**ADVANCED CELL BIOLOGY GMS 6421 (Spring-2017)**

Course Director: Satya Narayan PhD ([snarayan@ufl.edu](mailto:snarayan@ufl.edu))

**Lecture Rooms: HPNP G-108, G-109, G-110** [+ R2-265]

**Recommended Reference Book** – *Molecular Biology of Cell*, Sixth Edition, by: Alberts B, Johnson A, Lewis J, Raff M, Roberts K, and Walter P

**Week Day & Date Time Topic Lecture Room**

**1 Membrane biology**

W 01/04/17 3:00-3:50 PM L1: Membrane microdomains Aris G-108

R 01/05/17 3:00-3:50 PM L2: ER - Translocation Aris R2-265

F 01/06/17 3:00-4:40 PM L3. Paper discussion Aris G-110

**2 Secretory pathway**

T 01/10/17 3:00-3:50 PM L4: ER - Protein folding and quality control Aris TBA

R 01/12/17 3:00-3:50 PM L5: Vesicular transport and Golgi Aris R2-265

F 01/13/17 3:00-4:40 PM L6: Paper discussion Aris G-110

**3 Endocytic and lysosomal pathways**

W 01/18/17 3:00-3:50 PM L7: Sorting to lysosomes and endocytosis Dunn G-108

F 01/20/17 3:00-4:40 PM L8: Paper discussion Dunn G-109

**4 Turnover pathways**

M 01/23/17 3:00-3:50 PM L9: Autophagy, lysosomes, proteasomes Dunn G-109

W 01/25/17 3:00-3:50 PM L10: Autophagy and cancer drug development Dunn G-108

F 01/27/17 3:00-4:40 PM L11:Paper discussion Dunn G-110

**5 Cytoskeleton**

M 01/30/17 3:00-3:50 PM L12: Actin dynamics and regulation Holliday G-109

W 02/01/17 3:00-3:50 PM L13: Microtubules and motors in mitosis Holliday G-108

F 02/03/17 3:00-4:40 PM **L14:** **EXAM 1** Narayan G-110

**6 Mitochondria**

M 02/06/17 3:00-3:50 PM L15: Mitochondrial gene defects G-109 Leeuwenburgh

W 02/08/17 3:00-3:50 PM L16: Mitochondrial dynamics G-108 Leeuwenburgh

F 02/10/17 3:00-4:40 PM L17: Paper discussion G-109 Leeuwenburgh

**7 Nucleus**

M 02/13/17 3:00-3:50 PM L18: Nuclear dynamics and architecture Ishov G-109

W 02/15/17 3:00-3:50 PM L19. Heterochromatin and gene silencing Ishov G-108

F 02/17/17 3:00-4:40 PM L20: Paper Discussion Ishov G-109

**8 Epigenetics**

M 02/20/17 3:00-3:50 PM L21: High order chromatin structure Qiu G-109

W 02/22/17 3:00-3:50 PM L22: Epigenetics and gene regulation Qiu G-108

F 02/24/17 3:00-4:40 PM L23: Paper Discussion Qiu G-109

**9 Signal transduction networks**

M 02/27/17 3:00-3:50 PM L24: DNA damage response dynamics Narayan G-109

W 03/01/17 3:00-3:50 PM L25: Drug targets and signaling networks Narayan G-108

F 03/03/17 3:00-4:40 PM L26: Paper Discussion Narayan G-109

**10 MicroRNAs**

M 03/13/17 3:00-3:50 PM L27: MicroRNAs in innate monocyte response Chan G-109

W 03/1517 3:00-3:50 PM L28: MicroRNAs in cancer cell biology Chan G-108

F 03/17/17 3:00-4:40 PM **L29: EXAM 2** Narayan G-109

**11 Cell polarity**

M 03/20/17 3:00-3:50 PM L30: Cell polarity in tissue morphogenesis Linser G-109

W 03/22/17 3:00-3:50 PM L31: Cell polarity and cancer Linser G-108

F 03/24/17 3:00-4:40 PM L32: Paper discussion Linser G-109

**12 Cell cycle**

M 03/27/17 3:00-3:50 PM L33: Cell cycle dynamics and checkpoints Liao G-109

W 03/29/17 3:00-3:50 PM L34: Apoptosis Liao G-108

F 03/31/17 3:00-4:40 PM L35: Paper discussion Liao G-109

**13 Stem cells**

M 04/03/17 3:00-3:50 PM L36: Stem cell pluripotency Terada G-109

W 04/05/17 3:00-3:50 PM L37: Cancer stem cells Terada G-108

F 04/07/17 3:00-4:40 PM L38: Paper discussion Terada G-110

**14 Cellular mechanisms of diseases**

M 04/10/17 3:00-3:50 PM L39: Cell pathogen interactions Daaka G-109

W 04/12/17 3:00-3:50 PM L40: Cell biology of urinary tract infection Daaka G-108

F 04/14/17 3:00-4:40 PM L41: Paper discussion Daaka G-109

**15 Cancer cell biology**

M 04/17/17 3:00-3:50 PM L42: Oncogenes / molecular biology of cancer Zajac-KayeG-109

W 04/19/17 3:00-3:50 PM L43: Inherited cancer syndrome Zajac-KayeG-108

F 04/21/17 3:00-4:40 PM **L44: EXAM 3** Narayan G-109

**SYLLABUS**

**GMS-6421: Advanced Cell Biology**

**(4 credit course)**

**Course Offered:** Fall-semester

**Classes:** M, W, F (lectures 3:00 PM – 3:50 PM, paper discussion and exams 3:00 PM – 4:40 PM)

**Begins**: January 4th through April 21th, 2017

**Building and Room Number:** TBA

**Course Director:** Dr. Satya Narayan

Department of Anatomy and Cell Biology

Basic Science Building, Room B1-016

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**Email:** snarayan@ufl.edu

**Prerequisites:**

Undergraduate biochemistry or cell biology taught in conjunction with 1st year IDP core course. Basic understanding of fundamental mechanisms of cell functions, specializations, and interactions that account for the organization and activities of basic tissues is desired. This course is a requirement for the Molecular Cell Biology (MCB) graduate students. Please email course director or Ms. Kimberly Hodges ([kahodges@ufl.edu](mailto:kahodges@ufl.edu)) in the Department of Anatomy and Cell Biology for enrollments.

**Description:**

This is a revised Advanced Cell Biology Course, which was offered in Spring-2014. In this course we will discuss the molecular basis of cell structure/function at a more advanced level than in the introductory courses of Cell Biology, Molecular Biology and Biochemistry. The focus will be on the current knowledge of the subject matter. On Mondays and Wednesdays, there will be lectures covering the latest information in the literature. On Fridays, it will be publication-based “hot-topic review or article” discussion. The presentation/discussion will elaborate the merits and demerits of the methods used in the study. Topics include membrane biology, secretory pathways, vesicular trafficking, mitochondrial dynamics, nuclear organization and function, turnover pathways, cytoskeleton, miroRNAs, epigenetics, signal transduction networks, cell polarity, stem cells, cellular mechanisms of diseases, and cancer cell biology. Discussion will range from basic studies to applications to human diseases. Students will also be introduced to how critically evaluate the scientific literature.

The text book “Molecular Biology of the Cell – by Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts and Peter Walter: Sixth Edition”, will serve as a general reference. However, reading from the literature will be necessary to cover the latest information.

**Grading:**

There will be three (3) – two hour examinations. All three examinations will be composed of short answers or multiple choice and other question types.