

# Strategic Plan for HHNS

## 2010-04-27

### Introduction

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The current University strategic plan is committed ‘to integrate the learning and research experience’ and has a “special commitment to interdisciplinary programs”. There are seven institutional strategic research themes (environments, advanced analysis, culture and society, communities and families, biotechnology, food, and health and well-being) and these are “complementary, each impacting the health and well-being of Canadians as well as the economy”.

The Department of Human Health and Nutritional Sciences (HHNS) reflects many of these themes and shares the mission of the University. Health (good or bad) is an excellent example of biodiversity as it is determined by an interaction of genetic predisposition and environmental factors. It could also be stated that it is the integration of the structure (form) and its function. Lifestyle, a major component of our environment, has a very strong influence on our health. Public health is clearly in transition and chronic diseases, often caused or aggravated by lifestyle are key issues. Lifestyle has been shown to be vital to preventing and for treating these conditions. Lifestyle encompasses many factors, and the focus of HHNS is on physical activity and diet as powerful determinants of human health. For example, it is estimated that 60-70% of cancers can be prevented through changes in diet, and physical activity decreases the incidence of cardiovascular diseases, colon and breast cancer, type 2 diabetes and improve physical mobility and function. Diet and physical activity have been shown to be more effective at delaying the onset and moderating type 2 diabetes than drug interventions. Similarly, biomechanics integrates form and function in examinations of factors that are central to such health issues as pain, falls and mobility hip fractures in the elderly, and diseases related to sensory-motor and neuromusculoskeletal function. There is particular interest is healthy aging and addressing sensory loss and its implications. We also recognize that understanding normal function in healthy humans, or animal models, is a critical starting point in defining human health. The Department integrates the knowledge base of the University, and especially that of the Biological Sciences, in addressing the Biology of Human Health. Both in its research and teaching, the Department examines how genetics and environment (particularly in terms of lifestyle) influence the health of humans.

HHNS recognizes the strength of interdisciplinary interactions. The Department offers a strong, basic background in the fundamentals of nutrition, anatomy and physiology and uses the expertise of the faculty to offer further courses in a range of topics that are fundamental to the biology of human health (for example: biomechanics, neurophysiology, metabolism, nutrition, growth and development, nutrition and disease, immune function, exercise, functional foods and nutraceuticals, toxicology). The Department has broken down traditional barriers and expanded our expertise to range from molecular biological approaches to studies of intact humans in an effort to understand the breadth of human health. Similarly, we have broken down barriers by sharing academic programs with other Colleges. This approach strengthens both teaching and research activities. Students are exposed to a wide variety of human health research techniques, and faculty has access to many other experimental approaches through collaboration. This allows research programs to be more interdisciplinary and to address research questions at many levels of study.

HHNS has shown creativity and imagination through the development of the Health and Performance Centre (HPC) and the Human Nutraceutical Research Unit (HNRU) in order to enhance our opportunities in education, research and community engagement. The HPC supports the HHNS’ academic focus on human health by providing creative and innovative rehabilitation, services and programs to improve one’s nutrition and physical activity lifestyle, as well as educational and research opportunities. HHNS created the HPC and spearheaded the collaborative initiative between academic (HHNS) and non-academic partners (Student health services and the Department of Athletics) to enhance the recognition of the importance of physical lifestyle in one’s health. HHNS created the HNRU to support its academic interests by providing educational and research opportunities in the development and testing of natural health products. It is not only central to the University themes discussed above, but also to those of biotechnology and environment.

Overall, HHNS has developed into an interdisciplinary unit that is focused on key aspects of lifestyle, and the biology of human health, in both our educational programs and research activities. We have created the HPC and the HNRU to offer complementary aspects to this focus that go well beyond the traditional university approach. These exemplify our commitment to the study of human health and are a clear demonstration of how we address the mission of the University. We will persist in developing the Department such that both teaching and research activities continue to integrate biological responses from gene expression up to whole body function. We will continue to emphasize interaction between the biology of the human and nutrition and physical activity. It is rewarding that these values are strongly reflected in many reports on health care such ‘Building on Values: The Future of Health Care in Canada’, by Roy Romanow, ‘Healthy Weights, Healthy Lives’ the 2004 annual report by the Chief Medical Officer of Health for Ontario And ‘The integrated Pan-Canadian Healthy Living Strategy’ in 2005 and Healthy Aging in Canada: A new vision, A vital investment: A discussion brief and Report on Seniors’ Falls in Canada (2005). In order to pursue our plan we have developed the following strategic plan:

## **Mission**

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HHNS has two, related missions:

1. To contribute to the University’s twin missions of learner-centredness and research intensiveness within our focus of the biology of human health, by:
  - Providing a high quality, interdisciplinary educational program based in the area of human health that integrates knowledge from genomics through to the biological systems..
  - Conducting high quality research in these disciplines
  - Promoting service/community engagement in health care and health promotion
2. To provide experiential learning opportunities in the biology of human health.

## **Vision**

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1. Support the learner-centered and research intensive missions of the University of Guelph:

Offer undergraduate majors in Guelph-Humber Kinesiology, Human Kinetics, Nutritional and Nutraceutical Sciences and Bio-Medical Sciences that are unique in Canada and that offer broad experiences in physiology, anatomy, nutrition and biomechanics as they apply to human health.

To ensure that the academic preparation of the Human Kinetic and Kinesiology majors can qualify for accreditation by the Ontario College of Kinesiology.

- Conduct research focused on lifestyle and human health. Within this broad field, HHNS will address the issues at the level of the individual, not community or populations. We recognize that to gain a deeper understanding of the health problems, they must be studied at many different levels and with interdisciplinary teams. The research efforts will be focused on understanding the basic underlying biological aspects of health, and further applied to understanding chronic health issues, such as cancer, cardiovascular disease, obesity, type 2 diabetes, neurological/sensory disorders and neuro-musculoskeletal function
- Continue to develop and strengthen associations with departments on campus that share common interests.

- Develop formal departmental associations with other universities in Canada and throughout the world that share common interests. This also extends to Provincial and Federal Ministries. The Department strongly supports the ‘Agriculture-Food-Human Health’ initiative as a means to enhance the ability to address their vision of human health.
- Provide graduate programs that offer advanced experiential learning experiences in the biology of human health.
- To provide experiential learning opportunities in nutritional sciences, physiology, anatomy and neuromechanics within the focus of lifestyle and human health.
- In the formal undergraduate program, HHNS aims to provide quality, contemporary laboratory offerings and opportunities for self directed study.

Within the HPC :

- Provide research and experiential learning environments for faculty, graduate and undergraduate students in important health issues across the lifespan (i.e.) chronic ill health and quality of life, physical activity, nutrition, weight loss (obesity and related illness) and weight gain (increasing or maintaining muscle mass).

Within the HNRU:

- Provide a human research and experiential learning environment for faculty, graduate and undergraduate students in functional foods, genomics, nutraceuticals and natural health products as they apply to human health.

To evolve a long term relationship between the HNRU and members of the Guelph Researchers for Your Personal Health (GRYPH) initiative. GRYPH consists primarily of faculty from HHNS who are establishing a longitudinal cohort from within the Guelph community to develop applications utilizing nutrigenomic approaches for the prevention and management of metabolic diseases (e.g. obesity, diabetes, metabolic syndrome, etc). Joint activities between the HNRU and GRYPH researchers may include, but are not limited to, 1) the coordination of data collection/sample storage from the GRYPH cohort, 2) continuing education and short courses for HQP/professional training in nutrigenomics, and 3) dissemination of study results through seminars/invited speaker seminars.

**Goals**

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1) Undergraduate program:

Continued development:

i) Continue to offer 4 majors in kinesiology, human kinetics, nutritional and nutraceutical sciences and bio-medical sciences and to contribute to the neuroscience major/minor.

ii) Continue to develop our biomechanics and anatomy courses/programs with specific focus on the integration of neuromechanics with functional anatomy

iii) Continue to provide education that is interdisciplinary and directly applicable to the biology of human health.

iv) Continue to develop our offerings in nutrigenomics (encompassing diet, exercise and other lifestyle factors) and metabolomics

v) Continue to incorporate the personnel and facilities of the HPC and HNRU in our formal teaching.

vi) Further enhance the experiential learning opportunities in the HPC and HNRU for the undergraduate students.

vii) To track the outcomes of our undergraduate majors and to monitor their professional success.

### **Future development:**

i) To increase our educational offerings in the rapidly expanding area of nutraceuticals and functional foods. This will be conducted so as to integrate nutrition and physiology of human health issues and will address the topics from genomics to the biological systems.

ii) Provide opportunities for formal exchanges for senior students between our university and others.

iii) Develop collaborative, interdisciplinary academic programs in the health sciences within the University and with other universities.

iv) Develop to expand and integrate this discipline with other fields. This integration will be across academic disciplines such as biomechanics, physiology, genomics and nutrition. It will also engage professional health disciplines.

v) Develop a premiere facility for the teaching of biomechanics with a view for interaction with faculty outside of HHNS and it should include biomechanics applications ranging from tissue to whole body.

vi) To expand and integrate this discipline with other fields and disciplines. This integration will be across academic disciplines such as food science and will engage professional disciplines such as pharmacy and government scientists in AAFC.

vii) The Transitional Council for the College of Kinesiology has recently been formed (Fall 2009). We will ensure that our programs in Human Kinetics and Kinesiology will respond to the recommendations from this board regarding the courses and practical experiences required to become a Certified Kinesiologist within the Province of Ontario.

## 2) Graduate program:

### **Continued development:**

- i) Continue to offer Ph D and both M Sc programs in the biology of human health.
- ii) Continue to develop internal scholarship support for our graduate students.
- iii) Further enhance the experiential learning opportunities in the HPC and HNRU for graduate students

### **Future development:**

- i) Provide opportunities for formal exchange of graduate students between ourselves and other universities.
- ii) Encourage the new faculty to develop and expand their graduate programs.
- iii) Develop graduate activity in association with Humber College and other complimentary groups of scientists.

3) Research:

**Continued development:**

- i) Encourage interdisciplinary research in basic human life sciences as applied to the 'normal', healthy state.
- ii) Continue to focus our research on understanding the underlying biological aspects of chronic diseases (such as arthritis, cancer, cardiovascular health, obesity, type-2 diabetes, neurological/ sensory disorders and neuromusculoskeletal function).
- iii) Animal Care: We must continue to supervise our animal care facility in order to assure high quality service at a reasonable cost.
- iv) Develop a long term staffing and financial support plan for our animal wing.
- v) To explore more efficient use of our existing office and research space.
- vi) To explore opportunities to obtain the use of office and research space beyond that currently allocated to the Department..

**Future development:**

- i) Expand associations with scientists in other departments and at other universities based on mutual interests in order to foster collaborative research. Associations with other groups in Agriculture-Food-Human Health, the Functional Abilities Program (within the RBJ Schlegel-U of Waterloo Research Institute for Aging), the Falls and Mobility Network, the George Brown Orthopedic Group, the Canadian Arthritis Association and the Canadian Memorial Chiropractic College will be encouraged
- ii) To promote greater research activity in the HNRU and closer associations with the faculty.

4) Community engagement:

- i) To encourage faculty to participate in bodies primarily focused on College and University-wide interests, e.g. Food Innovation Network, Animal Care Committee, Senate, and Human Research Ethics Board.
- ii) To continue to promote the University and College by offering community seminars/symposiums/community outreach programs with HNRU and HPC.
- iii) To encourage faculty to be involved in service that profiles Department expertise in the biology of human health. This service would include serving on committees for scientific societies and interacting with the popular media.
- iv) To develop a firm, ambitious plan to reach out to the community through interactions with schools, colleges, service groups, etc. Development of an integrated teaching and research centre is currently underway to interact with healthy, aging and individuals in the workplace and community in the capacity of health education and assessment (e.g. strength, agility, mobility, balance, posture, workplace assessment.)

