

2007 ERHS 611 OUTLINE

Description: The course will cover the role of genetic background in determining individual susceptibility to cancer. There will be a brief introduction to cancer biology followed lectures on cancer syndromes and gene-environment interactions. Somatic and constitutional mutations and sequence variants in selected adult onset cancers will also be covered. Throughout the course examples of the use of animal models for genetic dissection of cancer susceptibility will be presented. The course will be taught as didactic lectures on each topic followed by a review of historic and current literature on that topic.

Student Learning Objectives: The emphasis will be on understanding the experimental methodology that has been used to acquire our current understanding of cancer genetics. Students will be able to describe experimental approaches used by others to detect heritability to a particular cancer, map and identify the relevant genes, and search for associated mutations and polymorphisms. They will also be able to combine elements of these approaches to design their own experiments.

Textbook or Reading Materials: Genetic Predisposition to Cancer by Rosalind A. Eeles, Douglas F. Easton, Bruce A. J. Ponder, and Charis Eng is recommended as a supplemental source. Research and review articles will be selected by the instructor.

Topics and Schedule:

Date	Class #	Topic
Aug 21 Tu	1	Introduction
Aug 23 Th	2	Review of transformation, oncogenes
Aug 28 Tu	3	Review of tumor suppressor genes
Aug 30 Th	4	Retinoblastoma
Sept 4 Tu	5	Retinoblastoma
Sept 6 Th	6	Retinoblastoma
Sept 11 Tu	7	Imprinting and Wilms tumor
Sept 13 Th	8	Imprinting and Wilms tumor
Sept 18 Tu	9	Xeroderma Pigmentosum
Sept 20 Th	10	Xeroderma Pigmentosum
Sept 25 Tu	11	Ataxia-telangiectasia
Sept 27 Th	12	Ataxia-telangiectasia
Oct 2 Tu	13	Familial Adenomatous Polyposis
Oct 4 Th	14	Hereditary Nonpolyposis Colorectal Cancer
Oct 9 Tu	15	Mid-Term Exam
Oct 11 Th	16	Li Fraumani Syndrome
Oct 16 Tu	17	breast and ovarian
Oct 18 Th	18	<i>Hess/Ptitsyn</i> array analysis
Oct 23 Tu	19	<i>Hess/Ptitsyn</i> array analysis
Oct 25 Th	20	<i>Hess/Ptitsyn</i> array analysis
Oct 30 Tu	21	Breast and ovarian
Nov 1 Th	22	Quantitative traits/Twin studies
Nov 6 Tu	23	Veterinary tumors
Nov 8 Th	24	Animal models strain susceptibility differences, metastasis
Nov 13 Tu	25	Animal models - transgenics, knock-ins, knockouts and

		conditional knockouts (ENU and retroviral mutagenesis)
Nov 15 Th	26	Hunting low penetrance genes and modifier genes Association studies/genome-wide SNP bashing
Nov 27 Tu	27	<i>Legare</i> Environmental Toxins and Cancer
Nov 29 Th	28	walk
Dec 4 Tu	29	Gene-environment interactions - polymorphisms in genes influencing behavior, infection resistance, DNA repair and detoxification enzyme genes
Dec 6 Th	30	<i>Castellano</i> Genetic Counseling
Dec 11		Final Exam, 8:00 to 10:00 p.m.

Evaluation Methods:

Class participation – 10% Students will be expected to participate in classroom discussions of assigned papers.

Mid-term examination – 45%

Final examination - 45%

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