UCFV
UNIVERSITY COLLEGE of the FRASER VALLEY

Undergraduate Research Excellence Awards

December 7, 2004

Welcome to the 2004 UCFV

Undergraduate Research Excellence Awards Presentation

Over $18,000 is being awarded tonight to students who were nominated by faculty based on exceptional research work, either as part of the work study program or as research assistants, or for an outstanding research project as part of a course.

Funds for tonight's awards have been provided by the UCFV and UCFV Foundation "Driven to Succeed" campaign.
Valley Autohouse and Envision Financial generously donated a 2004 VW New Beetle for a raffle which was held last September.
To "put the wheels in motion", StarFM, Xfm, the Abbotsford News, and the Chilliwack Progress all made considerable promotional donations.

Thank you to all our major sponsors.

All proceeds from the "Driven to Succeed" raffle have been committed to scholarships, bursaries and learning resource projects to benefit the students of UCFV.

Hosted by
UCFV Research & Industry Liaison

Program

Welcome:
Yvon Dandurand, Dean of Research & Industry Liaison

Opening Remarks:
Rob Nicklom, Chair, UCFV Board of Governors

Dinner Buffet

President's Remarks:
Dr. H.A. (Skip) Bassford

Remarks:
Dr. Wayne Welch, Vice President, Academic

Awards Presentations:

Dr. Wayne Welch, VP Academic

DJ Sandhu, Acting Dean,
Community Access, Business, & Information Technology

Tim Segger, VP Learning & Student Success

Dr. Virginia Cooke, Dean, Arts & Applied Arts

Dr. H.A. (Skip) Bassford, President

Rob Nicklom, Chair, UCFV Board of Governors

Marian Dyck, Chair, UCFV Foundation

Dr. Jackie Snodgrass, Dean, Science, Health, & Human Services

Thank you for joining us for this special recognition of student achievements!

Biology

Recipient: Michelle Thielmann

Faculty Supervisor: Anthony Stea
Program Head: Barbara Moon

Award: $500

Recognized for outstanding work on

Do Pyrethroid Insecticides Affect Human Gene Expression?

Pyrethroids are synthetic forms of the natural insecticide pyrethrum produced by chrysanthemums. Pyrethroids account for over 30% of world-wide insecticide market. There is controversy over the long-term effects of exposure to these chemicals. Pyrethroids disrupt signalling in the nervous system of insects and at high levels can do the same in humans. At low levels these insecticides do not cause any obvious short term effects on humans but several studies have shown that at these levels certain essential molecules in human nerve cells are affected. Because of this, my project has been focused on determining the effects of low-levels of pyrethroids on human cells, especially in regards to how they affect the expression of human genes.

Biology

Recipient: Joanne Neilson

Faculty Supervisor: Barbara Moon
Program Head: Barbara Moon

Award: $500

Recognized for outstanding work on

Differences in Socialization Behaviour of Male and Female Gazella dama mhorr Calves in Captivity

This project was inspired by the rare birth of both a male and female Mhorr gazelle calf within the same month at Mountain View Breeding and Conservation Centre in Fort Langley, British Columbia. Mhorr gazelles are extinct in the wild and only approximately 200 individuals exist in captivity worldwide. To date, there has been no academic research on how juveniles establish their place in the herd hierarchy. For this study, the calves from the captive herd were observed both directly and by videotape footage. Comparisons were made of the types of interactions exhibited by the male versus the female calf and how they interact with the herd. Preliminary results indicate that the calves spend significantly more time interacting with each other and their respective mothers than they do with other herd mates, and it appears that both sexes exhibit similar behaviour types at this sub-adult age. I hope that the results of this study will aid in captive management of this species to reduce aggression and improve survival, enabling a strong population to contribute to the reintroduction program to their native sub Saharan habitat in Western Africa.

Biology

Recipient: Christine Kwitkowski

Faculty Supervisor: Allan Arndt
Program Head: Barbara Moon

Award: $500

Recognized for outstanding work on

Mitochondrial DNA Analysis of Moose (Alces alces) from Central North America: Assessment of Regional Population Diversity and Development of Methods for Analysis of Ancient Antler.

The discovery of a 6,400 year-old moose (Alces alces) antler in Manitoba has inspired the development of methods to extract its DNA for analysis. After first identifying the best method for extraction of DNA from antler, a series of five overlapping primer sets were designed and optimized to maximize the chances of successfully amplifying mitochondrial DNA from this ancient material. Secondly, in order to compare results from this ancient antler, a genetic database of modern moose samples was required. DNA was therefore extracted and sequenced from 20 moose tissue samples. This modern database of Manitoba region moose DNA sequences, combined with sequences from Minnesota from another study (Hundertmark, 2002), provide a reasonable database to which the ancient sample can be compared. Genetic analysis of this database also demonstrated that gene flow, or migration, among moose is substantial across central North America. Successful application of these methods to the ancient moose antler sample will allow us to gain a glimpse into the genetic composition of the moose population that existed in central North America 6400 years ago.

Business Administration

Recipients: James Copeland
David McIntosh
Tim Doherty
Matthias Morel
Byron Drader
Brent Rice
Steven Hoffman

Faculty Supervisor: Lorne Mackenzie
Program Head: Lorne Mackenzie

Award: $250 each

Recognized for outstanding work on

Abbotsford - Las Vegas Feasibility Study: An Opportunity for America West Airlines

In the spring of 2004, our group completed a study assessing the feasibility of a scheduled air service between the Abbotsford International Airport, and the McCarran International Airport in Las Vegas. The research period lasted three months and used a variety of primary and secondary type data to determine demand and operational viability. Specifically the report focused on the following aspects:

- An analysis of the Abbotsford International Airport including capabilities and competitive advantages
- Market research and analysis
- Financial viability
- A customized marketing plan
- Operations plan
- Implementation timeline

Overall, this project allowed us to get some real-world experience as well as some insight into the business-side of the aviation industry. Furthermore, the study allowed us to utilize the skills that we have learned in the Business Administration in Aviation Degree, and apply them to a specific industry application. This helped develop our overall skill set and has given us confidence for future endeavours.

We would also like to recognize Ross Brown, Summer Dhillon, and Paula Catherwood and thank them for their significant contribution to the project.

Chemistry

Recipient: Manjinder Dhaliwal

Faculty Supervisor: Noham Weinberg
Program Head: Art Last

Award $750

Recognized for outstanding work on

How Quickly do Knotty Molecules Lose Their Energy as They Grow Up?

This study examined the stability of hydrocarbon molecular knots and size dependent trends in their properties by using computer simulations, including quantum mechanical and molecular mechanical calculations. A tubular model was formulated to describe molecular knots.

UCFV UNDERGRADUATE RESEARCH EXCELLENCE AWARD 2004

Chemistry

Recipient: Christine McLoughlin

Faculty Supervisor: Noham Weinberg
Program Head: Art Last

Award: $750

Recognized for outstanding work on

Conjugation in Azines

Conjugation is a delocalization of electrons between two neighbouring double bonds. It is expected to take place when two double bonds are separated by a single bond. However, azines, a class of organic molecules that possess this structure, do not show typical signs of conjugation. Due to this unusual behaviour, azines were labelled "conjugation stoppers" and are believed to be an exception. In the present study we show that, contrary to this belief, conjugation of double bonds in azines is quite strong, although its manifestations are smeared by the possibility of their conjugation to lone pairs of the bridging nitrogen atoms.

Criminology / Criminal Justice

Recipient: Annette Vogt

Faculty Supervisor: Aili Malm
Program Head: Darryl Plecas

Award: $750

Recognized for outstanding work on

The Evaluation of an RCMP Problem-Oriented Policing Project

Measuring the collective impact of various initiatives, including social development strategies aimed at mobilizing a community toward taking action against crime and disorder.

Safe Schools: Moving From Policy to Practice

This project was developed to contribute to the prevention of crime and the enhancement of community safety. Focused on the importance of school connectedness and belonging shaping perceptions and experiences relating to the safety of school, this project continues to provide on-going support to the pilot schools in a manner that will provide evaluative information for on-going collaborative work in schools and communities.

Annette has had an abstract accepted for presentation at the Western Society of Criminology Conference in Honolulu, Hawaii, February 2005.

Criminology / Criminal Justice

Recipient: Byron Hill

Faculty Supervisor: Aili Malm
Program Head: Darryl Plecas

Award: $750

Recognized for outstanding work on

Marijuana Grow Operation Study

This study looked at a number of variables surrounding grow operations in British Columbia. This longitudinal study examines seven years of data.

Spacial Analysis of Methamphetamine Labs in Surrey British Columbia

Methamphetamine consumption, distribution and production are quickly becoming major problems for urban centers across North America. The current study seeks to analyze these issues through a spatial examination of methamphetamine laboratories in Surrey British Columbia, Canada. The data were collected through a file review of all methamphetamine production files from the years 2001, 2002, and 2003. The spatial patterns are consistent with criminological literature in the area of illicit drug production. The analysis illustrates a predominant absence of methamphetamine labs in areas of high socioeconomic status and low mobility. Crime generators and attractors are also discussed in relation to methamphetamine production.

Byron has had an abstract accepted for presentation at the Western Society of Criminology Conference in Honolulu, Hawaii, February 2005.

English

Recipient: Natalie Hughes

Faculty Supervisor: Susan Fisher
Program Head: Jim Andersen

Award: $750

Recognized for outstanding work on

Research Notebook: Canadian Children's Literature before 1920

Canadian children's literature before 1920 depicted the adventurous life settlers faced in the Canadian wilderness. Common themes in works of this period include natives, religion, the fur trade, and nature. Authors such as William Henry Drummond created stories for children based on historical events. Madeleine Verchères by Drummond is based on a real event and a real place: Verchères is a village in Quebec and Madeleine is a heroine who fought against the Iroquois. Young readers during this period were given a somewhat romantic vision of Canada: as seen in children's books of the nineteenth century, it was a wild, hard country, full of savages, danger, and adventure.

English

Recipient: Kristi Collins

Faculty Supervisor: Susan Fisher
Program Head: Jim Andersen

Award: $750

Recognized for outstanding work on

A Research Notebook on Pauline Johnson

This project was an account of the search for primary sources by and about Pauline Johnson, including a description of materials in Special Collections at the Vancouver Public Library. It also contained a critical analysis of "The Song My Paddle Sings."

History

Recipient: Carol-Anne Whitelaw

Faculty Supervisor: Barbara Messamore
Program Head: Sylvie Murray

Award: $500

Recognized for outstanding work on

Social Institutions of Irish, Scottish, and Chinese Immigrants in Canada to 1915: The Formation of the Canadian Mosaic

This project was the final essay for a fourth-year history seminar course on Canada and Migration. Carol-Anne produced an ambitious project that far exceeded the requirements of the course. During the course of her research, she visited the BC Provincial Archives to view material relating to Chinese organizations active in British Columbia. The result was a very interesting synthesis in which she examines the factors that contributed to either the preservation of ethnic distinctiveness or eventual assimilation with respect to each of the three groups. Her research considers religion, recreation and sport activities, music, games and other varied manifestations of cultural distinctiveness.

History

Recipient: Dianne Knox

Faculty Supervisor: Barbara Messamore
Program Head: Sylvie Murray

Award: $500

Recognized for outstanding work on

The Doukhobor Problem

For the History 430 Canada and Migration course, Dianne prepared an essay on "The 'Doukhobor Problem'", which surveyed the arrival of the thousands of Doukhobors from Russia in Canada late in the nineteenth century, the difficulties of assimilation, the ultimate relocation of many to British Columbia, and the factors that led to clashes with the larger society and officials. Dianne has shown a recognition of the inherent complexity of many historical controversies. Rejecting simplistic conclusions that fix blame on a faceless establishment for the persecution of minorities, Dianne instead produced a balanced account, and used her source materials well to offer a more nuanced judgment.

History

Recipient: Kiri Eby

Faculty Supervisor: Jack Gaston
Program Head: Sylvie Murray

Award: $500

Recognized for outstanding work on

Article Index on the "Woman Question" in Victorian Periodical Literature (1837-1901)

Kiri Eby, working with Dr. Jack Gaston on his research project, is contributing to an online index of articles on the "Woman Question" in Victorian periodical literature (1837-1901). This project is in the exciting early stages, and ultimately aims to make broader use of the vast resources of nineteenth-century British periodicals related to gender studies. Periodicals were a great vehicle of public dialogue on many important topics of the Victorian era, and the emergence of a feminist movement coincided with and took advantage of this forum. Kiri's research has already led her through two feminist journals (the Women's Suffrage Journal and the English Woman's Journal), and she looks forward to tackling the mainstream The Nineteenth Century.

Kinesiology

Recipient: Brynne Elliott

Faculty Supervisors: Greg Anderson & Michael Gaetz
Program Head: Rebecca Frechette

Award: $750

Recognized for outstanding work on

EMG Activity of Trunk Stabilizers during Stable and Unstable Exercise

This experiment investigates the effects of stable versus unstable exercise conditions on the activation of the muscles of the trunk as measured by surface EMG. Fifteen highly trained participants performed five exercises (two foot bridge, one foot bridge, side bridge, curl up and superman), each performed in one stable condition using the floor and/or weight bench, and two unstable conditions using the platform or dome side of a BOSU ball, and/or a Stability Ball.

The results showed that significant differences between stable and unstable conditions were only evident for the side bridge. For every exercise except for the curl-up, there was a significance difference between the activation patterns of the three muscles. The curl up to forty-five degrees was the one dynamic exercise performed by the participants and was found to provide the greatest challenge to the muscles of the trunk.

Kinesiology

Recipient: Matt Holtzmann

Faculty Supervisor: Greg Anderson & Michael Gaetz
Program Head: Rebecca Frechette

Award: $750

Recognized for outstanding work on

EMG Activity of Trunk Stabilizers during Stable and Unstable Push-Ups

This experiment examined muscle activation measured using electromyography (EMG) during a standardized push-up performed on stable and unstable surfaces. Fifteen highly trained participants performed 6 variations of the push-up. A standardized push-up was compared to push-ups performed with either the hands or feet on an unstable surface, and two varieties of push-ups performed with both hands and feet on unstable surfaces. Unstable surfaces were created using a Stability Ball, BOSU Ball, and an Extreme Balance Board.

The results showed that push-ups performed with dual instability had significantly greater EMG activation compared to single instability or the stable push-up. In addition, as instability increased, there was a greater amount of muscle activation for the core stabilizers and prime movers. The findings are consistent with the position that the use of unstable surfaces in conjunction with standard exercises can be used to activate core trunk stabilizers. This in turn can provide increased trunk strength and greater resistance to injury.

Math / Statistics

Recipient: James Shiell

Faculty Supervisor: Gillian Mimmack
Program Head: Gillian Mimmack

Award: $1,500

Recognized for outstanding work on

Broiler Chicken Growth Rate Study

The growth rate study was conducted to determine the effectiveness of using a mathematical regression formula encapsulating past chicken flocks' gleaned data as a predictor of the current flock's growth rate. In other words, could one use a combination of historical records and knowledge of intended shipping age, feed company and baby chick placement density to accurately predict the next flock's total growth within a narrow margin of error? The aim was to give broiler farmers an accurate tool to determine the correct number of chicks to purchase to fall within the regulatory agency's total production limits.

Philosophy

Recipient: Layle Dykstra

Faculty Supervisor: Moira Gutteridge Kloster
Program Head: Glen Baier

Award: $1,500

Recognized for outstanding work on

Philosophical audit of a family's disputes

A philosophical audit checks dispute resolution procedures for respect, fairness, legitimate authority, and sound reasoning. This project extended the audit technique beyond well-defined workplace procedures, to examine ill-defined family dispute processes. The differences in conflict patterns between four siblings were explored to see what might explain recurring family conflicts between siblings in several generations. The values and world-views of each sibling were charted, using an innovative application of cross-cultural research. Charts revealed differences in belief systems that could accounted for the patterns of alliance and conflict between the siblings. The resulting recommendations offered ways to work with the belief systems to reduce conflict between the siblings

Physics

Recipient: Daniel Mori

Faculty Supervisor: Rob Woodside
Program Head: Peter Mulhern

Award: $1,500

Recognized for outstanding work on

Studies in Spacetime Curvature

The mathematics of Einstein's General Theory of Relativity requires mathematical objects called 'tensors.' Tensor calculations can take up to months of work by hand, but with the recent advent of tensor manipulation packages, previously impossible tensor calculations can be done by interested undergraduates.

Dan has had to learn the rudiments of General Relativity and with this knowledge, has made an attack on curvature tensors, which describe the curvature of spacetime. Riemann introduced these nearly 150 years ago and nearly 100 years ago, Einstein was able to explain gravity with them. The distance between two points in spacetime depends on nearby matter, according to Einstein's equations. A solution to Einstein's equations is the metric tensor, which determines such distances between points. The equations set pieces of the curvature tensor equal to a mechanical tensor involving energy density, pressure, etc. The curvature arises from second derivatives of the metric tensor and so Einstein's equations are second order, nonlinear partial differential equations in the metric tensor. Remarkably, the curvature tensor has algebraic symmetries and these can be used to find the metric tensor from the curvature tensor up to a multiplying function, without solving any differential equations!

Dan has used the tensor package GR II, which is an add-on to the mathematical engine Maple, to write a program that does this. Then he uses a further differential identity on the curvature to find the multiplying function from a single differential equation.

Social, Cultural, and Media Studies

Recipient: Jocylene Blanchette

Faculty Supervisor: Katherine Watson
Program Head: Elizabeth Dennis

Award: $1,500

Recognized for outstanding work on

"Bros Before Hos:" An Interpretive Study of Young Men's Attitudes toward Promiscuous Sexual Behaviours of Women and Men

According to much of the literature on masculine sexuality, negative labels inherent with sexual connotations can provide men with a reference point from which to negotiate this own behaviours in heterosexual relations. This exploratory research aimed to investigate how young men defined appropriate and inappropriate sexual behaviour. This definition is explored through three main questions: What is "appropriate" sexual behaviour?; How are individuals who engage in "inappropriate" sexual behaviour evaluated?; How do these behaviours affect their desirability as a potential partner?

Although the results cannot be generalized to the greater population of men, the results of this small group study clearly show that the "sexual double standard" had not diminished among this group and continued to play an important role in their negotiation of relationships.

Social Work & Human Services

Recipient: Diana Charleston

Faculty Supervisor: Georgina Marsom
Program Head: Gloria Wolfson

Award: $500

Recognized for outstanding work on

Stopping the Violence: Understanding the Role of Feminist Group Work in Helping Women Counter Relational Violence

Diana worked as research assistant for instructor Georgina Marsom. Through participatory action research, this evaluative study goes beyond determining the efficacy of group work alone by involving group members in the research itself. Women who have attended groups offered by the Women's Resource Society of the Fraser Valley participated in a focus group this past spring, to share their experiences and stories about relational abuse and how feminist group work has helped them in countering violence from their partners. These participants will continue to work with the researchers to identify the variables that have helped them make positive changes for themselves and their children. One of the findings to date shows a gap in research from 1993 to the present and we therefore expect to contribute to the knowledge base in this area of study.

Social Work & Human Services

Recipient: James Yard

Faculty Supervisor: Gloria Wolfson
Program Head: Gloria Wolfson

Award: $500

Recognized for outstanding work on

Upper Fraser Valley Homelessness

James worked as research assistant for the Upper Fraser Valley Homelessness project, a joint project of MCC BC Employment and Community Development, the UCFV School of Social Work and Human Services, United Way of the Fraser Valley, and Community Services agencies in Mission, Abbotsford, Chilliwack, Hope, and Boston Bar, and was funded by HRDC.

James' duties and responsibilities included:

- Assisting with the coordination of Advisory Committee meetings.
- Assisting with the coordination of focus groups and volunteer training.
- Assisting with generating a list of service providers through a series of telephone interviews.
- Creating maps used in the Snapshot Survey for the communities involved in the study.
- Developing tracking sheets based on map demarcation in each community for volunteers involved in street sweeps that included time, location and number of people at the location. These tracking sheets provide information for future homelessness research projects.

James had the opportunity to gain practical experience in scientific social research. Specifically, he was involved primarily in the process leading up to the Snapshot Survey.

Social Work & Human Services

Recipient: Jeremy Harder

Faculty Supervisor: Robert Harding
Program Head: Gloria Wolfson

Award: $500

Recognized for outstanding work on

Framing Aboriginal Child Welfare Issues in British Columbia

Jeremy worked as research assistant to Robert Harding on this project. Methods of content analysis were applied to 291 newspaper articles about Aboriginal child welfare issues in British Columbia in five separate years: 1993, 1998, 2001, 2002 and 2003. In addition to analyzing coverage of these issues in major "dailies" such as the Victoria Times-Colonist and The Vancouver Sun, this study cast new light on news framing techniques employed by community newspapers such as The Chilliwack Progress and The Abbotsford Times. One of the findings of this research is that, when it comes to reporting Aboriginal child welfare issues, the media frequently utilize a limited, and often limiting, range of frames and scripts. This project was supported by a SSHRC Aid to Small Universities grant.