OGIRC AUTUMN RETREAT 2011

November 27 & 28, 2011

Windermere Manor
North Meeting Room
London, Ontario

Sunday, 27 November

12.30	Registration
1.00	Welcome
1.15 - 3.05	Progress Reports and Discussion • Pre-Clinical – Cardiovascular & Immunomodulation
3.05	Break
3.15 - 4.30	Progress Reports and Discussion • Pre-Clinical – Metabolic
4.30 – 5.30	Progress Reports and Discussion • Plant Biotechnology & Agriculture
5.30	Reception and Poster Session I

Monday, 28 November

9.00	Registration and Housekeeping
9.15 - 10.30	Progress Reports and Discussion • Phytochemistry • Safety
10.30	Break
10.45 - 11.45	Progress Reports and Discussion • Advanced Processing
11.45 - 12.15	Annual General Meeting
12.15 - 1.00	Lunch
1.00	Presentations and Discussion • Private Sector Partners
1.45	Poster Session II
2.30	Poster Sessions I & II – informal discussion facilitated by Dr Marica Bakovic
3.30	Close
5.30	Management Committee Meeting Room M 105, Medical Sciences Building

Sunday, 27 November

Pre-Clinical - Cardiovascular

1.00	**Welcome, Coffee**		
1.15	John Ciriello		
1.30	Qingping Feng		
1.45	Morris Karmazyn / Melissa Moey	Ginseng as an Effective and Potent Cardiac Antihypertrophic Agent for the Prevention and Reversal of Heart Failure	
2.10	Kem Rogers		
2.25	Ed Lui	Vascular protective and immunomodulating effect of ginseng	Pharmacometabolomcis study showing the antioxidative and anti-inflammatory effect of ginseng against homocysteine-induced vascular injury. The yin and yang action on immune function and the basis of immune-suppression and anti-inflammatory effect.
2.40	Holly Lemmon presenting for Dr Joaquin Madrenas	Immunomodulation	
2.50	**Discussion**		
3.05	**Break**		

Pre-Clinical - Metabolic

3.15	Marica Bakovic	Ginseng prevents development of hepatosteatosis and insulin resistance in obesity prone Pcyt2 deficient mice	
3.30	David Mutch	Unraveling the adipocyte inflammomodulatory pathways activated by North American ginseng	North American ginseng is known to regulate immune function, inflammatory processes, and response to stress and fatigue. Different extracts of North American ginseng have distinct effects on the regulation of adipocyte gene expression. Pathway analysis indicated that the AQ extract, and in particular polysaccharides isolated from the Aq extract, triggered a global inflammomodulatory response in adipocytes. Toll-Like receptor 4 activation is implicated in this response. The EtOH and ginsenoside extracts had little to no effect on adipocyte gene expression.
3.45	Mehrbod Estaki, presenting for Dr Earl Noble	An overview of exercise and ginseng activity	
4.00	John Trevithick		

Pre-Clinical - Reproductive

Erectile dysfunction: see poster

4.15	**Discussion**		

Plant Biotechnology & Agriculture

4.30	Dan Brown	Agriculture and biotechnology progress toward cultivar development 2011	• Clonal line selection • Transcriptomics of root development
5.00	Mukund Shukla	An integrated system of micropropagation and conservation of American ginseng (Panax quinquefolius L)	An effective approach to accelerate plant production and conservation of North American Ginseng (NAG) (Panax quinquefolius L.) was evaluated by addition of melatonin which plays a vital role in plant morphogenesis and development.
5.15	**Discussion**		
5.30	**Reception & Poster I Session**		

Monday, 28 November

9.00	**Welcome, Housekeeping, Coffee**		
		Phytochemistry	
9.15	John Arnason	Total fractionation and preliminary charaterization of the water-soluble polysaccharides from Ontario ginseng, (Panax quinquefolius L)	In order to characterize Ontario ginseng polysaccharides at the molecular level, a fractionation approach using DEAE cellulose has been undertaken. Starting with 20g of purified polysaccharide, neutral (15g) and acid fractions (0.6) were separated. The acidic fraction was further separated by column chromatography on DEAE cellulose with a step gradient of saline solutions to yield 120 fractions. Phytochemcial characterization of the fractions after hydrolysis is being ungertaken useing a validated HPLC ELSD method for monosacharides. Quantitation of the reducing sugar content in the neutral polysaccharide fractions (DWSPE-N) is achieved by the phenol-sulfuric acid method. Quantitation of and the uronic acid content in the acidic fractions (DWSPE-A) by the m-hydroxydiphenyl method. Next steps involve. Charaterization of the un-hydrolyzed fractions using NMR (nuclear magnetic resonance spectroscopy), MALDI-TOF (Matrix-assisted laser desorption/ionization mass spectrometry), chemical or enzymatic degradation. The characterized fractions will be available for biotesting in immunomudulatory and other assays.
9.30	Paul Charpentier, Ed Lui	Polysaccharide analysis. Application of LC-MS/MS in product quality evaluation and pharmacokinetics of ginseng	GPC analysis. Farm to farm variability in ginsenosides; Influence of geographical location on chemical markers. Plasma and intestinal level of ginsenosides and metabolites after chronic treatment.
		Safety	
9.50	David Bailey	Inhibitory Effects of Ginseng on CYP3A-Mediated Drug Metabolism	CYP3A4 is crucial cytochrome P450 enzyme involved in the oxidative metabolism of 50% of all drugs. Thus, a potent inhibitor of CYP3A4 has the likelihood of markedly boosting the systemic level of numerous drugs with resultant toxicities related to overdose in humans. Our objective was to determine the inhibitory effects of ginseng aqueous and alcoholic extracts from participating OGIRC farms over 3 consecutive harvests and ginseng alcoholic extracts of 25 commercial products from 7 different manufacturers.
10.05	Ed Lui	Pesticide contamination	Report on soil and root levels
	Valter Feyles and Andrew Watson	Reproductive function	See poster presentation: D. Belanger
10.15	**Discussion**		
10.30	**Break**		
		Advanced Processing	
10.45	Jesse Zhu		
11.00	Paul Charpentier		
11.15	Ed Lui	Ginseng-based yogurt.	Issues with incorporating NHPs into food format.
11.30	**Discussion**		
11.45	**Annual General Meeting**		
12.15	**Lunch**		

Private Sector Partners

1.00	Megan Thomas, Jamieson Laboratories	Opportunities for Evidence-Based Natural Health Products in the Canadian Marketplace	There is significant research being done within the world of Natural Health Products but with what end goal? Through a brief review of our Canadian regulatory framework and relevant case studies, this presentation will review where the opportunity for innovative research sits based on industry and consumer demand and given our regulatory requirements.
1.15	Marvin Karges, OGGA	Introduction to Ontario Ginseng Growers – world's largest exporters of quality North American Ginseng	Ginseng is a very unique horticultural crop for Ontario due to its medicinal applications. Ontario ginseng's significant agricultural economic impact is offset by challenges in production, market authenticity and promotion across cultural lines. This presentation provides an overview of Ontario Ginseng and the current focus of growers and their association.

1.30 **Discussion**

1.45 **Poster II Session**

2.30 **Informal Q&A Session: Posters I & II**
Facilitator: Dr Marica Bakovic

3.30 **Close**

Poster I Session
Sunday, 27 November

Akhter, Kazi Poster # 9	Nanosizing of ginseng by microfuidic device for the controlled drug delivery	North American ginseng (*Panax quinquefolius)* is a widely used medicinal plant, with Canada being the largest grower (more than 60% of worldwide production). Nanoparticles attributed improved physico-chemical properties compared to the microparticles including relatively smaller size, higher ratio of surface area to volume, improved bioavailability and biodistribution, more targeted drug delivery, feasibility of various routes of administration (e.g. oral or inhalation). Compared to a batch process, a microfluidic system offers a controllable way to prepare monodispersed nanoparticles in a continuous fashion. Controlled drug delivery systems offer numerous advantages over the conventional dosage forms including improved efficacy, reduced toxicity, and improved patient compliance and convenience.
Estaki, Mehrbod Poster # 1	Use of North American Ginseng as a protective agent against exercise-induced muscular damage	One bout of eccentric exercise is known to cause significant damage and inflammation of myofibrils. North American Ginseng (NAG) possesses anti-inflammatory and anti-oxidant properties. NAG has been shown to reduce circulatory creatine kinase (CK) levels (marker of myofibrillar damage) after one bout of eccentric exercise.
Jiang, Mao Poster # 2	American ginseng acutely regulates contractile function of rat heart	In our study, we examined effects of acute American ginseng administration on rat cardiac contractile functions by using Electrocardiogram (ECG), Non-invasive blood pressure measurement and Langendorff isolated-perfused heart measurements. Significantly decreased heart rate and developed force were observed following ginseng treatments. In this study, we presented the first evidence of depressed cardiac contractile function by acute administration of North American ginseng in rat.
Lemmon, Holly Poster # 6	Ginsenosides Antagonize the Immune Modulatory Effects of North American Ginseng Extracts.	
Migchels, Megan Poster # 3	Chronic North American Ginseng treatment following diet induced obesity alters the expression of Fos-related proteins in medullary cardiovascular areas	Ginseng has been used for centuries as a medicinal herb. Obesity-induced hypertension is associated with an increase in sympathetic nervous activity. In addition, there are data to indicate a reduced baroreceptor reflex function, that ultimately leads to increased arterial pressure and sympathetic nerve activity. The possible effects of North American Ginseng (NAG) on neuronal pathways involved in cardiovascular regulation are not known. The active ingredients in NAG are ginsenosides . Ginseng is consumed primarily as alcohol or aqueous root extract . NAG contains greater levels of ginsenoside Rb1, a phytoestrogen which has been shown to induce a hypotensive effect. Ginsenoside Rb1 has also been shown to provide a partial neurotrophic and neuroprotective effect on catecholaminergic neurons. Catecholamine cell groups in the brainstem are important in cardiovascular control. Our hypothesis is chronic ginseng treatment reduces the risk of developing hypertension and becoming overweight by altering the activity of brainstem catecholaminergic neuronal systems.

Moazzen, Hoda Poster # 5		
Sen, Subrhrojit Poster # 7	Preventive effects of North American Ginseng (*Panax quinquefolius*) on diabetes-induced retinopathy and cardiomyopathy	Ginseng(Araliaceae) has gained popularity in the west because of its various pharmacological properties. The aims of the present study are to evaluate the preventive effects of North American ginseng on diabetic retinopathy and cardiomyopathy and the underlying mechanisms of such effects.
Singh, Ratnesh Poster # 8		
Wilson, Sarah Poster # 10	Unraveling the adipocyte inflammomodulatory pathways activated by North American ginseng	
Zhao, Ganjian Poster # 4	Antihypertrophic effect of Ginseng and ETa receptor antagonist : mono- versus combination: mechanism of the inhibition of COX-2	Endothelin 1 (ET-1) levels are elevated in plasma of patients with heart failure and ET-1 has beein shown to induce cardiac hypertrophy. We examined the effect of ginseng on ET-1-induced cardiac hypertrophy and its interaction with the ETA receptor antagonist BQ123.

Poster II Session
Monday, 28 November

Alipour, Misagh Poster # 3	The Antibacterial Effects of Tobramycin and Ginseng Extracts in a *Pseudomonas aeruginosa* Animal Infection Model	This study examined the immunomodulatory and antimicrobial properties of the North American ginseng extract (*Panax quinquefolius*) alone or in combination with tobramycin in a *Pseudomonas aeruginosa* pulmonary infection animal model.
Azike, Chike Poster # 4	Paradoxical Immuno-modulatory Effect of North American Ginseng Aqueous Extract	The objective of this study is to examine the paradoxical immuno-modulatory effect of NA ginseng AQ extract. NO production in culture by pulmonary alveolar macrophages isolated from adult rats treated orally with 125mg/Kg AQ extract for 3 or 6 days, were used to evaluate to evaluate the influence of ginseng on immune function. Both treatments resulted in significant increase in NO production as compared to cells from non-treated control group. Moreover alveolar macrophages isolated from rats treated with ginseng for 6 days (but not 3 days) showed a reduction in NO response to LPS challenge in culture; this observed effect perhaps reflects an immuno-suppressive effect of orally administered ginseng. This ex vivo anti-inflammatory effect could be replicated in vitro study which showed similar desensitization of LPS response in murine Raw 264.7 macrophages by pretreatment with AQ or crude polysaccharide (PS) fraction for 24 hr prior to LPS challenge.
Belanger, Danyka Poster # 5	Effect of ginseng extracts on preimplantation embryonic culture	Ginseng consumption has increased substantially over the past decade, and with increased use in females, investigating ginseng's effects on preimplantation development is of utmost importance. North American Ginseng processed through either aqueous or alcoholic extraction was used, in which the major bioactive constituents are ginsenosides. The purpose of this study is to investigate the concentration response effect of either extract as well as individual ginsenosides Rb1, Rg1 and Rb1+Rg1. The in vivo effect of both ginseng extracts on preimplantation development was also evaluated. This study is the first to investigate the effects of ginseng extracts on preimplantation development. Our results suggest for women wishing to become pregnant to be cautious of ginseng consumption until more research can be done to establish safe consumption parameters.
Davie, Jessica Poster # 6	North American ginseng increases nitric oxide synthase in penile tissue of healthy male and pre-diabetic rats.	Ginseng has been used for years as a natural aphrodisiac. Animal studies have shown Chinese ginseng improves male sexual behaviour by: (1) decreasing mount and ejaculation latencies; and, (2) restoring mating behaviour in animals with copulatory disorders. Ginseng has also been shown to cause vasodilation in the corpus cavernosum. Few studies have demonstrated that North American (NA) ginseng can also improve sexual behaviour in male rats by decreasing mount, intromission and ejaculatory latencies. The main objective of this study was to evaluate the effects of NA ginseng on male sexual behaviour in rats and the expression of nitric oxide synthase, a cellular mediator of erectile function, in erectile tissue.
Ma, Ying / Manifar,Sima Poster # 7	Value added Ontario Ginseng Product	We tried to make new products with ginseng such as a chew tablet, ginseng powders with different sizes, ginseng extract products and thermal-sensitive gels.

Salarian, Mehrnaz Poster # 8	Synthesis and Charaterization of Poly(propylene fuamrate) Encapsulating Ginsenoside Rg1 for Treating Osteonecrosis	Healthy bone tissue depends on blood circulation to transport oxygen, nutrition, carbon dioxide, waste, and so forth. There are many risk factors, trauma for example, which can cause interruption of the blood supply to bone resulting in osteonecrosis. Cementation is a newly developed technique in treating osteonecrosis. For treating osteonecrotic lesion, angiogenesis is required to encourage the healing process and graft incorporation and stimulate osteogenesis. Ginsenoside Rg1 is showed to stimulate capillaries formation, proliferation, and migration of human umbilical vein endothelial cells (HUVECs) acting as an angiogenic agent. This study examines the angiogenic property of ginsenoside Rg1.
Samimihaghgozar, Raziye Poster # 9	Oral Drug Delivery System for North American Ginseng Extract	Panax Quinquefolius is a medicinal plant used in traditional herbal medicine grown in North America mainly for its roots. The main components of Ginseng are ginsenosides and polysaccharides which provide biological activities such as anti- and pro-inflammatory mediation effects. Considerable attention has been focused on the development of novel drug delivery systems such as microspheres and hydrogels as nutraceutical extract carriers for oral administration. We hypothesized that different carrier such as microsphere and microsphere/hydrogel combination systems could achieve a controlled release of nutraceutical agents in an oral delivery system.
Wu, Di Poster # 1	*De novo* assembly and analysis of the North American ginseng transcriptome by next generation sequencing	One of the major medical bioactive components of North American ginseng is the triterpene saponins known as ginsenosides. We have selected seven different development stages of North American Ginseng roots which were subjected to transcript profiling using the next-generation sequencing (NGS) technology by the Roche 454 platform. The transcriptome assembled and sequences analysed in this study create a comprehensive resource covering the key plant developmental stages from shoot emergence through flowering, seed production and senescence and will be a key to the understanding of the ginsenoside biosynthesis pathways as well as elucidating differences in genotypes with different ginsenoside patterns linked to biological efficacies. As well, the genomics data will lead to improvement of ginseng genetic profiles, genetic marker discovery and development of ginseng cultivar quality control.
Zhou, Sijun Poster # 2	North American Ginseng Constituent Analysis and Evaluation of Potential Efficacy for Therapeutic Applications	With the establishment of the Ontario Ginseng Innovation and Research Consortium in 2008 we have begun a systematic analysis of the quality of NA ginseng grown in Ontario and have started to examine the medicinal properties of a range of applications including its anti-oxidant activities, and immuno-stimulatory properties in both a variety of farm-sourced material and in clonally produced lines.

Monday, 28 November - Poster I & II – Informal Q & A and Discussion Facilitator: Dr Marica Bakovic			
Presentation Order			
1	Mehrbod Estaki	10	Jessica Davie
2	Mao Jiang	11	Misagh Alipour
3	Megan Migchels	12	Danyka Belanger
4	Ganjian Zhao	13	Sijun Zhou
5	Hoda Moazzen	14	Di Wu
6	Holly Lemmon	15	Ying Ma, Sima Manifar
7	Subhrojit Sen	16	Mehrnaz Salarian
8	Ratnesh Singh	17	Raziye Samimihaghgozar
9	Chike Azike		