

536-350 Genes to Phenotype:Control & Integration

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 2, - Taught on campus.
Time Commitment:	Contact Hours: Two hours per week of lectures (total of 24 hours), up to four hours per week of workshops, practicals and computer-based self-directed learning exercises (total of 48 hours) Total Time Commitment: 120 hours
Prerequisites:	521-213 Integrated Biomedical Science I and 536-250 Integrated Biomedical Science II
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	It is University policy to take all reasonable steps to minimise the impact of disability upon academic study and reasonable steps will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact upon their active and safe participation in a subject are encouraged to discuss this with the relevant subject coordinator and the Disability Liaison Unit.
Coordinator:	Prof Stephen Harrap
Subject Overview:	<p>The subject will provide a broad picture of the role of genes in the function and integrated control of cells, tissues and whole organisms, particularly mammals. The aim will be to develop an understanding of the role of genes in the context of whole animals by investigating the embryological, physiological and biochemical consequences of natural genetic variations and experimental genetic manipulations, using contemporary molecular biology techniques. The subject will address issues such as integration and coordinated control of systems and adaptation to change. The juxtaposition of the subject with 521-308 Genome Science complements the emphasis on the fundamental involvement of molecular systems in critical integrated processes.</p> <p>The theme <i>Genotypes to Phenotypes in Reproduction and Development</i> will cover the major principles that underpin the genetic determination of the life processes. The topics to be covered will include: gametes, fertilization, early development through to organogenesis, stem cells, cloning, sexual determination and differentiation, human sexual ambiguity and current genetic techniques in these fields of research.</p> <p>The second theme <i>Genetic Diversity – Model Systems</i> will build on the understanding of genes and healthy phenotypes to consider the ways in which genetic diversity is maintained in populations and from one generation to the next. It will consider the adaptations to environmental stress (insecticides, drug resistance, heavy metals) and internal alterations to genes (monogenic and polygenic traits).</p> <p>The final theme <i>Genotypes to Phenotypes in Disease</i> will explore examples of genes causing quantitative and qualitative variations that may be harmful to individuals. Some examples that will be discussed will include cardiovascular diseases, familial cardiomyopathy, muscular dystrophies and channelopathies (cystic fibrosis, long QT syndrome, epilepsy, and myotonias). The practicals and workshops will incorporate computer-based self-directed learning exercises and reflect the three themes of the subject. The practical component may include visits to relevant research and/or industrial laboratories and complementary library exercises with a view to developing a research proposal in a specific area relevant to material covered in lectures</p>
Assessment:	Three 45-minute written examinations during semester (each worth 25%); ongoing assessment of written reports on the practicals and computer-based self-directed learning exercises throughout the semester (25%).

Prescribed Texts:	None
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	The practical and workshop components of the subject will assist students in developing communication skills (written and oral), critical thinking and analytical skills and participating effectively as a team member.
Notes:	This subject is only available to Bachelor of Biomedical Science students.
Related Course(s):	Bachelor of Biomedical Science