

Molecular Medicine-Syllabus

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Week 1- Introduction

First Class

Overview of the course/bureaucratic issues

Determine lab groups

Check out of equipment to students

Safety lecture

Second Class

Lecture: Animal Care

Biohazard

Tissue Culture

Week 2- The bone marrow

First Class

Lecture: Lymphocyte biology

Remove bone marrow

Isolate lymphocyte populations from the bone marrow

Characterization of the bone marrow population

Second Class

Lecture: The innate and adaptive immune system

Characterization of the peripheral lymphoid compartments

Week 3- The T cell lineage

First Class

Lecture: T cell development

Prepare thymocyte populations for analysis by flow cytometry

Second Class

Lecture: B cell development

Flow cytometric analysis of lymphoid populations

Week 4- Lymphocytes in aged and immunodeficient mice

First Class

Lecture: Stem cells

Analysis of aged and immunodeficient thymocytes

Second Class

Lecture: Immunodeficient murine models

Flow cytometric analysis of aged and immuno-deficient lymphoid populations

Week 5- Genomic stability and thymocyte survival**First Class**

Lecture: Molecular mechanisms that underpin lymphocyte survival

Thymocyte survival upon exposure to ultraviolet radiation

Second Class

Analysis of survival versus cell death

Week 6- Introduction to Molecular Biology**First Class**

Lecture: Introduction to molecular biology techniques

Making competent bacteria

Second Class

Lecture: Bacterial transformation

Transformation of retroviral construct

Week 7- Preparation of DNA for transfection**First Class**

Lecture: The biology of retro- and lentiviruses

Large-scale retroviral construct preparation

Second Class

Lecture: Chromosomal and plasmid DNA

Isolation of plasmid DNA

Week 8- Characterization of retroviral DNA**First Class**

Lecture: Gene transfer

Characterization of retroviral DNA by restriction enzyme digestion

Second Class

Lecture: Introduction to tissue culture

Prepare cells for transfection

Week 9- Transfection of DNA encoding tumor suppressors into embryonic kidney cells**First Class**

Lecture: Proto-oncogenes and tumor suppressors

Transfection of tumor suppressors into embryonic kidney cells

Second Class

Lecture: Role of tumor suppressors and developmental progression
Harvest retroviral preparations.

Week 10- Analysis of lymphomas infected by retroviruses- Gene Therapy**First Class**

Lecture: Tumor biology
Infect T cell lymphomas with retroviral supernatant.

Second Class

Lecture: Leukemias and lymphomas
Analysis of lymphomas transduced with retrovirus
Final quiz