BCMB30002 Functional Genomics and Bioinformatics

Credit Points:	12.5
Level:	3 (Undergraduate)
Dates & Locations:	2015, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 3 x one-hour lectures plus 1 x one-hour tutorial Total Time Commitment: 48 contact hours with an estimated total time commitment of 170 hours.
Prerequisites:	BSc students Before 2009: **Biochemistry & Molecular Biology Part A (521-211)** **Biochemistry & Molecular Biology Part B (521-212)** 2009 and subsequently: **Subject** / **Study Period Commencement:** / **Credit Points:** BCMB20002 Biochemistry and Molecular Biology — Semester 1, Semester 2 — 12.50 Note that the pre-2009 subject "**Biochemistry & Molecular Biology Part A**" and the 2009 subject "**Biochemistry & Molecular Biology**" are not identical despite having the same subject code. Only the subject "**Biochemistry & Molecular Biology**" offered in 2009 and subsequently acts as a stand-alone prerequisite. Other combinations that provide similar background will be considered by the coordinator. BBiomedicine students **Subject** / **Study Period Commencement:** / **Credit Points:** BIOM20001 Molecular and Cellular Biomedicine — Semester 1 — 25
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Students cannot enrol in and gain credit for this subject if they previously obtained credit for the pre-2009 subject **521-302 Functional Genomics**. BBiomedSc students who received credit for **521-308 Genome Science** are not permitted to enrol and gain credit for this subject.
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry. It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: http://services.unimelb.edu.au/disability
Coordinator:	Dr Stuart Ralph

Contact:	Subject Coordinato Dr Stuart Ralph **saralph@unimelb.edu.au (mailto:saralph@unimelb.edu.au)** Adminstrative Coordinator Mrs Irene Koumanelis **i.koumanelis@unimelb.edu.au (mailto:i.koumanelis@unimelb.edu.au)**
Subject Overview:	Knowledge of genome structures from various organisms and the rapid development of technologies that exploit such information are having a big impact in biology, medicine and biotechnology. This subject describes the structure and expression of genomes in higher organisms and provides an understanding of the technologies used to analyse and manipulate genes. Students will learn how the modification of genes in cells and whole organisms can be used to discover gene function or to modify phenotype. The structure of eukaryotic chromosomes is presented to demonstrate how genetic material is replicated and how transcription of RNA is controlled. We illustrate how pathways that regulate RNA and protein are integrated to control cell metabolism and cell fate. The content will cover the bioinformatic techniques used to interpret and extend genomic information. The approaches of functional genomics will be discussed in relation to cancer to illustrate the application of molecular biology to the study of human biology and health.
Learning Outcomes:	By the end of the subject, the student should understand: # current concepts concerning the molecular bases of genome structure and the regulation of gene expression in eukaryotic organisms (yeast, animals and plants) # the role of gene regulatory networks in controlling metabolic and developmental pathways # the theory of recombinant DNA technology and how it is applied in biomedicine and biotechnology # the significance and applications of genome sequencing programs, # bioinformatic techniques and their applications # how gene function can be investigated by recombinant DNA techniques and genetic manipulation of cell lines and whole organisms, # how functional genomics can be applied to the study of human diseases such as cancer.
Assessment:	1,000 word essay assignment due mid-semester (15%) Two tests held during mid-semester (7.5% each) 3 hour written exam held during the examination period (70%)
Prescribed Texts:	Alberts et al, Molecular Biology of the Cell, 5th edition
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:	On completion of this subject, students should have developed the following generic skills: # the ability to interpret scientific literature and interpret data from electronic databases. # the capacity to integrate knowledge across disciplines. # the ability to comprehend a question, evaluate the relevant information and communicate an answer.
Notes:	Students enrolled in the BSc (pre-2008 BSc), BASc or a combined BSc course will receive science credit for the completion of this subject. Students undertaking this subject are expected to have access to an internet-enabled computer.
Related Course(s):	Master of Biotechnology
Related Majors/Minors/ Specialisations:	Agri-food Biotechnology (specialisation of Biotechnology major) Animal Cell Biology (specialisation of Cell and Developmental Biology major) Biochemistry and Molecular Biology Biomedical Biotechnology (specialisation of Biotechnology major)

	Biotechnology (pre-2008 Bachelor of Science) Cell Biology (pre-2008 Bachelor of Science) Immunology Microbiology Reproduction and Development (specialisation of Cell and Developmental Biology major) Science-credited subjects - new generation B-SCI and B-ENG. Selective subjects for B-BMED