

Global Learning Semesters

Course Syllabus

Course: BIOL-270 Molecular Basis of Health and Disease

Department: Health and Life Sciences

Host Institution: University of Nicosia, Nicosia, Cyprus



Course Summary		
Course Code	Course Title	Recommended Credit Hours
BIOL-270	Molecular Basis Of Health And Disease	3
Semester Offered	Contact Hours	Prerequisites
Please contact us	42-45	BIOL-230, BIOL-205
Department	Level of Course	Language of Instruction
Health and Life Sciences	Lower Division	English

Course Description

This course introduces the student to the basis of health and disease by integrating molecular cell biology and biochemistry with current clinical medical information on selected diseases thus linking biology with syndromes, genetic pathways with disease phenotypes and protein function with drug action. The student get exposed to micro- and macromolecular systems of regulation of gene and protein function as they apply in health and disease of major organ systems such as muscle, the nervous system, the eye etc. The course format will be lectures 3h/week and assigned literature.

Prerequisites

BIOL-230, BIOL-205

Topic Areas

1. Bimolecular evolution; genes and proteins
2. Integration of cytogenetics, genetics and physical maps in identifying genetically inherited disorders
3. Signal transduction and communication (cell and tissue/whole body communication)
4. Muscle diseases
5. Human autoimmune diseases; inflammatory diseases
6. Hormones and growth factors; hormonal diseases
7. Neuronal functions and neurological disorders; Huntington's disease
8. Alzheimer's disease
9. Schizophrenia and Bipolar affective disorders
10. Alcoholism
11. Genetic disorders of the human eye
12. Mitochondrial disorders
13. Cell proliferation/apoptosis and ontogenesis; Breast and colon cancer
14. Tissue transplantation; rejection
15. Nucleic acid therapeutic agents

Readings and Resources

Required Textbook

1. Human Molecular Biology : An Introduction to the Molecular Basis of Health and Disease by Richard J. Epstein Publisher: Cambridge University Press; 1st edition (October 24, 2002) ISBN: 052164481X
2. An Introduction to Human Molecular Genetics: Mechanisms of Inherited Diseases by Jack K. Pasternak Publisher: Wiley-Liss; 1st edition (July 15, 1999) ISBN: 1891786032

Recommended Textbooks

1. Molecular Diagnosis of Genetic Diseases (Methods in Molecular Medicine) by Rob Elles, Roger Mountford, Rob, Ph.D. Eil Publisher: Humana Press; 2nd edition (October 1, 2003) ISBN: 0896039323
2. Signal Transduction and Human Disease by Toren Finkel (Editor), J. Silvio Gutkind (Editor) Publisher: Wiley-Liss (May 23, 2003) ISBN: 0471020117
3. Protein Structure and Function by Gregory A. Petsko, Dagmar Ringe Publisher: Sinauer Associates (August, 2003) ISBN: 0878936637
4. Proteins : Structures and Molecular Properties by Thomas E. Creighton Publisher: W. H. Freeman; 2nd edition (August 15, 1992) ISBN: 071677030X
5. Enzymes: A Practical Introduction to Structure, Mechanism, and Data Analysis by Robert A. Copeland Publisher: Wiley-VCH; 2 edition (March 15, 2000) ISBN: 0471359297
6. The Epigenome : Molecular Hide and Seek by Stephan Beck (Editor), Alexander Olek (Editor) Publisher: Wiley-VCH (April 22, 2003) ISBN: 3527304940
7. Genomics: Applications in Human Biology by Sandy B. Primrose, Richard M. Twyman, S. B. Primrose Publisher: Blackwell Publishers (February 1, 2004) ISBN: 1405108193
8. Superantigens: Molecular Biology, Immunology, and Relevance to Human Disease by Donald Y. M. Leung, Brigitte T. Huber, Patrick M. Schlievert Publisher: Marcel Dekker; 1st edition (January 15, 1997) ISBN: 082479813
9. Molecular Biology of the Female Reproductive System by Jock K. Findlay, J.K. Findlay Publisher: Academic Press (March 29, 1994) ISBN: 0122563654
10. Your Future Self: A Journey to the Frontiers of Molecular Medicine by Hank Whittemore Publisher: Thames & Hudson (November 1, 1998) ISBN: 0500542236
11. Molecular Biotechnology: Therapeutic Applications and Strategies by Sunil Maulik, Salil D. Patel Publisher: Wiley-Liss; 1st edition (January 15, 1997) ISBN: 0471116815
12. The Stuff of Life : Profiles of the Molecules That Make Us Tic by Eric P. Widmaier Publisher: Owl Books; 2nd Rep edition (September 1, 2003) ISBN: 0805074376
13. The Molecules Within Us: Our Body in Health and Disease by Charles A. Pasternak Publisher: HarperCollins Publishers (October 1, 1998) ISBN: 0306459876
14. Human Evolutionary Genetics: Origins, Peoples & Disease by Mark A. Jobling, Matthew Hurles, Chris Tyler-Smith, MARK JOBLING Publisher: Garland Science/Taylor & Francis Group (December 1, 2003) ISBN: 0815341857
15. The Genetic Basis of Human Cancer by Bert Vogelstein, Kenneth W. Kinzler Publisher: McGraw-Hill Professional; 2 edition (March 19, 2002) ISBN: 0071370501
16. Molecular Biology of the Cell, Fourth Edition by Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walt Publisher: Garland Science; 4th Bk&Cdr edition (March, 2002) ISBN: 0815332181
17. Human Molecular Genetics, Third Edition by Tom Strachan, Andrew Read Publisher: Garland Science/Taylor & Francis Group; 3rd edition (December 1, 2003) ISBN: 0815341822
18. Molecular Biology of the Gene, Fifth Edition by James D. Watson, Tania A. Baker, Stephen P. Bell, Alexander Gann, Michael Levine, Richard Losick Publisher: Benjamin Cummings; 5 edition (December 3, 2003) ISBN: 080534635X
19. DNA : The Secret of Life by JAMES D. WATSON, ANDREW BERRY Publisher: Knopf; 1st edition (April 1, 2003) ISBN: 0375415467
20. Principles of Biochemistry With a Human Focus by Reginald H. Garrett, Charles M. Grisham, Garrett Publisher: Brooks Cole; 1st edition (May 14, 2001) ISBN: 0030973694
21. ISBN: 0030973694
22. Biochemical Individuality by Roger Williams Publisher: McGraw-Hill; 1 edition (September 11, 1998) ISBN: 0879838930
23. Metabolic Regulation: A Human Perspective by Keith N. Frayn Publisher: Blackwell Publishers; 2nd edition (October 1, 2003) ISBN: 063206384X

24. Analysis Of Multifactorial Diseases (Human Molecular Genetics) by T. Bishop, P. Sham, PAK SHAM, D. Timothy Bishop Publisher: BIOS Scientific Publishers (September 1, 2000) ISBN: 1859961134
25. Molecular Biotechnology: Therapeutic Applications and Strategies by Sunil Maulik, Salil D. Patel Publisher: Wiley-Liss; 1st edition (January 15, 1997) ISBN: 0471116815
26. The Stuff of Life : Profiles of the Molecules That Make Us Tic by Eric P. Widmaier Publisher: Owl Books; 2nd Rep edition (September 1, 2003) ISBN: 0805074376