

# Syllabus

## ANTIMICROBIALS

Biology 6750-007(42613/4750-003 (44154) Fall 2017

(created 8-4-17)

**Readings and discussions on current topics related to antibacterial, antifungal, antiviral, antiprotozoan drugs including cellular/molecular targets, mechanisms of action, resistance, innate immunity, discovery and syntheses.**

**Instructor:** Jon Y. Takemoto, Department of Biology [jon.takemoto@usu.edu](mailto:jon.takemoto@usu.edu)  
office BNR 353, Tel: 797-0671

**Format:** Reading, review, and analysis of recent original literature with group discussions, presentations by the instructor and course enrollees.

**Meeting Time and Location:** TTH 10:30 am - 11:45 pm Huntsman Hall 126

**Textbook:** None required

### Suggested General References:

- Abigail A. Salyers, Dixie D. Whitt 2005. *Revenge of the Microbes: How Bacterial Resistance is Undermining the Antibiotic Miracle* ASM Press, Wash DC ISBN 978-1-55581-298-0.
- Stuart B. Levy. 2002 *The Antibiotic Paradox: How the Misuse of Antibiotics Destroys Their Curative Powers*. Plenum Press, (paperback available, Perseus Publishing)
- Madigan, M.T. et al. 2012. *Brock Biology of Microorganisms*, 13th ed. Pearson Benjamin Cummings

**Grading:** Based on literature research paper/class presentation (66.7%) + 2 exams (33.3%) (details will be discussed)

**Students with disabilities:** *Students with physical, sensory, emotional or medical impairments may be eligible for reasonable accommodations in accordance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973. All accommodations are coordinated through the Disability Resource Center (DRC) in Room 101 of the University Inn, 797-2444 voice, 797-0740 TTY, or toll free at 1-800-259-2966. Please contact the DRC as early in the semester as possible. Alternate format materials (Braille, large print or digital) are available with advance notice.*

## Schedule Fall Semester 2017      Antimicrobials (BIOL4750/6750)

### Topic

### Date

I. Introduction

Aug 28 (Takemoto)

II. Antimicrobials

A) Antibacterial		
Bacterial cell surface (no meeting)	Aug 31 (Takemoto) Sept 5	
Cell surface inhibitors	Sept 7	Papers 1, 2
Protein synthesis inhibitors	Sept 12	Paper 3
Other inhibitors	Sept 14	Paper 4
B) Antifungal		
Sterol biosynthesis inhibitors	Sept 19	Paper 5
Other antifungals	Sept 21	Paper 6
C) Anti-Tuberculosis		
TB and inhibitors	Sept 26	Paper 7
D) Antimicrobial testing (lab)	Sept 28/Oct 3 (lab BNR306)	
E) Antiprotozoa, biocides	Oct 5	Paper 8

## Exam

**Oct 10**

### III. Resistance

A) Resistance mechanisms	Oct 12	Paper 9
B) Export (MDR) pumps (no meeting, "Friday schedule")	Oct 17 Oct 19	Paper 10

### IV. Inherent Antimicrobials

A) Innate immunity (defensins)	Oct 24	Paper 12
B) Non-mammalian (attine symbiosis)	Oct 26	Paper 13

### V. Antivirals

A) Viruses overview	Oct 31 (Takemoto)	
B) Antivirals Institute @USU	Nov 2	
C) Institute Antiviral Research (visit)	Nov 7	
D) Antivirals (special lecture)	Nov 9	

### VI. Discovery

A) Overview: new discovery strategies	Nov 14 (Takemoto)	
B) Redirecting old drugs	Nov 16	Paper 14
C) Natural products discovery (no meeting)	Nov 19 Nov 21	Paper 15
D) Synthetic biology or Phage therapy	Nov 28	Paper 17

### VII. Societal issues

A) Food security	Nov 30	Paper 18
B) Biological warfare and antimicrobials	Dec 5	
C) Topic to be decided wrap-up, review	Dec 7	

## Exam (final)

**Dec 12 (11:30am)**