

THE UNIVERSITY OF BRITISH COLUMBIA
School of Human Kinetics

COURSE OUTLINE

Course: HKin489b

Course Title: Genetic issues in sports, exercise and human performance

Department/Program: School of Human Kinetics

Year: 2007 (winter, term 2)

Times: Lectures: Tue and Thr 9:30 - 11:00

Location(s): War Mem Gym, rm 20

Instructor: Dr. Jim Rupert

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Office hours: TBA

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***Important: include "HKin 489" in the subject line of ALL E-mails.**

Course description

Human variation in physical performance is due to the combined influence of genetic background ('nature') and the cultural, social, and physical environment ("nurture") in which the person develops. The relative contributions of these two fundamental arbiters of development vary greatly, ranging from the devastating impact of genetic disease to the subtle biological variations that may influence attitude, behavior, and "talent". In this course, students will be introduced to the basic concepts of biological inheritance and innate human variation, with an emphasis on the current understanding of the role of genetic variants in determining human physical performance. This will provide the background for discussions of the various social, cultural and ethical issues associated with the perception of genetically-determined "talent" as well as the application of genetics to athlete recruitment, training and performance enhancement.

Prerequisites and/or Course Restrictions: None. Students with a limited biology background may have to acquire some basic genetics and molecular knowledge; however, students from a sociocultural background who are interested the issues raised by the application of genetics and biotechnology to sports is encouraged to take the course.

Format of the course: There are two 1 ½ hour sessions a week. These will be a mix of formal lectures, discussions, student presentations, relevant media material (e.g. documentaries). The exact nature of this mix will depend on the number of students enrolled as well as their interests and backgrounds.

Course text and materials

There is no text book. The course will be based on on-line materials, research papers and review articles. Material and links will be available via Web-CT.

Course requirements and evaluation

Students will be expected to

- 1) Monitor at least one relevant on-line web site/ news services (e.g. Canadian Center for Sports Ethics) and be prepared to discuss recent developments that pertain to the course.
- 2) complete the on-line Tri-council policy statement Ethics tutorial (note: completion of this tutorial required for graduate students by some research ethics boards)
- 3) review or acquire basic genetic concepts (if necessary) (e.g. <http://www.ncbi.nih.gov/About/primer/>)
- 4) To participate in discussions, ask questions, propose topics for discussion, give presentations to the class, and write at least one paper to be submitted for marking

Grading: students will be graded on participation in class, their presentation(s) and on a written paper (or papers). The exact nature of the evaluation will be determined when the number of students taken the course is known.

Learning objectives

This course is intended for all students who are interested in the myriad scientific, cultural, and ethical issues that surround the role of genetics in determining human physical performance and the application of molecular biological techniques to sport science.

- 1) The principals of genetic: genes and chromosomes, individuals and populations
- 2) genes and the environment: nature, nurture, and the nature of nurture
- 3) The genetics of performance 1: Are some people “gifted”?
- 4) The genetics of performance 2: Are some populations “gifted”?
- 5) Issues of sex: male, female, intersex and transgendered athletes.
- 6) Genetic testing of athletes: should DNA determine who gets to play?
- 7) Genetics of nutrition and training: are there optimum strategies?
- 8) Gene therapy as a doping strategy: is it likely and how to deal with it
- 9) Evolution of the athletic human: why we are what we are

This list is tentative in both content and order. Students are encouraged to propose topics and issues to be discussed.