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FD 99 Pny

**FORENSIC BIOLOGY 444
COURSE SCHEDULE**

FORENSIC SEROLOGY: OCTOBER 5, 1999 TO NOVEMBER 4, 1999
DNA : NOVEMBER 9, 1999 TO DECEMBER 8, 1999

FORENSIC SEROLOGY LECTURE:

1. Introduction
Basic Immunology
 - a. Cellular Immune Apparatus
 - b. Antigens
 - c. Antibodies
 - d. Primary and secundar response

2. Basic Genetics
 - a. Mendelian Genetics
Mendels' First and Second Laws of Inheritance
 - b. Probability
Product and Sum rules

3. Forensic Serology
 - a. History
 - b. Characteristics of Liquid Blood
 - c. ABO Typing of Liquid Blood
Other Blood Systems
 - d. Typing of Blood Stains

4. Other Bodily Fluids

DNA LECTURE:

5. DNA Structure and Chemistry
 - a. Replication, Transcription and Translation
 - b. Mitochondrial DNA
 - c. Genetics

6. DNA Recovery
 - a. Quantification
 - b. Restriction Enzymes
 - c. Electrophoresis of DNA

7. DNA Detection (RFLP)
 - a. Southern Blotting
 - b. Autoradiography

8. **DNA Detection (PCR)**
 - a. **PCR Amplification**
 - b. **Reverse Dot Blots, STR's**

9. **Population Genetics**
 - a. **Harvey-Weinberg Equilibrium**

Laboratory Syllabus

Handouts to include the following:

- FBI protocols
1. Prep. And Use of Phenolphthalein Presump. Reagent test (p2-3)
 2. Prep. And Use of Luminol Presump. Reagent test (p2-5)
 3. Prep. And Use of Takayama Confirmatory test (p2-10)
 4. ABO Typing of Liquid Blood (p4-3)
 5. ABO Absorbion Elution Procedure (p5-3)

- Articles:
1. Chemiluminescence in the Visualization of Forensic Bloodstains; Lytle & Hedgecock; JFS Dec'97, p550-562
 2. A study of the Sensitivity and Specificity of four Presumptive tests for blood, Cox; JFS vol 36, sept 91, p1503-1511
 3. A modified reagent for the confirmation of blood, Hatch, JFS vol 38, Nov. 93, p1502-1506.
 4. A Microplate Method for Reverse ABO Typing of Bloodstains; Mudd, JL, JFS, vol 31, April 86, p418-425.

Topics:

- I Is it blood? (Week of 10-17 & 24-99)
1. General Laboratory safety - (lab safety handout & Universal precautions safety video)
 2. Unknown case sample
 3. Presumptive test for blood
 - a) phenolphthalein test/luminol
 - b) false positives
 - c) detection levels
 4. Confirmatory test for blood
 - a) Takayama test
- II Is it Human? (Week of 10-24 & 31-99)
5. Ouchterlony Origin determination
 - a) passive diffusion (overnight)
 - b) staining/interpretation
- III Whose is it? (Week of 10-31 & 11-07-99)
6. ABO blood typing
 - a) forward/reverse liquid blood typing
 - b) forward/revers stains
- IV Is there something better? (Week of 11-07 & 14-99)
7. DNA typing - PCR
 - a) chelex extraction of cheek cells
 - b) PCR amplification D1S80 kits
 - c) visualization by agarose gel and EtBr. (demo 11 lane PAGE of extraction?)
- V Lab Quiz (12-07-99) - 50 points
- VI UNKNOWN sample results (due 12-14-99) - 50 points