

Forensic Biology 444L- Spring 2001

SE '01
Pru

Serology Instructor: Cathy Matsuoka, 529-3702

DNA Instructor: Barrie Chua-Chiaco, 529-3517

Weekly Schedule:

April 3 Tuesday Week 1 Serology	<ul style="list-style-type: none">• Review syllabus• Safety Training/Quiz• Review paper• Assignment: Bring in 3 swabs of known origin for Phenolphthalein/Takayama testing due 4/10• Paper 1 due 4/10
April 5 Thursday Week 1 Serology	<ul style="list-style-type: none">• No class
April 10 Tuesday Week 2 Serology	<ul style="list-style-type: none">• Lecture: Presumptive and Confirmatory Tests, Phenolphthalein, Review Paper 1• Lab: Phenolphthalein- experiment series• Lab: Phenolphthalein of 3 swabs• Paper 2 due 4/12
April 12 Thursday Week 2 Serology	<ul style="list-style-type: none">• Lecture: Takayama, Review Paper 2• Takayama of 3 swabs• Assignment: Phenolphthalein/Takayama Worksheet due on 4/17
April 17 Tuesday Week 3 Serology	<ul style="list-style-type: none">• Lecture: Antibody/Antigen, Origin gels• Use of pipettors• Lab: Begin Origin Gel Experiment
April 19 Thursday Week 3 Serology	<ul style="list-style-type: none">• Lecture: ABO Blood Typing• Review Origin Gel Results• Demonstration: ABO Blood determination• Assignment: ABO Worksheet due on 4/26• Assignment: Origin Gel Worksheet due on 4/24
April 24 Tuesday Week 4 Serology	<ul style="list-style-type: none">• Lecture: Handling of Evidence, Case notes• Distribute and begin analysis of Serology Mock case samples (phenolphthalein, Takayama, origin gels)

Forensic Biology 444L- Spring 2001

<p>April 26 Thursday</p> <p>Week 4 Serology</p>	<ul style="list-style-type: none"> • Lecture: Identification vs. Individualization, Report Writing • Complete Serology testing • Assignment: Serology Mock Case Results due on 5/1
<p>May 1 Tuesday</p> <p>Week 5 Serology</p>	<ul style="list-style-type: none"> • Lecture: AbaCard Test for Heme • Lab: AbaCard Test for Heme • Paper 3 due 5/3
<p>May 3 Thursday</p> <p>Week 5 Serology</p>	<ul style="list-style-type: none"> • Lecture: DNA basics, VNTRs. Extraction, Contamination • Distribute and begin analysis of DNA Mock case samples (D1S80) • Lab: Chelex Extraction of DNA unknowns • Paper 4 due 5/8
<p>May 8 Tuesday</p> <p>Week 6 DNA</p>	<ul style="list-style-type: none"> • Lecture: Amplification • Lab: D1S80 Amplification • Paper 5 due 5/10
<p>May 10 Thursday</p> <p>Week 6 DNA</p>	<ul style="list-style-type: none"> • Lecture: Product Gels • Lab: D1S80 Product Gels • Assignment: DNA Worksheet due 5/15
<p>May 15 Tuesday</p> <p>Week 7 DNA</p>	<ul style="list-style-type: none"> • Lecture: Statistical Calculations. Report Writing • Assignment: DNA Mock Case Results due 5/22
<p>May 17 Thursday</p> <p>Week 7 DNA</p>	<ul style="list-style-type: none"> • Lecture: PM+DQA, STR's
<p>May 22 Tuesday</p> <p>Week 8 Legal Issues</p>	<ul style="list-style-type: none"> • DNA Mock Case Results due • Lecture: Legal Issues, Frye/Daubert, Courtroom procedure, KISS principle • Mock Court Role Assignment

Forensic Biology 444L- Spring 2001

May 24 Thursday Week 8 Mock Court	<ul style="list-style-type: none">• Mock Court Prep
May 29 Tuesday Week 9 Mock Court	<ul style="list-style-type: none">• Mock Court- Serology• Mock Court-DNA
May 31 Thursday Week 9 Review	<ul style="list-style-type: none">• Review results of mock court• Review for final
June 5 Tuesday Week 10 FINAL	<ul style="list-style-type: none">• Laboratory Final Exam
June 7 Thursday	<ul style="list-style-type: none">• No class

Forensic Biology 444L- Spring 2001

Point Breakdown:

25	5 papers, 5 points each
10	Blood Presumptive/Confirmatory Experiment
5	Origin Gel Experiment
5	ABO Blood Worksheet
15	Serology Mock Case
5	DNA Worksheet
15	DNA Mock Case
20	Mock Court
100	Mock Court

Paper Assignments:

1. Cox, M., "A Study of the Sensitivity and Specificity of Four Presumptive Tests for Blood," JFS, 36(5), Sept. 1991, pp. 1503-1511.
2. Hatch, A.L., "A Modified Reagent for the Confirmation of Blood," JFS, 38(6), Nov. 1993, pp. 1502-1506.
3. Walsh, P.S., Metzger, D.A., Higuchi, R., "Chelex 100 as a Medium for PCR-based Typing from Forensic Material," BioTechniques, 10(4), 1991, pp. 506-513.
4. Saiki, R., Gelfund, D.H., Stoffel, S. et al., "Primer-Directed Enzymatic Amplification of DNA with a Thermostable DNA Polymerase," Science, v. 239, Jan. 1988, pp.487-491.
5. Applied Biosystems, AmpliFLP D1580 PCR Amplification Kit (Product Insert), 2000, p. 1-20.

Rules of the Laboratory:

1. Students will not be allowed to participate in lab activities until they pass a laboratory safety quiz (no points). A perfect score is required.
2. Attendance is mandatory. There are no make-up labs. If a student does miss a lab they may use another individual's data (with prior consent of the instructor) but they may receive only half the points at maximum on the write-up.
3. No late papers or reports will be accepted. Assignments are due at the start of the designated lab session.
4. There is NO make-up of the final exam.
5. The instructors reserve the right to suspend any student for the laboratory period if they do not follow the below rules. The student will lose 5 points for the day. There will be no make-ups for work missed on that day.
 - Students shall be respectful to their peers and to the instructor. Derogatory, racial, or sexist comments will not be tolerated.
 - Horseplay in the lab jeopardizes the safety of the individuals involved and the other students in the lab. Such behavior is forbidden.

Forensic Biology 444L- Spring 2001

Safety:

1. The wearing of a laboratory coat is mandatory when working in the lab. It is recommended that the coats be full length and white in color. These coats and their laundering are provided for you. Laboratory coats are to be removed each time you leave the laboratory.
2. Covered shoes must be worn in the laboratory. Slippers or open sandals are not allowed.
3. The wearing of appropriate gloves is mandatory when working with samples or chemicals. If handling biologicals (blood, semen, etc.) the use of eye protection with side shields is also mandatory.
4. All body fluids and body fluid stains are to be treated as if they are infectious. Never assume any body fluid is not infectious regardless of the source.
5. Wash hands frequently when handling samples or chemicals. Even though gloves are worn, hands should be washed often with disinfectant soap, especially before eating, smoking, etc. Hands are always to be washed before leaving the laboratory.
6. Each time a sample is removed from its container and examined on the benchtop, the possibility of benchtop contamination exists. Therefore, the benchtops are to be cleaned before and after use (10% bleach for biologicals.) Do not use bleach for disinfection of the hands, clothing or skin. Biological or chemical spills should be cleaned immediately.
7. Smoking, eating, drinking, or the application of make-up is prohibited in the laboratory. You should not place personal belongings on the benchtop while working. Remember to keep hands, pencils, pens, and instruments away from your face at all times.
8. Protective eye covers for UV lamp and laser work, as well as face shields and safety goggles for tasks that could potentially cause foreign objects to strike the eyes are provided. They should be used as appropriate. Safety glasses are to be worn in the laboratory at all times.
9. Chipped, broken, and contaminated glassware is to be disposed of in the broken glass containers only. These containers are not to be re-used under any circumstances.
10. Report all accidents, however minor, to the instructor immediately. This includes any spills of caustics, volatile or caustic chemicals, and body fluids.

Forensic Biology 444L- Spring 2001

Hazards of the Laboratory:

All chemicals used in the laboratory offer a degree of safety risk. Care should be taken when handling any chemical. Chemical spills should be reported immediately to the instructor. If there are any questions about the hazards of any chemical refer to the MSDS.

1. Ethidium bromide- this substance may alter genetic material (mutagen).

All microorganisms, whether bacteria, fungi, or viruses, found in human blood, semen, saliva, urine, vaginal secretions, tears, tissue, or fecal matter, should be considered potentially infectious and pathogenic. Fortunately, for laboratory personnel, the mode of transmission of these microorganisms, for the most part, requires direct introduction into the blood stream such as accidental inoculation with needles or other sharp objects such as scalpels. There are however some microorganisms that can infect laboratory personnel by droplets and aerosols. This summary is by no means inclusive of all potentially dangerous microorganisms.

1. AIDS- This fatal disease is caused by the HTLV-III (Human T-cell lymphotropic virus) also known as HIV (Human immunodeficiency virus). The AIDS virus incorporates its viral genome into the host's DNA of the T-lymphocyte cells. This infection then causes the production of more viruses and the destruction of the immune system, eventually causing death. THERE IS NO CURE FOR AIDS AND IT IS ALWAYS FATAL.

Infection with the virus has been shown to occur primarily by two means: sexual intercourse and parenteral (injection by needle). It has been reported that the AIDS virus can survive outside the human body for as long as 15 days in a moist environment (i.e. liquid blood or semen). The survivability of the virus in dried stains of blood/semen/saliva, has not yet been determined, however, it can survive for several days. The risk of infection following a needle-stick with blood from a known HIV-positive patient is less than 0.5%. The risk of exposure of mucous membranes or intact skin is considerably less. Thus, proper laboratory practices and universal precautions allow the safe handling of HIV contaminated blood.

Forensic Biology 444L- Spring 2001

2. Hepatitis B- In a laboratory setting, the Hepatitis B virus poses the greatest risk to the laboratory worker. Approximately 1/4 billion people are potentially infected with the virus meaning that the risk of processing infectious blood in the laboratory is high. Non-vaccinated individuals have a 6-30% chance of contracting Hepatitis B if they receive a needle-stick from infected blood.

The Hepatitis B virus may be present in blood, urine, semen, vaginal secretions, and saliva. Parenteral inoculation, droplet exposure of mucous membranes, and contact exposure of broken skin are the primary laboratory hazards. The virus may be stable in dried blood or blood components for several days and is extremely stable, resisting heating, drying, and most chemicals. An active case (~10% of the infected population) of the disease can result in jaundice, cirrhosis, and even cancer of the liver. **THERE IS NO CURE FOR HEPATITIS B.** There is a vaccine available that offers long-term immunity. See your health care provider for details.