming and laborious process because of its intersectoral nature and predominantly, lack of appropriate data format which is required for comprehensive need assessment. Whereas, statistical data, in particular health census data released by a government holds valuable information which can be utilized for critical needs assessment in public health policy and the development of health services. However, the Canadian health census data which has been released is primarily in legacy data formats (e.g. csv, txt and etc.) which discourage its rapid manipulation for critical decision making. We have adopted a contemporary methodology to republish the Canadian health census data as LOD (Linked Open Data) which is a W3C recommended flexible and interoperable standard based on RDF (Resource Description Framework) to promote its instant consumption in policy making. In our methodology, we incorporated well known semantic web vocabularies to expose the health data compatible with LOD schema. This way of semantic vocabularies integration with health census data not only supports stable automatic linkage with the LOD cloud, but it also enhances the quality and interoperability of the data. Furthermore, we have provided an LOD explorer interface and a SPARQL endpoint to facilitate the data seekers in finding target data for reuse in mashups and the creation of comparative analyses. This initiative will enhance access to data that is already "open", serving as an easy to use portal and information conduit for interested stakeholders in understanding health data and policy.

Il est généralement accepté que la définition des politique en santé est un processus long et laborieux à cause de sa nature intersectorielle et, surtout, par l’absence de données au format approprié nécessaire à la compréhension des besoins. Toutefois, les données statistiques, et plus particulièrement les données du recensement canadien en santé, contiennent des informations de grande valeur pouvant être utilisées afin de définir les politiques en santé publique et pour assister le développement des services de santé. Cependant, les données du recensement canadien en santé qui ont été publiées sont disponibles dans des formats variés (csv, txt, etc.) ce qui rend difficile leur exploitation afin de prendre des décisions critiques. Nous avons adopté une méthode contemporaine pour publier les données du recensement canadien en santé en tant que données liées ouvertes (LOD), un standard du W3C qui facilite l’interopérabilité et qui est basé sur l’utilisation du RDF le cadre de référence du web sémantique. Cette approche facilite grandement la consommation des données dans le cadre de la prise de décision. Dans le cadre de notre méthode, nous utilisons des vocabulaires sémantiques bien connus pour exposer les données du recensement dans un format compatible avec les schémas du LOD. En ajoutant des vocabulaires sémantiques aux données du recensement, nous favorisons les liaisons avec des ressources du nuage LOD, mais aussi nous améliorons la qualité des données et nous augmentons leur potentiel d’interopérabilité. De plus, nous fournissons une interface permettant d’explorer l’espace de données sémantiques ainsi qu’un point de service SPARQL qui permet l’extraction de données dans le but
Title of the research project - Titre du projet de recherche
Nursing Staff Perspectives of Their Work Environment

Poster presenter - Nom de la personne qui présentera l'affiche
Roberta Clark

Researchers involved in this project - Chercheurs participant au projet
Yetman, Linda; Keeping-Burke, Lisa; Clark, Roberta; Kinney, Brenda; MacNeill, Donna; Lydon, Betty; Gass, Wanda; Goguen, Stehpanie.

Abstract - Résumé
Nursing staff in today’s health care system need a supportive environment in order to practice effectively. This mixed method study used Appreciative Inquiry to examine the perspectives of nursing staff members on two acute care units in a large tertiary care hospital. After receiving ethical approval, focus group interviews were conducted over a 3-month period. Twenty-three registered nurses and licensed practical nurses participated and described what made their unit a good place to work. Further to this, participants completed the Practice Environment: Nursing Work Index (Lake, 2002), a 31-item measure for assessing nurses’ perspectives of their work environment. Results revealed that nursing staff members strive to provide high quality nursing care within an environment consistently plagued with insufficient staffing, inadequate equipment, and increased computerized documentation requirements. In the face of such contextual challenges, nursing staff described how they work to “create predictability amongst chaos” through developing supportive relationships, focusing on regimens for procedures and tasks, and maintaining routines. They also created structures to support personal coping with good communication, through positive teamwork, and by valuing the availability of strong managers, leaders, and/or mentors. The seven-member research team conducting the study represented nursing from: university, college, regional health authority and union organizations. This poster presentation will outline the research process and findings.
Title of the research project - Titre du projet de recherche
The role of key methylarginine residues in cytoplasmic hnRNP A1 function

Poster presenter - Nom de la personne qui présentera l'affiche
Michael Wall

Researchers involved in this project - Chercheurs participant au projet
Wall (Postdoc), Michael; Lewis, Stephen.

Abstract - Résumé
Heterogeneous nuclear ribonucleoprotein A1 (hnRNP A1) is a multifunctional RNA-binding protein involved in alternative splicing, mRNA transport and metabolism, and protein translation. HnRNP A1 has also been associated with the development and progression of cancer. However, the mechanisms that regulate hnRNP A1 cytoplasmic function are not yet fully understood. Arginine methylation is a posttranslational modification that can alter protein function and has been recognized as an important area of research in cancer biology. HnRNP A1 is a major target of arginine methylation, though little is understood about the biological impact of this modification at the cellular level. To study the role of arginine methylation in hnRNP A1 function, we created a mutant of hnRNP A1 with six methylarginines mutated to alanine in its glycine-rich domain. Using in vivo techniques in cultured cell lines, we showed that the methylarginine-deficient mutant of hnRNP A1 lacks several cytoplasmic activities, including protein translation and general mRNA binding. In addition to its role in translation, hnRNP A1 associates with cytoplasmic foci termed stress granules during cellular stress. Using immunofluorescent microscopy, we showed that loss of methylarginine residues reduces association of mutant hnRNP A1 with stress granules and inhibits their formation in a dominant negative manner. Our research demonstrates that methylarginine residues of hnRNP A1 have an important impact on its functions related to regulating proteins involved in cell death and the cells ability to respond to stress stimuli. This work may have an impact on our understanding of cancers associated with dysregulation of hnRNP A1.
Title of the research project - Titre du projet de recherche
The effect of routine post-operative amiodarone on the incidence of post-operative atrial fibrillation

Poster presenter - Nom de la personne qui présentera l'affiche
Kelan G. Kennedy, M.Sc (Undergraduate medical student)

Researchers involved in this project - Chercheurs participant au projet
Yip, Alexandra; MacLeod, Jeffrey; Hassan, Ansar; Forgie, Rand.

Abstract - Résumé
Background: Postoperative atrial fibrillation (POAF) is associated with increased morbidity and mortality in patients undergoing cardiac surgery. The purpose of this study was to determine whether routine postoperative administration of amiodarone reduced the incidence of POAF.

Methods: We performed a retrospective analysis of 422 consecutive heart surgery patients undergoing non-emergent, on-pump isolated coronary artery bypass graft (CABG), isolated valve, or combined CABG valve surgery, by a single surgeon, from January 2010 through September 2012. Patients with pre-existing atrial fibrillation were excluded. We compared patients who received post-operative amiodarone (n=98) with those who did not (n=324) on the basis of baseline and intra-operative variables as well as in-hospital postoperative adverse events. The primary outcome of interest was incidence of new-onset POAF.

Results: Baseline and intra-operative characteristics between the two groups were similar, except that patients in the amiodarone group were more likely to have a body mass index ≥30kg/m2 (44.9% vs. 33.0%, p = 0.04) and to leave the operating room on inotropic support (25.5% vs. 14.2%, p = 0.009). Unadjusted rates of POAF did not differ between the two groups (36.7% vs. 43.5%, p=0.23). However, following adjustment for differences in baseline characteristics, postoperative amiodarone had a protective effect against POAF (OR 0.54, 95% CI 0.33-0.91, p = 0.02). Conclusion: Postoperative amiodarone reduced the incidence of POAF in patients undergoing cardiac surgery. We recommend that amiodarone be administered routinely in order to decrease the adverse consequences of POAF.
Title of the research project - Titre du projet de recherche
A novel cloud-based approach to accessibility and sharing of data in physical medicine and rehabilitation

Poster presenter - Nom de la personne qui présentera l'affiche
Andrew Sexton

Researchers involved in this project - Chercheurs participant au projet
McGibbon, Chris; Sexton, Andrew; Morris, Craig; Broad, Aaron; Foran, Andrew; O'Connell, Colleen.

Abstract - Résumé
Objective sensor-based measurements are becoming increasingly common in health monitoring and provision of care. Only recently has this approach been considered for physical medicine and rehabilitation (PM&R) applications. PM&R assessments require therapist interaction with the client, but require objective instruments to ensure standardized and reliable assessments. The added value of quantitatively assessing important PM&R outcomes for complicated neurological conditions, such as brain injuries, spinal cord injury, multiple sclerosis and cerebral palsy, is this ability to “share” the accumulated knowledge among treating professionals. The BioTonetm system was developed by UNB-IBME, who is partnering with Accreon Inc. to develop a system to address this current lack of knowledge transfer capacity in the PM&R treating professions. The term “Cloud Computing” is used to describe software services available via the Internet. The BioTone Cloud provides a customizable synchronization mechanism to aggregate the raw and statistical data for multiple BioTone installations. This data will be available to authenticated users via web applications and a BioTone Cloud API allowing users to access predefined queries and functionality in addition to custom requests. The system utilizes several leading-edge open source technologies to provide data access. All application level software and API’s are developed using Ruby. MySQL Server provides the database core while web services are implemented via the Apache HTTP server. Several layers of security protect the BioTone Cloud with all communication between the application and the cloud secured via SSL and authentication is achieved via secure, encrypted usernames and passwords. The practical implementation and application of this development is presented.
Title of the research project - Titre du projet de recherche
Prevalence of Disordered Eating in Male University Students

Poster presenter - Nom de la personne qui présentera l'affiche
Stefanie Ciszewski (graduate student)

Researchers involved in this project - Chercheurs participant au projet
Best, Lisa; Ciszewski (graduate student), Stefanie; Fanjoy (graduate student, Lillian; Woodland (graduate student), Jennifer; Shannon (graduate student), Amy.

Abstract - Résumé
Eating disorders (ED) are a food and eating psychopathology afflicting approximately 4% of the population (Sundgot-Borgen & Torsveit, 2004). Sub-threshold EDs are suggested to represent a larger proportion of the population than full threshold eating disorders (Favaro et al., 2003; Stice et al., 2009) and can result in a decreased quality of life (Wade et al., 2012). The prevalence of individuals at risk for an ED is notably high among university and college students (Wilfley et al., 2013) and Leichner et al. (1986) reported that 5% of males and 22% of females exhibited clinical levels of disordered eating. The purpose of this study was to examine the prevalence of disordered eating in a non-clinical of male university students. The sample was drawn from three separate studies conducted in our laboratory and male participants were selected. In total, we have data for 155 males (Mage=20.98 years, SD=4.77 years). The BMI of participants ranged from 16.70 to 40.40 (MBMI=24.80, SD=4.16) and 15.5% (N=24) had EAT-26 scores above the clinical cut-off. As would be expected, symptomatic participants had higher Oral Control (p=.0001), Dieting (p=.0001), Bulimia (p=.0001), and Total EAT-26 scores (p=.0001). Interestingly, only the Dieting subscale score was significantly correlated with BMI (r=.161 p=.042). These results highlight that the prevalence of disordered eating among males may be higher than initially suggested. Furthermore, the fact that symptomatic and nonsymptomatic students had similar BMIs suggests that, at least for males, it is possible to have patterns of disordered eating while maintaining a normal weight.
Title of the research project - Titre du projet de recherche
MicroRNA profiling by next-generation sequencing: Identification of VHL-regulated miRNA in Renal Cell Carcinoma. Profil d'expression de microARNs par séquençage à haut débit : Identification de microARNs régulé par le gène von Hippel-Lindau dans les tumeurs rénales

Poster presenter - Nom de la personne qui présentera l'affiche
Sonia Dastous

Researchers involved in this project - Chercheurs participant au projet
Dastous, Sonia; Crapoulet, Nicolas; Cormier, Kevin; Ouellette, Rodney; Turcotte, Sandra.

Abstract - Résumé
Introduction. It is estimated that 5,900 Canadians will be diagnosed with kidney cancer this year and 1,740 Canadians will die of this disease. At advance stages, Renal Cell Carcinoma (RCC) are particularly challenging since they are resistant to radiation and cytotoxic therapies. The survival rate after 5 years is less than 10%. There is a need to develop new targeted approach to treat RCC. Inactivation of the von Hippel-Lindau protein (VHL) tumor suppressor gene is a common (up to 85%) and early event in the development of RCC. We showed that targeting the loss of VHL could be a promising therapeutic strategy. MicroRNAs are non-protein coding small RNA molecules that negatively regulate gene expression by inhibiting mRNA translation. Deregulated microRNA have been associated with proliferation, carcinogenesis and metastasis. Objective. We investigated the VHL-dependent regulation of microRNA in RCC. Methods. microRNA profiling have been performed by next-generation sequencing. Taqman probes and qRT-PCR have been used to validate the expression of candidate microRNA in different RCC cell lines. Bioinformatic analysis indicated potential targets of these microRNA. Results. Our results identified 35 mature microRNA that are dysregulated in VHL-deficient RCC4 cells compared to the cells with the functional gene. Target prediction analysis indicated that several of these miR are involved in RCC. miR-210, miR-152, miR-218 and miR-9 are the most highly expressed in VHL-deficient RCC4 cells and have been validated in 786-0 and RCC10 models. Conclusion. Our study identified VHL-regulated microRNA and predictive target genes to provide new insights into RCC oncogenesis.

Introduction. Environ 5,900 Canadiens seront diagnostiqués avec le cancer du rein cet année et 1,740 mourront de cette maladie. Il n’y a pas de thérapie efficace pour traiter le carcinome rénal à cellules claires (RCC) de stade métastatique. Le taux de survie après 5 ans est moins de 10% démontrant le besoin de développer de nouvelles approches pour traiter ces tumeurs. L’inactivation du gène de suppression tumoral von Hippel-Lindau (VHL) est un événement commun et précoce dans le développement des RCC. Nous avons préalablement démontré que cibler l’inactivation de VHL pourrait mener à une stratégie thérapeutique prometteuse. Les microARNs sont des petits ARN non-codant qui régulent négativement l’expression des gènes. La dérégulation de microARN est observé dans plusieurs tumeurs. Objectif. Cette étude a pour but d’identifier des microARNs dont la régulation est VHL-dépendante. Méthodes. Un profil d’expression des microARN a été effectué par séquençage à haut débit sur des cellules déficientes en VHL et sur leur contrepartie dont VHL est actif. Les microARNs sélectionnés ont été validés en utilisant des sondes Taqman et la qRT-PCR. Résultats. Nous avons identifié 35 microARNs dont l’expression variait dans les cellules déficientes en VHL comparativement aux cellules positives pour VHL. Des cibles prédites pour plusieurs de ces microARNs sont impliqués dans les RCC. Mir-210, mir-152, mir-218, et mir-9 sont les plus hautement exprimés dans les RCC4 déficientes en VHL. Conclusion. Cette étude identifie des microARN qui sont régulés par VHL lequels pourraient être important pour le diagnostique ou une nouvelle thérapeutique pour les RCC.
Title of the research project - Titre du projet de recherche
An investigation of the effectiveness of diagnosis and treatment of Lyme disease in New Brunswick

Poster presenter - Nom de la personne qui présentera l'affiche
Emma Wilson-Pease

Researchers involved in this project - Chercheurs participant au projet
Lloyd, Vett; Wilson-Pease, Emma.

Abstract - Résumé
Overview: Lyme borreliosis (LB), commonly known as Lyme disease, is a serious tick-borne illness that is, as the most common zoonosis in North America, becoming increasingly prevalent across Canada. The spirochete bacteria Borrelia burgdorferi is the causal agent of this illness, although other bacteria introduced as co-infections play an important role in the nature and severity of clinical symptoms. In Canada, official recognition as a case of LB requires a positive ELISA test followed by a Western immunoblot test with five of ten possible IgG bands detected or a clinical diagnosis based on the presence of an erythema migrans (EM) rash and exposure in an area known to harbour endemic tick populations. Both patients’ rights groups and researchers have challenged the stringency of these criteria for diagnosis, and the attendant access to treatment. Objectives and methodology: To assess the adequacy of these diagnostic criteria in New Brunswick, we interviewed people who self-identified as having Lyme disease. Results: Although preliminary, results showed that when criteria from Public Health are used to diagnose Lyme disease, only two out of the fourteen participants would have been diagnosed as having Lyme disease. Of the remaining 12, ten had sought treatment outside of the province and had improved or had their disease resolved, whereas the two who have not received treatment continue to experience chronic disease. Importance: This finding is consistent with the marked discrepancy in Lyme diagnoses in Northern United States compared to Southern Canada, which suggests that many treatable infections are not currently being diagnosed and treated.

Aperçu: La borréliose de Lyme (BL), communément appelée maladie de Lyme, est une maladie sérieuse transmise par les tiques. Il s’agit de la zoonose la plus commune en Amérique du Nord et elle devient de plus en plus courante à travers le Canada. La bactérie spirochète Borrelia burgdorferi est l’agent qui cause cette maladie, bien que d’autres bactéries qui s’introduisent en même temps (co-infections) jouent un rôle important quant à la nature et à la sévérité des symptômes cliniques. Au Canada, le diagnostic de la maladie de Lyme requiert soit un test ELISA positif suivi d’un test Western Blot avec 5 bandes IgG détectées sur 10, soit un diagnostic clinique basé sur la présence d’érythème migrant (EM) et d’une exposition dans une région connue pour abriter des populations de tiques. Les groupes de soutient aux patients et les chercheurs remettent en question la rigueur des critères de diagnostic et l’accès aux soins des individus concernés. Objectifs et méthodologie: Pour déterminer si les critères de diagnostic sont adéquats au Nouveau-Brunswick, nous avons interviewé des personnes qui se sont auto-identifiées comme étant atteintes de la maladie de Lyme. Résultats: Bien que préliminaires puisque l’étude se poursuit, les premiers résultats montrent que seulement 2 des 14 personnes interrogées auraient été diagnostiquées atteintes de la maladie de Lyme. Des 12 personnes restantes, dix ont été traitées en dehors de la province et ont vu leur état s’amélioré ou leurs symptômes disparaître. Les deux personnes qui n’ont pas reçu de traitement continuent de ressentir les symptômes de la maladie de façon chronique. Importance: Cette découverte confirme une divergence considérable entre les tests diagnostiques effectués pour la maladie de Lyme dans le Nord des États-Unis et dans le sud du Canada, et suggère que de nombreuses infections traitables pourraient être diagnostiquées et traitées.
traitées.
Assessing hybridization between I. cookei and I. scapularis as a factor in the spread of Lyme disease in New Brunswick

Poster presenter - Nom de la personne qui présentera l'affiche
Anna Duncan

Researchers involved in this project - Chercheurs participant au projet
Harris, Kami; Filiaggi, Corey; Lloyd, Vett.

Abstract - Résumé

Background: Lyme disease is caused by the spirochete bacterium Borrelia burgdorferi vectored by the Ixodes ticks. In New Brunswick, Ixodes scapularis is the only tick species taken into consideration with respect to Lyme disease modelling and control efforts. However, the incidence of Borrelia infection has been observed to be at levels not expected until the year 2020. Objective: To determine if there are other tick species carrying and transmitting this disease. Methods: Samples of closely the related Ixodes tick, Ixodes cookei collected by passive surveillance in 2012 and 2013 throughout New Brunswick. Their host animal (companion animal vs human) was determined from submission information and Borrelia infection status determined by nested PCR. Morphometrics of key characters (palp, hypostome, scutum size and shape) was used to assign species, with confirmation by CO1 barcoding. Hybridization will then be assessed by sequencing the nuclear 28S gene. Results: Multiple cases of Ixodes cookei with Borrelia were collected from humans as well as animals, showing that Ixodes cookei can carry Borrelia and has a broad host range. Morphological assessment of the ticks showed intermediate morphologies for a number of characters (palp length, hypostome length, palp to hypostome length, and scutum shape) supporting the possibility of hybridization. Confirmation by sequencing of nuclear genes is in progress. Significance: This work suggests that I. cookei may need to be re-assessed as a vector of Lyme disease.
Title of the research project - Titre du projet de recherche
Describing experiences and consequences of workplace bullying for men using video dissemination

Poster presenter - Nom de la personne qui présentera l'affiche
Sue O'Donnell, RN, MN, PhD(c)

Researchers involved in this project - Chercheurs participant au projet
O'Donnell, Sue.

Abstract - Résumé
Workplace bullying is a serious workplace health issue characterized by persistent and repeated offensive, unsafe, unwanted, degrading, or intimidating behaviours and the abuse of power and control. Although both men and women are bullied, surprisingly, few researchers have examined men’s experiences. To address this gap, a qualitative grounded theory method was used to interview a community sample of 20 Atlantic Canadian men with diverse employment experiences and backgrounds who experienced bullying. Findings demonstrate that men experience physical, emotional, and social health consequences and, contrary to prevailing knowledge and assumptions related to men’s health and help seeking behaviours (i.e., overall men are less likely than women to seek help, particularly for their health), men want support and many seek help to address the problem and its consequences. Another important finding is that men do not always immediately recognize experiences as bullying and may blame themselves; a response that negatively impacts health. For this reason, raising awareness is critical. Because of the potential to reach a vast and diverse audience, I have created a video to communicate these findings. Because targets, including the men in this study, turn to online resources for help, and I have been unable to locate any evidence based videos, this dissemination activity is important. Use of video format can convey the impact of this experience on men’s health and lives in a way that a list of consequences, presentation, or manuscript cannot. This poster presentation will incorporate a short video trailer as a sample of the findings.
Title of the research project - Titre du projet de recherche
Actions antiprolifératives du Fucoxanthine et de son métabolite, le Fucoxanthinol, sur les cellules du cancer du sein. Antiproliferative effects of Fucoxanthine and of its metabolite, Fucoxanthinol, on breast cancer cells.

Poster presenter - Nom de la personne qui présentera l'affiche
Arlette Rwigemera

Researchers involved in this project - Chercheurs participant au projet
Rwigemera, Arlette; Martin, Luc J.

Abstract - Résumé
L'un des importants axes de recherche sur le cancer du sein est l’inactivation de la voie de signalisation NF-κB. Cette voie est impliquée dans les réponses immunitaire et inflammatoire, ainsi que dans le mécanisme d’apoptose, qui sont altérées chez les cellules cancéreuses. Le Fucoxanthine (Fx) est un caroténoïde abondant dans les macro-algues brunes et peut être métabolisé en Fucoxanthinol (Fxol) dans le tractus gastro-intestinal. Ces composés sont connus pour réduire la viabilité et induire l’apoptose des cellules cancéreuses de la prostate et du côlon. Cette recherche vise à comparer les effets du Fx et Fxol sur la viabilité, l’apoptose et l’activation de la voie NF-κB chez deux lignées de cellules du cancer du sein, les MCF-7 et les MDA-MB-231. Pour y parvenir, les cellules sont exposées à des doses de Fx/Fxol et des temps de traitement différents. La viabilité est mesurée par fluorescence. L'analyse protéique est faite par Western blot. Nos résultats montrent une baisse de la viabilité des cellules et une augmentation de l’apoptose en réponse à des doses et des temps d’exposition croissants de Fx et Fxol. Pour les résultats d’analyses protéiques, plusieurs changements d’expression des composantes de la voie NF-κB ont été observés (p65, c-Rel, Rel-B). Ces résultats suggèrent que l’apoptose des cellules du cancer du sein est particulièrement induite par le Fxol en régulant l’expression des composantes de la voie de signalisation NF-κB. Cette étude permettra d’éclaircir le mécanisme d’action du Fx et du Fxol ainsi que le rôle de NF-κB chez le cancer du sein.

One of the most important axis of research in breast cancer is the inactivation of NF-κB pathway. That pathway is involved in immune and inflammatory responses as well as apoptosis. These processes are altered in cancerous cells. Fucoxanthin (Fx) is a carotenoid abundant in brown seaweeds and can be metabolized into Fucoxanthinol (Fxol) in the gastrointestinal tract. These compounds are known to reduce viability and induce apoptosis in prostate and colon cancer cells. The purpose of this research is to compare the effects of Fx and Fxol on the viability, apoptosis and NF-κB pathway activation in two breast cancer cell lines, MCF-7 (hormone dependant) and MDA-MB-231 (hormone independent). Therefore, cells were exposed to increasing doses of Fx/Fxol for different periods of time. Viability was measured by fluorescence and protein analysis was done by Western blot. Our results show that viability of treated cells is reduced whereas apoptosis is increased in response to increasing doses and exposure times of Fx/Fxol. In all studies, Fxol has more pronounced effects than Fx. Protein analysis in Western blot reveals several changes in the expression of NF-κB family members (p65, c-Rel, Rel-B). These results suggest that apoptosis of breast cancer cells is induced by Fxol through regulation of members of NF-κB pathway. This study will contribute to a better understanding of the mechanism of action of Fx and Fxol and the role of NF-κB in breast cancer cells.
Title of the research project - Titre du projet de recherche
Effects of the adipose derived hormone adiponectin on steroidogenesis in testis Leydig cells / Influence de l'adiponectine, une hormone dérivée du tissu adipeux, sur la stéroïdogenèse au niveau des cellules de Leydig du testicule

Poster presenter - Nom de la personne qui présentera l'affiche
David Landry

Researchers involved in this project - Chercheurs participant au projet
Landry, David; Paré, Aurélie; Martin, Luc J..

Abstract – Résumé
Obesity in men is associated with lower testosterone levels, related to reduce sperm concentration. Adiponectin is produced by adipocytes and its circulating level is indirectly proportional to total body fat. Adiponectin receptors (AdipoR1 and AdipoR2) have been found to be expressed in testicular Leydig cells (producing testosterone). Since StAR and Cyp11a1 are essential for testosterone synthesis and adiponectin has been shown to regulate StAR mRNA in swine granulosa cells, we hypothesized that adiponectin might also regulate these genes in Leydig cells. Our objective was to determine whether adiponectin regulate StAR and Cyp11a1 genes in Leydig cells line and to better define its mechanisms of action. Method uses in the current study are Elisa for the progesterone concentration, Western Blot for the protein quantification, qPCR for the mRNA levels and transfection for promoter activities. We have found that adiponectin partly antagonizes the cAMP-dependant stimulation of mouse Cyp11a1 mRNA expression and StAR protein levels in MA-10 Leydig cells. Moreover, adiponectin regulates StAR promoter activity in a dose-dependent manner in MA-10 cells as demonstrated by transfection of a luciferase reporter plasmid. Thus, our data provide molecular evidences of obesity-mediated regulation of testosterone production in Leydig cells. A clear explanation of this mechanism of action will definitely contribute to better define the implications of an increasing obesity level in our society.

Chez l'homme l'obésité est associée à une réduction des concentrations de testostérone et de sperme. L'adiponectine est une hormone produite par le tissu adipeux et sa concentration plasmatique est inversement proportionnelle à la masse totale de tissu adipeux. La présence des récepteurs à l’adiponectine (AdipoR1 et AdipoR2) a été démontrée chez les cellules de Leydig produisant la testostérone au niveau du testicule. Puisque StAR et Cyp11a1 sont des protéines essentielles pour la synthèse de testostérone et que l’adiponectine est capable de réguler l’expression de StAR chez les cellules de la granulosa du porc, nous supposons que l’adiponectine pourrait influencer ces gènes chez les cellules de Leydig. Notre objectif était de démontrer si l’adiponectine régule l’expression de StAR et de Cyp11a1 et de définir son mécanisme d’action. Les méthodes utilisées lors de cette étude son l’Élisa pour évaluer la
concentration en progestérone, le Western Blot pour quantifier les protéines, le PCR en temps réel pour évaluer le niveau de ARNm et les transfections pour l’activité promotrice de nos gènes. Nos résultats démontrent que l’adiponectine réprime partiellement la stimulation dépendante par l’AMPc du gène Cyp11a1 chez les cellules de Leydig de type MA-10 au niveau de l’ARNm ainsi que StAR au niveau protéique. De plus, l’adiponectine régule l’activité du promoteur StAR de façon dose-dépendante dans les cellules MA-10 tel que démontré par transfection avec un plasmide rapporteur de luciférase. Ainsi, nos résultats fournissent des preuves moléculaires de l’impact de l’obésité sur la régulation de la production de testostérone chez les cellules de Leydig. La compréhension du mécanisme d’action de l’adiponectine chez les cellules de Leydig contribuera à mieux définir les impacts de l’obésité qui ne cesse d’augmenter dans notre société.
Abstract - Résumé
Background: Lyme borreliosis (LB), commonly known as Lyme disease, is the most common tick-vectored zoonosis in North America and an emerging disease in New Brunswick. The causative agent is infection with the spirochete bacterium Borrelia burgdorferi. Most first tier diagnostic tests are based on detection of antibodies to whole cell extracts of the canonical B31 strain of Borrelia burgdorferi, a clonal isolate from one of the original Lyme-disease ticks identified in the 1970s. However, other strains and genospecies of Borrelia have since been documented in both the United States and Canada and it is unclear if the commonly used ELISA and immunoblotting (Western blot) diagnostics will detect these variants. Objective: To determine the frequency of variant strains and genospecies of Borrelia in New Brunswick. Methodology: We sequenced amplicons spanning polymorphic regions of the outer surface protein A (OspA), flaggelin B (FlaB) and intergenic spacer (igs) region of the nuclear rDNA region of Borrelia-infected ticks. Results: We found that in addition to the B31 strain, the N40 strain of B. burgdorferi is also common in New Brunswick. We also found hybrid B31/N40 sequences. Additionally, we also found evidence of the newly described Borrelia miyamotoi genospecies in New Brunswick ticks. Significance: There is considerable diversity in the genotypes of Borrelia strains and species present in New Brunswick ticks, which may pose a significant challenge in detection by traditional serological diagnostics.
The effect of HDAC6 inhibition on breast cancer cell behaviour

Poster presenter - Nom de la personne qui présentera l'affiche
Amy Brown

Researchers involved in this project - Chercheurs participant au projet
Brown, Amy; Pinkham, Ryan; Cuperlovic-Culf, Mira; Culf, Adrian; Lloyd, Vett.

Abstract - Résumé
Many types of tumour cells, such as prostate, breast and colon, have shown aberrant histone hypoacetylation, due to increased activity of histone deacetylases (HDACs) which affects chromatin modelling. Multiple HDACs are upregulated in breast cancer cells, including HDAC1, 2 and 6, which can lead to the cancerous phenotype through inactivation of signals for cell cycle arrest, growth inhibition, apoptosis, and tumour suppressor gene expression. Current HDAC inhibitors (HDACi) have demonstrated some reversal of the cancerous phenotype, but are problematic in their delivery system, requiring high concentrations of the drugs. This research investigated the anticancer properties of a novel HDACi through viability tests and an invasion assay, using 2 malignant breast cancer cell lines, MDA-MB-231 and MCF-7 and 1 normal breast cell line, MCF-10A. This novel inhibitor is HDAC6 selective with an IC50 of HDAC1 of 1.9µM, HDAC of 2 5.7µM, and HDAC6 of 14.7nM. The novel HDACi was not strongly cytotoxic, producing reduced viability only at 100uM and 1000uM in both cancerous breast cell lines, and this reduction was not as pronounced as in the normal breast cell line. Preliminary results from an invasion assay indicate that 100uM of the novel HDACi reduce invasion capacity, with the greatest effect on MDA-MB-231 compared to MCF-10A, the normal breast cell line. These observations fit in well with the role of HDAC6 in promoting cellular motility. This research will provide insight into the potential of novel HDAC6 inhibitors in the inhibition of the cancerous phenotype, leading to further insight into a chemotherapy for breast cancer.
The Healthy Start Project: Promoting physical activity and healthy eating among 3 to 5-year old children in day care centres

Stéphanie Ward

Ward, Stephanie; Belanger, Mathieu; Leis, Anne; Humbert, Louise; Vatanparast, Hassan; Muhajarine, Nazeem; Froehlich Chow, Amanda; Reading, Stacey.

Abstract - Résumé

BACKGROUND: Canadian statistics show that among 2 to 5 year olds, 15.2% are overweight and 6.3% are obese. Early prevention is important as overweight and obesity are linked to health problems later in adulthood. Over 54% of young Canadians under the age of 5 spend close to 30 hours per week in licensed child care centres, making them key locations for promoting healthy lifestyles in young children. Healthy Start is a multilevel program that aims to increase physical activity and healthy eating opportunities of preschoolers in early learning centres. The project is currently being evaluated in 40 centres in Saskatchewan and New Brunswick. METHODS: The Healthy Start project is a randomized and controlled intervention. Measurements are taken at the beginning and at the end of the 2013-2014 and 2014-2015 school years. Physical activity levels of children are assessed using accelerometers, while their healthy eating behaviours are measured through a digital photography plate waste study and NutriSTEP, a parent-administered questionnaire. Physical activity- and healthy eating-related opportunities are measured using the NAP SACC environmental scan. Finally, parents and educators are answering a short questionnaire related to their own physical activity and healthy eating behaviours. DISCUSSION: Results from the Healthy Start project will show whether the promotion of healthier lifestyles is possible using simple, inexpensive and easily integrated activities and resources within the daily routine of children. The research team anticipates that the Healthy Start initiative will demonstrate positive effects on children’s and parents habits and overall health.

générale.
Title of the research project - Titre du projet de recherche
Nanoparticles for diagnostic imaging of pathophysiological processes: Theransotics in atherosclerotic lesions via radiofluorescent nanoparticles mimicking high-density lipoprotein (HDL) molecules

Poster presenter - Nom de la personne qui présentera l'affiche
Andrew J Chan

Researchers involved in this project - Chercheurs participant au projet
Chan, Andrew; Philip, Shona; Brunt, Keith

Abstract – Résumé
Molecular imaging is an every growing field that shows much potential for future clinical diagnostic applications. Existing diagnostic technologies such as positron emission tomography (PET) and nuclear medicine are highly sensitive but offer little in the way of spatial resolution. To contrast, modalities such as magnetic resonance imaging (MRI) and computed tomography (CT) can resolve structures up to 1mm but have poor sensitivity. Nanotechnology applied to clinical diagnostics can solve this sensitivity specificity paradox. The unique characteristics of nanoparticles include their extremely small size (<100nm) and their ability to mimic naturally occurring biological structures in the body such as HDL. When used as an image contrast agent, these properties allow for the targeting and imaging of specific bodily processes such as atherosclerotic lesions and other processes of inflammation. In this study, we intend to utilize fluorescent nanoparticles mimicking high density lipoprotein (HDL) molecules to determine their effectiveness and safety as a diagnostic tool. Nanoparticles that contain Curcumin or DirBOA, two known fluorescing agents, will be assessed for their dose dependent effects on cell viability via in vitro monitoring of human umbilical vein endothelial cells (HUVECS). The effects of DirBOA on human cells are largely unknown. Curcumin, however, has been well established to raise hemeoxygenase-1 (HO-1) levels for anti-atherosclerotic properties, though it’s value as a diagnostic agent has not been previously explored. Initial results from this study have shown that curcumin administered via nanoparticle delivery results in non toxic uptake by HUVECS.
Title of the research project - Titre du projet de recherché
Sentinel Surveillance and Effectiveness of 2012/13 seasonal influenza vaccines in the prevention of Influenza-related hospitalization in Canadian adults: a Public Health Agency of Canada/Canadian Institutes of Health Research Serious Outcomes Surveillance Network Study at the Moncton Hospital

Poster presenter - Nom de la personne qui présentera l'affiche
Natalie Wall

Researchers involved in this project - Chercheurs participant au projet
Wall, Natalie; Smyth, Daniel; on behalf of the Public Health Agency of Canada/Canadian Institutes of Health Research Serious Outcomes Surveillance Network Investigators.

Abstract – Résumé
Background: Viral influenza is well known to cause seasonal illness characterized by acute onset of fever, respiratory symptoms, fatigue and myalgia. Influenza is estimated to cause between 2,000-8,000 deaths and more than 20,000 hospitalizations annually in Canada. The goal of the Canadian influenza immunization program is prevention of influenza-associated hospitalization and death. Ongoing study and assessment of influenza vaccine effectiveness is critical for publicly funded immunization programs. Methods: In 2012/13, the PCIRN Serious Outcomes Surveillance Network conducted active surveillance for influenza among hospitalized adults from 15 Nov to 30 April in 45 acute care facilities in 7 provinces, including The Moncton Hospital, encompassing a total of ≈ 18,000 beds. Detailed clinical information, as well as nasopharyngeal swab for influenza PCR testing were obtained from all consenting patients admitted with influenza-like illness symptoms. Results: In the Moncton Hospital 27 cases (mean age, 75.9 y; range, 46-97) and 29 controls (mean age, 74.7 y; range, 41-93) were enrolled from a total of 105 subjects; 6 (22.2%) cases were between 65-75 and 16 (59.3%) were ≥ 75 years old; 100% of all cases and controls had ≥1 comorbidity with mean number of comorbidities of ≥3 for both cases and controls; 10 (37%) cases and 7 (24.1%) controls were obese; 18 (66.7%) cases and 26 (89.7%) controls had received the seasonal influenza vaccine; Average length of stay was 19.4 days (range, 3-96 d) for cases and 14.5 days (range, 2-68 d) for controls with 8 (29.6%) cases compared to 2 (6.9%) controls requiring ICU.
Abstract - Résumé
Mutations in the purine de novo synthesis pathway have been implicated in multiple human medical conditions, and the pathway has been the target of many anti-cancer drugs. Mutations affecting purine de novo synthesis in Drosophila melanogaster cause defects in the flies’ eyes, bristles, wings and legs. More severe mutations cause developmental arrest, often with development of necrosis in the developing wing and leg. In a previous study we found a link between caspase-mediated apoptosis and this mutant phenotype. These phenotypes do not appear dependent on p53 or the apoptosis effector genes reaper, grim and hid [1]. To explore further this link between reduced purine synthesis, developmental arrest, and apoptosis, we examined the effects of the Drosophila inhibitor of apoptosis protein 1 (DIAP1, or thread) on ade2 mutants deficient for purine de novo synthesis. Counter to our predictions, over-expression of DIAP1 enhances the developmental arrest and degree of necrosis, whereas under-expression of DIAP1 partially rescues both of these phenotypes. This result is leading us to explore the role of other caspase-independent pathways in the development of the purine synthesis phenotype. In addition to DIAP1, we explored the role of HtrA2, a mitochondrial serine protease that can activate DIAP1, in the purine synthesis phenotype. Reduced HtrA2 function did not significantly suppress the degree of necrosis; however, it suppressed the lethality of ade2 mutants. Our results suggest that HtrA2 has a role in mediating the developmental arrest in purine synthesis mutants. [1] Holland et al (2011) Genetics Jun;188(2):359-67
Title of the research project - Titre du projet de recherche
Retrospective analysis of topical and topical/systemic combined methods of Methicillin-resistant Staphylococcus aureus decolonization in a primarily ambulatory patient population

Poster presenter - Nom de la personne qui présentera l'affiche
Brandyn Chase

Researchers involved in this project - Chercheurs participant au projet
Chase, Brandyn.

Abstract - Résumé
Background: Methicillin-resistant S. aureus (MRSA) infections have been shown to result in increased morbidity, mortality, and healthcare costs when compared to methicillin-sensitive S. aureus infections. Prior research has shown that 10-60% of patients colonized with MRSA in acute care settings will develop an MRSA infection. One strategy aimed at reducing infection risk and potential transmission is decolonization to eradicate MRSA carriage, however, the most effective method of decolonization has not been established. Methods: This study is a retrospective review of a cohort of patients with laboratory confirmed MRSA carriage managed at the MRSA Ambulatory Clinic at the Saint John Regional Hospital (SJRH) from March 2008 to November 2012. Each attempt at decolonization was considered a separate event in the analysis and classified as receiving either topical or topical/systemic decolonization treatment. Each attempt was analyzed for both short-term and long-term clearance of MRSA colonization. Results: 419 decolonization attempts met the criteria for analysis. Kaplan-Meier curve analysis demonstrated better efficacy with topical/systemic treatment overall (X2=8.52, p=0.0035) and in patients with rectal colonization (X2=6.16, p=0.013). Patients with no rectal colonization were not found to derive the same benefit from topical/systemic treatment (X2=6.16, p=0.013). Discussion: Evidence from this retrospective review shows that decolonization is a useful tool for MRSA eradication with 33-48% of patients remaining MRSA-negative at 1 year post-treatment. Topical/systemic therapy, particularly in the setting of patients with rectal colonization, was shown to be of increased benefit in achieving initial and possibly maintaining long-term clearance as well.
Poster presenter - Nom de la personne qui présentera l'affiche
Melissa McKeon

Researchers involved in this project - Chercheurs participant au projet
Manson, Neil; Abraham, Edward; Elliott, Renee; McKeon, Melissa

Abstract – Résumé
Introduction: Percutaneous pedicle screw-rod instrumentation (PercStab) without direct decompression or fusion is a surgical option to manage thoracolumbar trauma. The current standard of care includes instrumentation removal following osseoligamentous healing, although, it is hypothesized that instrumentation removal is not necessary. Therefore the purpose of this study is to evaluate the utility of PercStab in the following areas: patient satisfaction, return of function, and need for repeat surgery.

Methods: A retrospective review identified patients receiving PercStab for trauma from January 2007- August 2011. Validated clinical outcome measures, demographics, peri-operative data, and the need for further surgery were assessed via clinical follow-up, chart review, and telephone interviews.

Results: 26 patients with a median Injury Severity Score (ISS) of 10 received PercStab to treat spinal instability and were followed for 22 months (range: 2m-4.5yrs). Minimal surgical morbidity was incurred: OR time: 90.5 minutes (40-183min), blood loss: 100cc (50cc-500cc), days to hospital discharge: 6 (1-37). Patients reported satisfaction: VAS back: 2 (0-8), VAS leg: 1 (0-7), ODI: 16 (0-54), average of 3 months to return to work. Patients scored an outcome satisfaction of 5 (3.75-5) out of 5 on a likert-type questionnaire. Only 4 patients required instrumentation removal: 2 for screw loosening causing pain, 2 for screw prominence causing discomfort with direct pressure.

Conclusion: This surgical option provides rapid mobilization and discharge from hospital with minimal surgical morbidity. Instrumentation removal should be considered on an individual basis. Further research is required to quantify the utility of this technique in comparison to traditional surgical options.
Title of the research project - Titre du projet de recherche
Post-Operative Creatinine Kinase Values as a Predictor of 1-Year Patient Reported Pain and Function Following Posterior Lumbar Interbody Fusion: Comparing Conventional Open Versus Minimally Invasive Techniques

Poster presenter - Nom de la personne qui présentera l'affiche
Brad Lewis (Medical Student)

Researchers involved in this project - Chercheurs participant au projet
Manson, Neil; Lewis, Brad; McKeon, Melissa; Green, Alana Green; Abraham, Edward

Abstract – Résumé

Methods: A prospective surgical database identified 91 patients and provided self-reported outcomes pre-operatively, 2, 6, 12 months post-operatively, demographic and operative data. A one-way ANOVA (p ≤ 0.05) was used to analyze post-operative values to detect differences between minimally invasive (MIS) and open (OPEN) techniques, surgical levels, CK, and follow-up data. A Pearson’s correlation was used to determine the relationship between CK and patient demographics, intra-operative measures, and follow-up questionnaires. Results: Sex was shown to affect CK with males displaying significantly higher CK values than females on both day 1/2 (p=0.00) and day 3/4 post-operatively (p=0.04). Although no sex differences were found in post-operative pain reporting, males showed a significant correlation with CK values and 6 month VAS-Leg scores (p=0.01; p=0.02). CK was correlated to height (p=0.00), weight (p=0.00) and BMI (p=0.04) on day 1/2 while only height and weight showed a significant correlation to CK (p=0.04; p=0.02) on day 3/4. Surgical groups did not significantly differ in follow-up pain and disability scores or CK. Conclusion: Early evaluation of post-operative muscle injury does not appear to correlate with 1-year post-operative outcome, regardless of surgical technique.
Title of the research project - Titre du projet de recherche

Poster presenter - Nom de la personne qui présentera l'affiche
Alli Murugesan (Post Doctoral Student)

Researchers involved in this project - Chercheurs participant au projet
Murugesan (Post Doc Student), Alli; Manzer , Dana; Webster, Duncan; Christie, Timothy.

Abstract - Résumé
OBJECTIVES This study evaluates whether benzodiazepine (BZD) use is problematic in a low-threshold/high-tolerance (LTHT) opioid-replacement program in Saint John, New Brunswick. BACKGROUND Benzodiazepine misuse is a potentially life-threatening issue which may be compounded by concurrent opioid use. Ongoing BZD misuse, among opiate-dependent patients receiving methadone maintenance therapy (MMT), has been associated with poor illicit drug abstinence and psycho-social rehabilitation in addition to increased morbidity and mortality thereby presenting a major challenge to MMT providers. The LTHT MMT program reviewed in this study has a low threshold for entry into the program and high-tolerance of non-compliant behaviors, focusing on a medical model of treatment with availability of primary health care. An earlier evaluation revealed the clinic had a 95% one-year retention rate, with 67% abstinence from illicit opioids. METHOD In a retrospective cohort of 84 participants, we evaluated the prevalence of BZD use among participants based on urine results from August 2009 - January 2010. We examined characteristics of the BZD and non-BZD users by comparing demographic information and illicit drug-use profiles. In addition, we assessed the use of SSRIs and antipsychotics prescribed for the management of co-morbid mental health disorders that may contribute to BZD misuse. RESULTS & CONCLUSION It was found that 36.9% of participants used BZDs at some point during the study. Among BZD users 54.8% were prescribed SSRIs or antipsychotics as compared to only 28.3% of non-BZD users. No mortality was observed. BZD use is common among this cohort and requires close attention given associated poor outcomes.

Objectifs: Cette recherche évalue si la consommation des benzodiazépines est problématique dans un programme de seuil bas et de grand tolérance de remplacement d’opioïde à Saint John, Nouveau Brunswick. Contexte: Mauvaise consommation des benzodiazépines est un problème potentiellement mortel qui peut être aggravée par la consommation d’opioïdes concurrente. Abus de benzodiazépine en cours, chez les patients dépendants aux opiacés recevant un traitement d’entretien à la méthadone, a été associée avec une mauvaise abstinence de drogues illicites et la réhabilitation psycho-sociale en plus d’une hausse de la morbidité et de la mortalité présentant de ce fait un défi majeur aux fournisseurs de traitement d'entretien à la méthadone. Le traitement d’entretien à la méthadone à seuil bas et de grande tolérance ont examinées, dans cette étude a un seul bas pour entrer dans le programme et une grande tolérance des comportements non conformes en se concentrant sur un modèle de traitement médical avec la disponibilité des soins de santé primaires. Une évaluation antérieure a révélé que la clinique avait un taux de rétention d’un an de 95%, avec 67% abstinence des opiacés illicite. Méthode: Dans une cohorte rétrospective de 84 participants nous avons évalué la prévalence de la consommation de benzodiazépines chez les participants en fonction des résultats de l’urine depuis Août 2009 - Janvier 2010. Nous avons examiné les caractéristiques des utilisateurs de benzodiazépines et non utilisateurs de benzodiazépine en comparant les données démographiques et les profils de consommation de drogues illicites. En outre, nous avons évalué l'utilisation des inhibiteurs sélectifs de la recapture de
la sérotonine et les antipsychotiques prescrits pour le traitement des troubles de santé mentale co-morbides qui peuvent contribuer à une mauvaise utilisation des benzodiazépines. Résultats et conclusion: Il a été constaté que 36,9% des participants ont utilisé des benzodiazépines à un certain moment au cours de l'étude. Parmi les utilisateurs des benzodiazépines 54,8% ont été prescrits les inhibiteurs sélectifs de la recapture de la sérotonine ou des antipsychotiques, comparativement à seulement 28,3% des non utilisateurs des benzodiazépines. Aucune mortalité n'a été observée. L'utilisation des benzodiazépines est fréquente chez cette cohorte et nécessite une attention particulière compte tenu des résultats médiocres associés.
Title of the research project - Titre du projet de recherche
The relationship between cold/freeze tolerance of Ixodes scapularis ticks, fat reserves and presence of the Borrelia bacteria

Poster presenter - Nom de la personne qui présentera l'affiche
Amal El Nabbout

Researchers involved in this project - Chercheurs participant au projet
El Nabbout, Amal; Lloyd, Vett; Rossolimo, Tatiana.

Abstract - Résumé
Background: Ticks are medically important as vectors of a number of serious pathogens, including the Borrelia burgdorferi sensu lato (s.l.) bacterium, which causes Lyme disease. Recent work on the spread of infected Ixodes ricinis ticks in Europe has suggested that Borrelia-infected ticks have higher fat deposits and are more cold hardy than uninfected ticks. Objective: To determine if there is a correlation between the cold/freeze tolerance of ticks, fat reserves and the presence/absence of Borrelia burgdorferi in Ixodes scapularis ticks from New Brunswick and Nova Scotia. Methods: Ixodes and Dermacentor ticks were collected by active environmental sampling and passive surveillance. The temperature preference of the live ticks was determined and a supercooling bath was used to determine the freeze point of the ticks. The fat reserve was calculated by subtracting the weight of the ticks before and after chloroform immersion. Their Borrelia infection status is being determined by nested PCR. Results: Ixodes scapularis can survive harsh environmental conditions and only die at -13 to -19 °C. Initial results showed that ticks with more fat can tolerate cold environments better than ticks with less fat. Initial results also showed that female ticks can tolerate harsh environments better than male ticks. Significance: This work suggests that there is an association between fat reserves as well as sex dimorphism and freeze tolerance of the Ixodes ticks, which may play a role in the spread of Lyme disease into Canada.
Title of the research project - Titre du projet de recherche
Intraoperative cell salvage is a safe method of decreasing perioperative blood transfusion rates

Poster presenter - Nom de la personne qui présentera l'affiche
Claudia Cote

Researchers involved in this project - Chercheurs participant au projet
Cote, Claudia; MacLeod, Jeffrey; Yip, Alexandra; O'Reilly, Bill; Pelletier, Marc; Hassan, Ansar.

Abstract – Résumé

Objectives: Intraoperative cell salvage (ICS) is a commonly used blood conservation strategy. However, to date, the evidence regarding its safety and efficacy has been conflicting. Our objective was to evaluate the impact of routine ICS on rates of perioperative blood product transfusion on patients undergoing cardiac surgery. Methods: Patients who underwent non-emergent cardiac surgery 18 months prior to and following the implementation of ICS were identified. Comparisons between patients who received ICS and those who did not were carried out on the basis of baseline clinical characteristics, perioperative transfusion rates, pre- and postoperative hematocrit levels, 12-hour mediastinal drainage volumes and rates of in-hospital postoperative adverse outcomes. Results: A total of 399 patients formed the final study population (ICS: n=196; control: n=203). ICS patients experienced lower rates of perioperative transfusion of any blood product (40.3% vs. 52.7%, p = 0.01) or of coagulation products specifically (FFP, PLT, CRYO, FEIBA) (19.4% vs. 32.5%, p = 0.003) but not of pRBC (36.2% vs. 45.3%, p = 0.06). Furthermore, patients receiving ICS had an increased postoperative hematocrit (30.4% ± 3.5% vs. 28.3% ± 4.5%, p <0.0001) and experienced decreased mediastinal chest tube drainage at 12 hours (320mL [230mL, 560mL] vs. 400mL [260mL, 690mL], p = 0.02). No significant differences were noted between the two groups in rates of in-hospital morbidity or mortality (Table 1). Conclusions: The use of routine ICS in cardiac surgery is an effective way of reducing perioperative rates of blood product transfusion with no associated increase in postoperative bleeding or other complications.
Title of the research project - Titre du projet de recherche
Incorporation and metabolism of polyunsaturated fatty acids in human T cells

Poster presenter - Nom de la personne qui présentera l'affiche
Jean Eric Munganyiki

Researchers involved in this project - Chercheurs participant au projet
Munganyiki, Jean Eric; Robichaud, Philippe-Pierre; Surette, Marc.

Abstract – Résumé

Polyunsaturated fatty acids (PUFA) are major constituents of cellular membrane glycerophospholipids. However, changes in capacities to incorporate and metabolize PUFA when cells enter the cell cycle have not been thoroughly studied, nor has the expression of genes potentially associated with these phenomena. In this study, we measured the incorporation and metabolism of exogenous PUFA in resting and proliferating (TCR/Il-2-stimulated) primary human T cells. Overall, proliferating T cells incorporated 10- to 20-fold more exogenous PUFA from the n-3 and n-6 families than resting cells, depending on the PUFA utilized, as measured by gas-chromatography. This was accompanied in proliferating cells by significantly increased (p≤0.05) expression of several acyl-CoA synthetases measured by qPCR (ACSL3, 3.5±0.4 fold; ACSL4, 4.4±0.5 fold; ACSL5, 2.1±0.4 fold; ACSL6, 13.1±3.9 fold), and in ACSL enzymatic activity compared to resting T cells (280±28 and 75±20 pmol/mg/min, respectively). Proliferating cells also showed a significantly greater capacity to elongate and desaturate the different n-3 and n-6 PUFA substrates than resting cells. Consistent with these activities, significant increases in expression of fatty acid desaturase (FADS)-1 (16.4±1.7 fold) and FADS2 (10.3±0.6 fold), as well as in elongases of very long chain fatty acid (ELOVL)-4 (1.4±0.1 fold) and ELOVL5 (1.6±0.2 fold) were measured by qPCR in proliferating T cells compared to resting cells. In conclusion, induction of T cell proliferation is associated with significant increases in the capacity to take up and metabolize exogenous PUFA. These metabolic capacities may be required for optimal induction of cell proliferation and may represent therapeutic targets for proliferative diseases.
Title of the research project - Titre du projet de recherche
Exploring the potential of nanoparticles to advance current interventions in cardiac medicine

Poster presenter - Nom de la personne qui présentera l'affiche
Shona Philip

Researchers involved in this project - Chercheurs participant au projet
Chan, Andrew; Brunt, Keith.

Abstract - Résumé
Objective: Current interventions for atherosclerosis such as percutaneous coronary intervention are not curative. Innovative therapies are urgently required. Advances in nanoparticle technology – nanocardiology - have demonstrated promise in advancing current cardiac therapies. Nanoparticles are ultra-small agents that have the potential to restore a dysfunctional endothelium at a molecular level. Heme oxygenase-1 (HO-1) is an antioxidative, antiinflammatory, and cytoprotective enzyme that has the potential to protect the endothelium and nanoparticles have the ability to encapsulate HO-1 inducers like curcumin which can allow the healing of the endothelium. Materials and Methods: In this research study, a high-density-lipoprotein (HDL) nanoparticle containing curcumin which induces HO-1 was tested in human umbilical vein endothelial cells (HUVECS) for its potential to protect the endothelium. Results: It was evidenced that this HDL mimicking nanoparticle containing curcumin attached to SR-B1 receptors in HUVECS. Toxicity resazurin assay showed that there was significant uptake with no effect on endothelial cell proliferation or toxicity through the resazurin assay. However, it was determined that there was florescent spectral overlap between curcumin and resazurin. The absorbance analysis did not show any interference with curcumin loaded samples. Conclusion: The findings of this research study show the potential of HO-1 inducers to protect the endothelium via nanoparticles. Nanoparticles can advance current therapies such as percutaneous coronary interventions to protect the endothelium on a molecular level. Further in vitro and in vivo research is necessary to explore the potential of nanoparticles in cardiology.
Increased distance from the tertiary care center to the patient’s home is associated with worse 30-day rates of adverse events following cardiac surgery

Poster presenter - Nom de la personne qui présentera l'affiche
Jeffery B. MacLeod

Researchers involved in this project - Chercheurs participant au projet
Hassan, Ansar; Yip, Alexandra M; Murray, Joshua; MacLeod Jeffrey B.; Lutchmedial Sohrab; Pelletier, Marc P.

Abstract - Résumé
Objectives: To determine the effect that a patient’s geographic place of residence had on 30-day outcomes following cardiac surgery. Methods: All patients undergoing non-emergent cardiac surgery at the New Brunswick Heart Centre (NBHC) between April 2004 and March 2011 were identified. Their geographic place of residence was defined as the driving distance from their home to the NBHC. Distance was divided into the following categories: 0-50km, 50-100km, 100-150km, 150-200km, 200-250km and >250km. Comparisons between distance categories were made on the basis of baseline characteristics, intra-operative variables and rates of post-operative in-hospital and 30-day adverse events. Multivariable logistic regression was used to determine the independent impact of increased distance on post-operative outcomes. Results: 4493 patients formed the final study population. 3897 (86.7%) had 30-day follow-up. Rates of in-hospital and 30-day adverse events differed across distance categories. After adjusting for differences in baseline characteristics, no independent effect of distance on adverse in-hospital outcomes was noted. However, increased distance from the NBHC was associated with increased risk of adverse events at 30 days [0-50km: 1.00 (referent); 50-100km: OR 1.16 (95% CI 0.83-1.62); 100-150km: 1.32 (1.05-1.65), 150-200km, 1.68 (1.33-2.11), 200-250km, 1.41 (1.06-1.88), and >250 km, 1.31 (1.04-1.64). Conclusions: Increased distance from the patient’s home to the NBHC was associated with worse 30-day outcomes following cardiac surgery. Further study is required to better understand why patients living further are more likely to experience surgical complications and/or readmission to hospital during this time period.
Abstract - Résumé
Background: Cisplatin is a small molecule (only eleven atoms) that has made a big impact in medicinal chemistry. Indeed, this simple coordination complex has achieved remarkable success in the treatment of ovarian, testicular, head and neck, bladder, cervical and small cell lung cancer.1 Unfortunately, cisplatin suffers from several serious side effects, such as oto-, neuro-, and nephrotoxicity, and therefore decreases its overall effectiveness in cancer therapy. Objectives: In order to bring cancer therapy to the next level, however, a radically different approach to designing platinum complexes is required. In this study we report the synthesis of a novel family of iminophosphines containing biologically-active boron groups and their corresponding platinum complexes. Methodology: Iminophosphines (NP) will be prepared by condensation reactions of primary amines containing boronate ester functionalities to 2-pyridinecarboxaldehydes. Once isolated, these ligands will be added to [PtCl2(coe)]2 (coe = cis-cyclooctene) to prepare the corresponding (NP)PtCl2 complexes. These novel platinum derivatives will be initially tested for their potential activity against M. tuberculosis using established methodologies. Upon completion of this study, these complexes will be examined for the anticancer properties against a number of cell lines in the labs of Drs. Morin, Turcotte, and Robichaud. Results: The initial family of platinum complexes we examined were prepared but not stable to air and water and thus negated biological testing. As such we have generated another family of complexes (four new complexes) that are stable and these complexes have been fully characterized using multinuclear NMR spectroscopy, FT-IR spectroscopy, melting point and elemental analyses. Once the final fifth compound is prepared we will initiate biotesting. 1.Gómez-Riuz, S.; Maksimonić-Ivanić, D.; Mijatović, S.; Kaluđerović, G. N. On the discovery, biological effects, and use of cisplatin and metalloccenes in anticancer chemotherapy. Bioinorg. Chem. Appl. 2012, 2012, 1-14.
Title of the research project - Titre du projet de recherche
Boron and Platinum: A Novel Approach for the Treatment of Breast Cancer

Poster presenter - Nom de la personne qui présentera l'affiche
Jessica J. Miller

Researchers involved in this project - Chercheurs participant au projet
Vogels, Christopher; Decken, Andreas.

Abstract - Résumé
Background: Cisplatin is a small molecule that has made a big impact in medicinal chemistry. Indeed, this simple coordination complex has achieved remarkable success in the treatment of ovarian, testicular, head and neck, bladder, cervical and small cell lung cancer.1 Unfortunately, cisplatin and its analogues suffer from several serious side effects, such as oto-, neuro-, and nephrotoxicity, and therefore decreases its overall effectiveness in cancer therapy. Objectives: In this study we will prepare a number of novel platinum boron-containing derivatives of the aniline derivative where the boron group is hypothesize to increase anticancer activity and decrease side effects.
Methodology: Iminopyridines (NN) will be prepared by condensation reactions of primary amines containing boronate ester functionalities to 2-pyridinecarboxaldehyde. Once isolated, these ligands will be added to [PtCl2(coe)]2 (coe = cis-cyclooctene) to prepare the corresponding (NN)PtCl2 complexes. These novel platinum derivatives will be examined for the anticancer properties against a number of cell lines using established techniques in the labs of Drs. Morin, Turcotte, and Robichaud.
Results: We have generated a family of iminopyridine platinum complexes (five new complexes) that are stable in air and water and these complexes have been fully characterized using multinuclear NMR spectroscopy, FT-IR spectroscopy, melting point and elemental analyses. Once the final sixth compound is prepared, this one should have the greatest solubility in water, we will initiate biotesting. 1.Gómez-Riu, S.; Maksimonić-Ivanić, D.; Mijatović, S.; Kaluderović, G. N. On the discovery, biological effects, and use of cisplatin and metalloccenes in anticancer chemotherapy. Bioinorg. Chem. Appl. 2012, 2012, 1-14.
Can Simple Boron Compounds Have Anticancer Activities?

Carmanah D. Hunter

Researchers involved in this project - Chercheurs participant au projet
Geier, Stephen; Robichaud*, Gilles; Turcotte*, Sandra; Westcott*, Stephen.

Abstract - Résumé

Background: Recent interest in boron-containing compounds arises from their latent biological activities. For instance, alpha aminoboronic acids are well-known for their ability to act as serine protease inhibitors and Bortezomib (aka PS-341 and Velcade□) has been shown to selectively and reversibly inhibit 26S proteasome. This remarkable boronic acid dipeptide was developed specifically for the treatment of human tumors and it inhibited proliferation at a mean IC50 value of 7 nM in 60 cell lines. Additional boron compounds may also display anticancer properties but have not yet been tested. Objectives: We have generated a vast library of bioactive boron compounds that have significant antifungal and antibacterial properties. In this study we will prepare additional analogues and examine their anticancer properties:

Methodologies: Boron compounds will be prepared using established methodologies already developed in our laboratory. Use of fluorinated started materials will also be examined and reactions will proceed by simple condensation pathways using standard chemical synthetic techniques. In this study we have investigated the potential anticancer activities of select members of these boron families in breast cancer cell lines and renal cell carcinoma (RCC).

Results: New boron compounds have been fully characterized using multinuclear NMR spectroscopy, FT-IR spectroscopy, melting point and elemental analyses. Our results show that some boron compounds inhibits proliferation of breast cancer cells, whereas only one family of boron compound was cytotoxic in RCC. These initial findings indicate potential for these new families of boron compounds to inhibit cancer cell proliferation that may be selective for different cancer type.
Title of the research project - Titre du projet de recherche
Minimally invasive spinal surgery versus open approach for the fixation of unstable traumatic fractures of the thoracolumbar spine.

Poster presenter - Nom de la personne qui présentera l'affiche
Edward Percy

Researchers involved in this project - Chercheurs participant au projet
Abraham, MD, Edward; Percy, Edward; Green, Alana; Elliott, Renee; Manson, MD, Neil.

Abstract - Résumé
Introduction: Over the past decade, the use of minimally invasive spinal surgery (MISS) in the treatment of traumatic fractures of the thoracolumbar spine has become increasingly popular. While MISS is associated with minimal blood loss and neuromuscular morbidity, there is little research directly comparing MISS to the traditional open surgical approach. The goal of this study is to compare outcomes in patients with unstable, traumatic fractures of the thoracolumbar spine treated with MISS versus open surgery.

Methods: A retrospective review of a prospective database was performed to obtain data from patients who underwent MISS or open spinal surgery for the fixation of unstable, traumatic fractures of the thoracolumbar spine between January 2007 and August 2011. T-test was used to assess intraoperative blood loss, OR time, and length of hospital stay.

Results: Twenty patients (mean age 40 (19-54)) who underwent MISS and twenty-two who underwent open surgery (mean age 35 (16-85)) were included. The open surgical group had significantly higher intraoperative blood loss per vertebral level (M = 300 cc/level, SD = 32 cc/level) than the group treated with MISS (M = 52 cc/level, SD = 37 cc/level), t(39) = 5.094, p = 0.000. Significant Levene’s tests precluded us from drawing conclusions about differences OR time and length of hospital stay.

Conclusion: Intraoperative blood loss for patients in the MISS group was significantly less than in the open group. Further research will focus on obtaining greater power and studying clinical outcomes such as Visual Analogue Scale and Patient Satisfaction scores.