

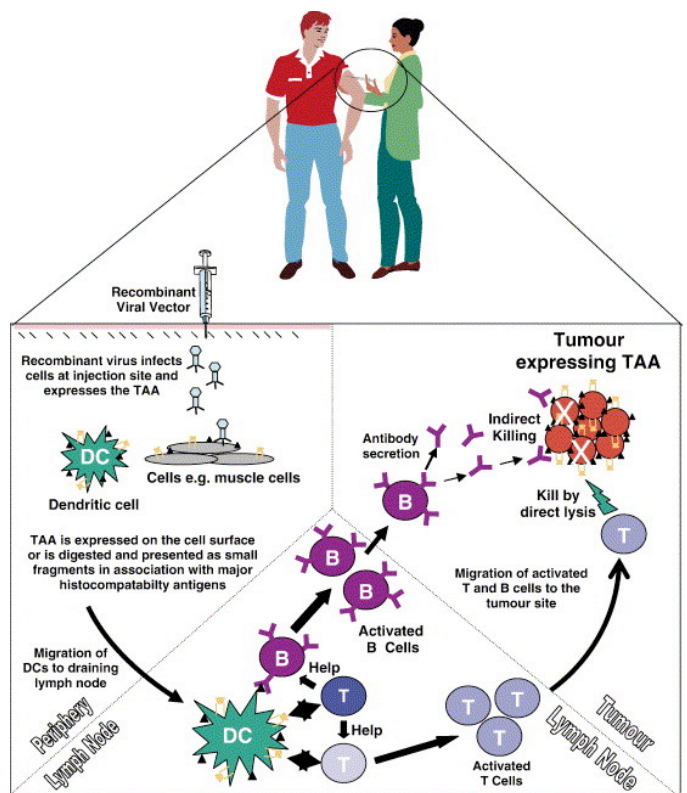
# "Viruses: Applications in Health and Technology"

BIOL 6000/8000

**Instructor: Valery Z. Grdzlishvili, Ph.D.**  
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CRN: 15328  
Duration: Aug 23, 2013 - Nov 29, 2013  
Class meets: Fridays, 9-11:45AM

**Final Exam: Dec 13, 8-10:30AM**



Harrop et al. Recombinant viral vectors: cancer vaccines. *Adv Drug Deliv Rev.* 2006 58:931-47.

This is a discussion-oriented course with an emphasis on modern applications of various viruses in health and technology. All students interested in cell/molecular biology, biotechnology, immunology, cancer biology or gene therapy are encouraged to participate. The course will begin with introductory lectures to provide background for more advanced readings. Students will lead the discussion of selected research papers in different areas of Virology with a focus on the following 8 "hot" applications of viruses:

1. Viral vectors and gene therapy
2. Using viruses to make vaccines against viral and other diseases
3. Oncolytic viruses - using viruses to treat cancers
4. Application of viral nanoparticles in medicine
5. Bacteriophages as therapeutical agents
6. Exploiting plant viruses to combat human and animal diseases
7. Using viruses for biological pest control

**REQUIRED TEXTBOOK:**

**"Viruses: Biology, Applications, and Control"**

Author(s): David Harper, ISBN: 9780815341505, Publication Date: June 20, 2011

## Syllabus (2.5-hour lectures, every Friday 9-11:45 AM)

### Class/

### Date TOPIC

- Class 1 Part 1: *Basics*: Introduction to Virology (Book Pages 1-13, 21-40)  
(Aug 23) Part 2: *Basics*: How to study viruses: general virological methods (Book Pages 233-256)
- Class 2 Part 1: *Basics*: Life cycles of DNA and RNA viruses (Book Pages 41-64, 257-281)  
(Aug 30) Part 2: *Basics*: Pathogenesis of viral diseases (Book Pages 14-20)
- Class 3 Parts 1/2: *Basics*: Viruses and the immune system (Book Pages 65-96)  
(Sep 6)
- Class 4 Part 1: *Basics*: Emergence, spread and extinction of viruses (Book Pages 185-215)  
(Sep 13) Part 2: *Basics*: Antiviral drugs (Book Pages 131-162, 284-297)
- Class 5 Part 1: TEST 1 ( 1h)  
(Sep 20) Part 2: Lecture by VG: “Viral vectors and gene therapy 1” (Book Pages 163-168, 217-233)
- Class 6 Part 1: Student 1 presents a paper on “Retroviral gene therapy vectors”  
(Sep 27) Part 2: Lecture by VG: “Viral vectors and gene therapy 2” (Book Pages 163-168, 217-233)
- Class 7 Part 1: Student 2 presents a paper on “AAV gene therapy vectors”  
(Oct 4) Part 2: Lecture by VG: “Virus-based vaccines” (Book Pages 97-129)
- Class 8 Part 1: Student 3 presents a paper on “Virus-based vaccines”  
(Oct 11) Part 2: Lecture by VG: “Oncolytic viruses – using viruses to treat cancers”  
(Book Pages 233-256)
- Class 9 Part 1: Student 4 presents a paper on “Oncolytic viruses - killing cancers”,  
(Oct 18) Part 2: Lecture by VG: “Oncoviruses: viruses causing cancer” (Book Pages 17-19)
- Class 10 Part 1: Student 5 presents a paper on “Immunovirotherapy of cancers”  
(Oct 25) Part 2: Lecture by VG: “Bacteriophages as therapeutical agents”  
(Book Pages 177-184)
- Class 11 Part 1: TEST 2 ( 1h)  
(Nov 1) Part 2: Student 6 presents a paper on “Bacteriophages as therapeutical agents”
- Class 12 Part 1: Lecture by VG: “Using viruses for biological pest control” (Book Pages 171-177)  
(Nov 8) Part 2: Students 7 presents a paper on “Using viruses for biological pest control”
- Class 13 Part 1: Lecture by VG: “Exploiting plant viruses to combat diseases”  
(Nov 15) Part 2: Students present papers on “Exploiting plant viruses...”
- Class 14 Part 1: Students present papers: “Using viruses in biotechnology/ nanoscience”  
(Nov 22) Part 2: Pre-Final Review of the entire course

Dec 13, 8-10:30 AM FINAL

## Grading:

Letter grades will be assigned on a 5-point scale (A=92-100%, B=82-91%...)

The following will be used to determine your grade:

2 mid-terms tests (Tests 1 and 2) = 20% of final grade each (40% total contribution)

Participation: 15% total contribution

Paper Presentation(s)= 15% total contribution

1 Final (Test 3) = 30% total contribution

## Bonus points:

If you attended every single lecture (with less than 15 min absence from each class), you will get extra **2 bonus points** to your final grade. **Important - you cannot get these bonus points if you missed any lecture regardless of your excuse.**

## Important rules:

1. Attendance is absolutely required!
2. Come and leave on time!
3. You can miss only one 2.5-h class (and loose your bonus points), but each additional absence will result in 4 point deduction from your final grade.
4. Do not schedule your "doctor appointments"/etc. during class.
5. Do not be late for my class – plan your lab experiments correspondingly.
6. Absolutely no cell phones during class.
7. No walking in/out during the class (unless an emergency).
8. Any lecture or paper material can be in your Test or quizzes.
9. Concepts are the key – try to understand not to memorize.
10. I expect you to have a basic knowledge of Molecular Biology, it is your responsibility to revisit it if you need.
11. Slides will be posted to Moodle

**Code of Student Academic Integrity:** Students have the responsibility to know and observe the requirements of the UNC Charlotte Code of Student Academic Integrity. This code forbids cheating, fabrication or falsification of information, multiple submission of work, plagiarism, abuse of academic materials, and complicity in academic dishonesty. <http://legal.uncc.edu/policies/ps-105.html>

**Disability Resource:** If you have a disability that qualifies you for academic accommodations, please provide a letter of accommodation from Disability Services in the beginning of the semester. For more information regarding accommodations, please contact the Office of Disability Services at 704-687-4355 or stop by their office in Fretwell 230

UNC Charlotte strives to create an academic climate in which the dignity of all individuals is respected and maintained. Therefore, we celebrate diversity, which includes, but is not limited to, disability, age, culture, ethnicity, gender, language, race, religion, sexual orientation, and socio-economic status.