

CYTOSKELETON SIGNALING AND CANCER
ADVANCED READINGS IN BIOLOGY (3 hours)
Course: BIOL 6990; Section: 033 (CRN 47962)
Course: BIOL 8990; Section: 033 (CRN 47963)

Instructor:
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Class meeting times

Fridays 10:00 AM-1:00 PM in WO 3246.

Course Description

This course will cover new research into the contribution of the actin and microtubular cytoskeletons to the cell biology of cancer. We will cover recent studies on the role of cytoskeleton in cancer cells because the actin and microtubule cytoskeletons – key players underpinning many of the cellular process relevant to cancer. In the cell cycle, these two cytoskeletal structures drive chromosomal separation and cell division. During morphogenesis, they determine cell shape and polarity, and promote stable cell-cell and cell-matrix adhesion through their interaction with cadherins and integrins. Finally, during cell migration they generate protrusive forces at the front and retraction forces at the rear. We will discuss these aspects of cell behavior that often go awry in cancer.

Format

This is a literature review course in which students will present the majority of papers followed by a question/answer period. One paper will be discussed each week and these papers will be assigned by me. If a students wishes to present a different paper they may do so with my studies. The first few sessions will involve an introduction to the field and presentation of a paper.

Student Evaluation pass/fail

A passing grade will require acceptable performance in each of the following areas: Class attendance, participation in paper discussion, and oral presentation of at least one paper from the primary literature. Attendance at all classes is mandatory. In an extreme situation requiring absence from class, an effort should be made to inform the instructor in advance. Students will be actively encouraged to participate in the question/answer period. In reading and presenting a paper the following should be evaluated by the student: overall impact, experimental design, quality of data, and whether the conclusions are justified by the data.

Office Hours

The instructor is available by appointment or can answer questions by email almost any time.

Schedule

Each session will cover one paper that bears on the topics shown below

Sep 5	Introduction
Sep 12	The cytoskeleton - review
Sep 19	Role of PAK1 in centrosomal kinase Aurora A regulation
Sep 26	Regulation of cell cycle by kinetochore proteins
Oct 3	Regulation of cell-cycle, p53 activation and actin organization by septins
Oct 10	Tubulin, Taxol and Tumors
Oct 17	Role of nuclear actin in gene expression
Oct 24	TBA
Oct 31	Role of PAK1 in breast cancer cell survival and malignant progression
Nov 7	TBA
Nov 14	TBA
Nov 21	TBA
Nov 28	Thanksgiving
Dec 5	Role of chromosomal passenger proteins in mitosis
Dec 12	Integrin signaling in cancer progression