

About the Instructor



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Welcome

Welcome to our summer Bench Fundamentals course. I hope you come away with a better understanding of bench research and its application in the biomedical research setting. This course is now in its 7th year. And for the second time we will be offering the course in a blended (half online/half face-to-face) format. See the Course Schedule further down in this document for details. We are excited about this new format and hope this will give you more flexibility in completing the course requirements.

Instructor Bio

I was raised in Seattle, WA. After earning a BA in biology/chemistry at Scripps College, Claremont, CA, I came to Washington University in 1994 to join the MSTP program. I began medical training at WU in 1994, and then joined the lab of Dr. Skip Virgin, studying the role of IFN-gamma in antiviral defense against murine cytomegalovirus. I completed my PhD work in 1999 and returned to medical school, completing both MD and PhD degrees in 2001. I stayed at Barnes for residency and fellowship in Medicine and Infectious Disease, doing research work in the laboratory of Dr. Marco Colonna. I then worked with Drs. Skip Virgin and David Wang to develop methods for the Pathogen Discovery facility, and continue to do work with them on novel virus discovery and metagenomics. My clinical interests are in the care of HIV and HCV positive patients, and I transitioned to doing primarily clinical research in the Washington University Infectious Disease Clinical Research Unit (ID-CRU) since 2006. I have been the medical director of the ID CRU since 2012.

Research Interests

I am interested in understanding how emerging viruses and the microbiome contribute to the pathogenesis of HIV disease. The HIV epidemic has evolved significantly in the 27 years since the virus was first discovered. Current therapy with highly active antiretroviral agents (HAART) has

allowed us to prolong the life and improve the immune competence of patients living with HIV. However, we are beginning to see non-AIDS defining illness affect our HIV patients, including high rates of cardiovascular, renal and liver disease. My research interests include identifying and characterizing the microbiome/virome in the pathogenesis of HIV infection and its complications. My clinical interests include improving the care of HIV infected patients. We aim to methodically develop clinical care plans to improve the treatment and outcomes of HIV infected patients, especially those coinfecting with HCV, or suffering from other non-AIDS defining conditions.

Teaching Philosophy

My goal for this course is to provide students with a hands-on laboratory experience as well as the background information and resources needed to put that experience in the larger context. I hope students come away with a better understanding of laboratory practices to apply to their own translational research. I am passionate about expanding translational research, and feel strongly that we need to create more opportunities for clinician scientists to be involved in bench to bedside research at WU.

About This Course

Required Texts: *none*

Other Course Materials: *Lab Manual will be provided via Blackboard and hardcopy during lab*

Course Description:

This course will introduce fellows-in-training and future physician scientists to the core principles of scientific investigation. This unique two-week intensive format will combine the theoretical knowledge with practical, hands-on application to provide students with an understanding of common and new innovative research approaches used in current scientific endeavors. Course lectures will highlight the following areas: molecular medicine; biospecimens and tissue banking; gene expression; immunoassays and controls; immunolocalization techniques; flow cytometry and cell sorting; cell signaling; sequencing technologies; microarray and related technologies; proteomics and mass spectroscopy; animal models and bioinformatics. The lectures will be complemented by hands-on laboratory experiences in ELISA, DNA Extraction & PCR, Electrophoresis, Western Blot, and Basic Lab Animal Handling.

Goals of the Course:

By the end of this course, participants will be able to:

- Understand fundamental and major concepts in molecular and cellular biology, biochemistry, immunology, and genetics and how they can be applied to clinical research questions.
- Explain when and how to use common laboratory techniques such as sequencing, immunoassays, proteomics, and FACS to answer clinical questions
- Perform laboratory assays such as nucleic acid extraction, running gels, blotting and hybridization, ELISA, sequencing and basic animal handling under appropriate supervision
- Generate appropriate contacts and become aware of university resources and core facilities which can facilitate research

Technology Requirements:

As a student in an online course, you are expected to have access to reliable internet access. If you have computing problems, it is your responsibility to address these or to use campus computing labs. Problems with your computer or other technology issues are not an excuse for delays in meeting expectations and missed deadlines for the course. If you have a problem, get help in solving it immediately. At a minimum, you will need the following software/hardware to participate in this course:

1. Computer with an updated operating system (e.g. Windows, Mac, Linux)
2. Updated Internet browsers ([Apple Safari](#), [Internet Explorer](#), [Google Chrome](#), [Mozilla Firefox](#))
3. Ability to navigate the [Blackboard Learning Management System](#)
4. Minimum Processor Speed of 1 GHz or higher recommended.
5. DSL or Cable Internet connection or a connection speed no less than [6 Mbps](#).
6. Media player such as [VLC Media Player](#).
7. [Adobe Flash player \(free\)](#)
8. [Adobe Reader or alternative PDF reader \(free\)](#)
9. [Oracle Java plugin \(free\)](#)
10. [Microsoft Silverlight plugin \(free\)](#)

Time Requirements

Online component:

When this class is offered in an entirely face-to-face format, students spend 25 hours in class attending lectures, plus time outside of class reviewing the Lab Manual. The online version is no different in terms of expectations for your involvement. This is an active online course that requires you to review the lecture material and complete comprehension quizzes. Additionally you should review the Lab Manual prior to beginning the face-to-face lab practice component. That means that you need to plan to spend a minimum of **25 hours during the week of July 17-21** on activities related to this course. Note, we will make the course available before July 17th if you want to begin reviewing materials earlier. If you are worried about your preparedness, consider taking the [Online Readiness Survey](#) to help decide if an online course is right for you.

Face-to-Face Lab Practice:

The laboratory practice component of this class will run from **Monday-Friday during the week of July 24-28**. **Most days the lab will start at 10am and run until 4pm (see schedule below). **Note you will be assigned to attend animal laboratory training one of the days of the face-to-face week. **This one day you will start at 9am.** **

Course Schedule

(subject to modification)

WEEK 1: July 17 – 21 ONLINE (All materials linked in [Blackboard](#))

Component	Due Date
Complete the Washington University PERCSS module (note if you have already completed this for another course or other external requirement, e-mail Jen McKanry so she can confirm with OVCR and apply the appropriate credit toward this course).	All items must be completed by end of business July 21 st . However, it is STRONGLY recommended that you space out the work of reviewing these online materials throughout your first week in the course. It will take you at least 25 hours to review them all.
Complete the Washington University online Lab Safety Training	
Review all videos in the “Required” folder in the Blackboard course. Complete the quiz for each video. Note some quizzes will be imbedded throughout the video. Others will be a traditional Blackboard quiz with a link below the video link.	
Review at least 2 of the elective videos and complete the corresponding surveys	
Review the Lab Manual	July 24, 2017

WEEK 2: July 24 – 28 Face-to-Face

	July 24	July 25	July 26*	July 27*	July 28
9:00-10:00am			Animal lab, group 1	Animal lab, group2	Digest plasmid, electrophoresis
10:00-11:00am	ELISA	Electrophoresis	Set up minipreps	Western blot II	
* 11:00-12:00pm					
12:00-1:00pm	lunch	lunch	lunch	lunch	lunch
1:00-4:00pm	DNA extraction and PCR	Purification, Ligation and transformation	Western blot I	Minipreps	Select clones for sequencing Bioinformatics overview

*Students will be broken up into groups of 6-10 to take an animal techniques course at CID (825 S. Taylor Ave) from 9-10:30 on Wednesday or Thursday morning from 9-10:30. On Wednesday, group 1 should arrive at 9:00 at CID for the animal course; group 2 does not need to come to the course until 11:00. On Thursday, group 2 should arrive at 9:00 at CID for the animal course; group 1 does not need to come to the course until 11:00.

Assessment/Grading

Grade Composition:

This course is a Pass/Fail course. Requirements to pass the course include:

- Completing all required online components, and scoring at least 80% on the knowledge quizzes, by July 21, 2017
- Reviewing at least 2 of the optional videos and corresponding surveys by July 21, 2017
- Reviewing the Lab Manual by July 24, 2017
- Participating at least 75% of the lab sessions the week of July 24-28, 2017 (any absences must be excused by the coursemaster)
- Adhering to the conduct expectations as outlined in the policy portion of this syllabus.

Course Policies

Participation (expectations)

- It is vitally important that our classroom environment promote the respectful exchange of ideas. This entails being sensitive to the views and beliefs expressed during discussions whether in class or online.
- Your success in this course will heavily depend on your ability to communicate, engage and participate in all course activities. Successful completion of this course requires that a student keep up with all assignments and prep work for the lab components.

If you are unable to participate in the scheduled class activity or discussions you must notify the instructor within the week of that class module or discussion. **An unexcused failure to engage or participate with the class will be counted as an absence; unexcused absences may result in failure.** The instructor reserves the right to make judgment to accept and/or make-up assignments missed because of failed participation in the course activities.

Attendance Policies

- *Present* in class for online courses is determined by participation in an “academically related activity,” i.e. submission of an assignment, assessment or discussion forum posting. The last day of attendance is the last day a student is academically participating in the online course.
- Documentation that a student has logged into an online class is not sufficient by itself to demonstrate academic attendance.

Academic Integrity/Plagiarism

- Academic dishonesty is a serious offense that may lead to probation, suspension, or dismissal from the University. One form of academic dishonesty is plagiarism – the use of an author's ideas, statements, or approaches without crediting the source. Academic dishonesty also includes such acts as cheating by copying information from another student. **Plagiarism and cheating are not acceptable.**
- Academic dishonesty will be reported to the Office of the Registrar for possible action. The instructor will make an academic judgment about the student's grade on that work and in that course. The CRTC process regarding academic dishonesty is described in the [CRTC Guidelines for Academic and Non-Academic Transgressions](#)

CRTC Academic Policy Guidelines

Guidelines regarding CRTC course registration and enrollment, grades, tuition obligation, and academic leave are consolidated in the [CRTC Academic Policy Guidelines](#). Please take a moment to review this document.

CRTC Guidelines for Academic and Non-Academic Transgressions

By registering for this course you have agreed to the terms of the [CRTC Guidelines for Academic and Non-Academic Transgressions](#). If you have not already reviewed this policy, please be sure to before beginning any CRTC related coursework.

Title IX Policies

Mandatory Reporting: Under Title IX, all Washington University faculty, staff, and administrators (with limited exception) are obligated to report any incidents of sexual harassment, sexual misconduct, sexual assault, or gender discrimination to the Student Affairs office and/or other University officials. This ensures that all parties are protected from further abuses and that victim(s) are supported by trained counselors and professionals.

Technical Support

If you have any technical problems accessing [Blackboard](#) please e-mail [Jennifer McKanry](#) immediately. If you are having problems accessing the videos, modules and other materials, check out the Technical Problems Discussion Board to see if other students are having similar problems, and if no related discussion exists start one. Alternately you are welcome to e-mail [Jennifer McKanry](#), however use of the discussion board is preferred as this allows other students who might be struggling with the same problem to collaboratively learn the solution.

Disability Policy

Washington University is committed to providing accommodations and/or services to students with documented disabilities. Washington University's [Cornerstone: Center for Advanced Learning Disability Resources](#) is the University's official resource for students with disabilities and students with suspected disabilities. DR assists students with disabilities by providing guidance and accommodations to ensure equal access to our campus, both physically and academically. To learn more about its services, initiate the process of formal documentation and/or to arrange for accommodations, please contact [Disability Resources](#) at the start of the course.