

01:146:480 Advanced Cell Biology II (Spring Semester 2021)

Meeting schedule: Classes meet **remotely and synchronously through Zoom-CANVAS** twice per week on **Tuesdays and Fridays, Period 2 (10:20 AM – 11:40 AM)**.

Course Coordinator: Prof. Gabriella D’Arcangelo (darcangelo@dls.rutgers.edu)

Additional Teaching Faculty: Prof. Megerditch (Mike) Kiledjian (kiledjian@biology.rutgers.edu); Prof. Max Tischfield (tischfield@dls.rutgers.edu).

Office Hours: By arrangement with individual instructors. There will also be in-class review sessions offered prior to exams—these will be announced in Canvas.

Learning Goals:

1. *Master factual and conceptual knowledge in cell biology that will provide a solid foundation for success in research or health professional careers.*
2. *Use scientific reasoning to evaluate the potential for current research and new discoveries to improve our understanding of cell biology and its relevance to human diseases.*

These goals are consistent with those set by the Department of Cell Biology and Neuroscience, as well as the Division of Life Sciences at Rutgers University.

Course Description:

This course addresses advanced concepts of cell biology, focusing on mRNA processing, signal transduction, and cell movement.

Course Structure and Requirements:

- The only **pre-requisite** for this course is:
 - **Fundamentals of Cell and Developmental Biology (01:146:270)**.

Please note that **Fall Adv Cell Bio I (01:146:470) is NOT a requirement** for this course. The content of Fall Adv Cell Bio I and Spring Adv Cell Bio II courses is different, although the level and structure of these courses are similar. Both courses count toward the advanced course requirements for the CBN major and can be taken independently. Also, please note that this **Spring Adv Cell Bio II course is very similar to Spring Adv Cell Bio (01:146:470)** offered in previous years, even though the course number has changed. **Credits will not be given for both Spring courses.**

- The course consists mainly of classes run by CBN faculty members. The classes are organized into 3 modules, each focusing on the research expertise of the teaching faculty member.
- Students are expected to read assigned textbook chapters, research papers or other material occasionally assigned by the teaching faculty, or watch videos posted on the course site.

Exams and Grading Policy:

- **Three synchronous 80-minute remote exams** scheduled during regular class periods at the end of each module will count for **57%** of the final grade (**19% per exam**).
- There will be **NO cumulative final** exam.
- **Asynchronous quizzes** will be offered during each module and will count for **43%** of the final grade.

- Questions during class are welcomed but class participation will not be graded.
- Students with disabilities requesting accommodations must follow the procedures outlined at <https://ods.rutgers.edu/students/registering-for-services>
- Full disability policies and procedures are at <https://ods.rutgers.edu/>

Academic Integrity Policy:

<http://academicintegrity.rutgers.edu/academic-integrity-policy/>

Violations include: cheating, fabrication, plagiarism, denying others access to information or material, and facilitating violations of academic integrity.

Students are required to take the *Honor Pledge*:

"On my honor, I pledge that I have neither given nor received any unauthorized aid on this (exam, test, paper)."

Course Materials:

- Recommended Text (2016): MOLECULAR CELL BIOLOGY, by Lodish, Berk, Kaiser, Krieger, Bretscher, Ploegh, Amon and Martin, 8th Edition; WH Freeman. ISBN-13:978-1-319-04387-2
- Lecture notes, recordings, and primary research literature assigned by the instructors will be posted in Canvas
- All course materials are copyrighted by the university and the individual instructors. Unauthorized distribution of these materials could violate the University Academic Integrity Policy and may subject you to disciplinary action

Self-Reporting Absence Application:

Students are expected to attend all classes; if you expect to miss one or more classes, please use the University absence reporting website <https://sims.rutgers.edu/ssra/> to indicate the date and reason for your absence. An email is automatically sent to the course director.

Student-Wellness Services:

Just In Case Web App

<http://codu.co/cee05e>

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

Counseling, ADAP & Psychiatric Services (CAPS)

(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901/ www.rhscaps.rutgers.edu/
 CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

Crisis Intervention: <http://health.rutgers.edu/medical-counseling-services/counseling/crisis-intervention/>

Report a Concern: <http://health.rutgers.edu/do-something-to-help/>

Violence Prevention & Victim Assistance (VPVA)

(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / www.vpva.rutgers.edu/

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

Disability Services

(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / <https://ods.rutgers.edu/>

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>.

Scarlet Listeners

(732) 247-5555 / <http://www.scarletlisteners.com/>

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.

Tentative Class Schedule (subject to update)

| Class | Date | Day | Lecturer - Topic | Lecture or Class Activity | Reading Assignment |
|-------|------------|-----|--|---|--|
| 1 | 01/19/21 | Tue | Prof. D'Arcangelo | INTRODUCTION | |
| 2 | 01/22/21 | Fr | Prof. Mike Kiledjian - Gene expression and protein translation | Post-Transcriptional RNA Processing -An Overview | Ch 10.1 |
| 3 | 01/26/21 | Tue | | Regulation of Pre-mRNA Processing I | Ch 10.2-10.3, 13.6 & Notes |
| 4 | 01/29/21 | Fr | | Regulation of Pre-mRNA Processing II | Ch 10.4 & Notes |
| 5 | 02/02/21 | Tue | | Regulation of Pre-mRNA Processing III | Ch 10.5 & Notes |
| 6 | 02/05/21 | Fri | | RNA Therapeutics in Genetic Disorders | Notes |
| 7 | 02/09/21 | Tue | | RNA Vaccines (SARS-CoV-2) | Notes |
| 8 | 02/12/21 | Fri | | Bench to Bedside; Development of Therapeutics | Notes |
| 9 | 02/16/21 | Tue | | Module review | |
| 10 | 02/19/21 | Fri | | EXAM 1 | |
| 11 | 02/23/21 | Tue | | Prof. Gabriella D'Arcangelo - Signal transduction | Signal Transduction I- Ligands and surface receptors |
| 12 | 02/26/21 | Fri | Signal Transduction II- G Protein-Coupled Receptors | | Ch 15.3 - 15.4 |
| 13 | 03/02/21 | Tue | Signal Transduction III- cAMP and Calcium signaling | | Ch 15.5 - 15.6 |
| 14 | 03/05/21 | Fri | Signal Transduction IV- Receptors and associated kinases | | Ch 16.1 - 16.3 |
| 15 | 03/09/21 | Tue | Signal Transduction V- Common signaling pathways | | Ch 16.4-16.7 |
| 16 | 03/12/21 | Fri | Signal Transduction VI- Signal integration | | Ch 16.8, Notes |
| | | | | | RU Spring Break |
| 17 | 03/23/21 | Tue | | Special research lecture (TBA) | |
| 18 | 03/26/21 | Fri | | Module review | |
| 19 | 03/30/21 | Tue | | EXAM 2 | |
| 20 | 04/02/21 | Fri | Prof. Max Tischfield - Cytoskeletal organization and movement | Cytoskeleton I-Principles of Actin dynamics and regulation | Ch 17.1-17.4 |
| 21 | 04/06/21 | Tue | | Cytoskeleton II-Actin associated proteins and cellular organization | Ch 17.4-17.7 |
| 22 | 04/09/21 | Fri | | Regulation of Microtubule Structure and dynamics | Ch 18.1-18.4 |
| 23 | 04/13/21 | Tue | | Cytoskeletal Motor Proteins and Cell Division | Ch 18.5-18.8 |
| 24 | 04/16/21 | Fri | | Cytoskeleton and Disease | Notes |
| 25 | 04/20/21 | Tue | | Integrating Cells Into Tissues: Extracellular Matrix I | Ch 20.1-3 |
| 26 | 04/23/21 | Fri | | Integrating Cells Into Tissues: Extracellular Matrix II | Ch 20.4-.20.5 |
| 27 | 04/27/21 | Tue | | Special research lecture (TBA) | |
| 28 | 04/30/21 | Fri | | Module review | |
| | FINALS TBA | | | EXAM 3 | |