Topics in Membrane Biology (MCDB 5425, 3 credits) Spring 2020

MWF 10-10:50 AM, in Gold A1B60

Instructor:
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Schedule:

Section 1 Background and Methods

Week 1
January 13 Lecture
January 15 Lecture
January 17 Lecture

Week 2
January 20 University Holiday, no class.
January 22 Lecture
January 24 Lecture

Section 2 Cholesterol Homeostasis

Reference: Brown and Goldstein, 2009 Journal of Lipid Research.

Week 3
January 27 Lecture
January 29 Instructor-led discussion of Briggs et al 1993 JBC
(Class discussion) Wang et al 1993 JBC
January 31 (Class discussion) Yokoyama et al 1993 Cell

Week 4
February 3 Tapper and Ahrens: Wang et al 1994 Cell
February 5 Almotery and Nguyen: Sakai et al 1996 Cell
February 7 Alotaibi and Brandt: Hua et al 1996 Cell

Homework 1: Due at 9 AM on February 10.

Week 5
February 10 Elzaridi and Calo: Rawson et al 1997 Molecular Cell
February 12 Gerace and Fandl: Zelenski et al 1999 JBC
February 14 Hammermeister Suger and Morawiec: DeBose-Boyd et al 1999 Cell

Week 6
February 17 Ivy and Wang: Yang et al 2002 Cell
February 19 Jardine and Kareem: Matsuda et al 2001 Genes and Development
February 21 Kemp and Kennedy: Kamisuki et al 2009 Chemistry and Biology

Homework 2: Due at 9 AM on February 24.

Week 7
February 24 Review session. Attendance is optional.
February 26 Guest lecture.
February 28 Mid-term exam in class.

Section 3 Glucose Homeostasis

References: *Bryant and James, Nature Reviews, 2002*
Antonescu et al, Cold Spring Harbor Perspectives in Biology, 2014

Week 8
March 2 Lecture
March 4 Knight and Ly: Krus et al 2014 Cell Metabolism
March 6 Patel and Pickersgill: Zisman et al 2000 Nature Medicine

Week 9
March 9 Raygoza and Sapp: Min et al 1999 Molecular Cell
March 11 Stritzel and Wong: Jewell et al 2011 JCB
March 13 Tapper and Ahrens: Eguez et al 2005 Cell Metabolism

Homework 3: Due at 9 AM on March 16.

Week 10
March 16 Almotery and Nguyen: Sano et al 2007 Cell Metabolism
March 18 Alotaibi and Brandt: Fukuda et al 2009 Diabetes
March 20 Elzaridi and Calo: Tan et al 2015 JBC

Week 11
Spring break. No classes.

Week 12
March 30 Gerace and Fandl: Ahfeldt et al 2012 Nature Cell Biology
April 1 Hammermeister Suger and Morawiec: Chaurasia et al 2019 Science (first half)
April 3 Ivy and Wang: Chaurasia et al 2019 Science (second half)

Homework 4: Due at 9 AM on April 6.

Section 4 Emerging Topics in Membrane Biology

Week 13
April 6 Lecture
April 8 No class due to presenter illness.
April 10 Kemp and Kennedy: Fedry et al 2017 Cell

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Week 14

April 13	Knight and Ly: Valansi et al 2017 JCB
April 15	Patel and Pickersgill: Bi et al 2017 Science
April 17	Jardine and Kareem: Messenger et al 2018 JCB

Homework 5: Due at 9 AM on April 20.

The previously scheduled seminar by Dr. Axel Brunger was cancelled. Instead, watch a video of a seminar given by Dr. Brunger. You need to watch the video to complete homework 5.
https://www.bnl.gov/video/index.php?v=580

Week 15

April 20	Raygoza and Sapp: Chen et al 2015 Cell
April 22	Stritzel and Wong: Ying et al 2017 Cell (first half)
April 24	Chun Wan (guest): Ying et al 2017 Cell (second half)

Homework 6 - Outline of final paper: Due at 9 AM on April 24.

Week 16

April 27	(Class discussion): Wang et al 2020 Cell (ACE2-CoV-2 structure)
April 29	Review session through Zoom. Attendance is optional.
May 1	No class. Finishing the final paper.

Final paper: Due at 9 PM on May 1.

Textbooks:
Suggested textbooks for general references:
Cell and Molecular Biology (6th edition or later, Karp)
Molecular Biology of the Cell (5th edition or later, Alberts)
Molecular Cell Biology (6th edition or later, Lodish)

You will learn the topics mainly through lectures and assigned readings. You are required to understand the lectures and the papers to be discussed in class; other reading materials are for your reference only.

Homework:
There are six homework assignments during the course. Paste your answer into the text box or upload a Docx or PDF file.

Grading:

20%	Class attendance
20%	Homework assignments
20%	Oral presentations and participation in classroom discussions
20%	Mid-term exam
20%	Final paper

Office hours:
Monday 11 AM to noon. Other time by appointment