

Course Title: Radiobiology
Course: 5207
Room: MSTeams
Schedule: Tuesday and Thursday 5:30-7:00 pm

Instructors:

Dr. Ruth Wilkins
Cell: 613-355-6028
Ruth.Wilkins@canada.ca

Dr. Gosia Niedbala
Cell: (613) 292-3884
gniedbala@toh.ca

Outline:

Week of Jan 11th: Basic concepts, types of radiation (ionizing/non ionizing etc) physics and chemistry of radiation absorption (RW)

Week of Jan 17th: Cell biology, DNA replication, RNA, molecular mechanisms of DNA damage and repair (RW)

Week of Jan 24th: Chromosome biology, damage and repair, methods for biological dosimetry, intro to LQ model. (RW)

Week of Feb 1st: Classical methods of radiobiology, cell survival curves and models, molecular mechanisms of cell death, morphology of cell death (RW)
Radiation Protection Bureau with lab tour.
Assignment #1 due

Week of Feb 8th: Repair at the cellular level (SLDR, PLDR, dose rate effects, fractionation), non-targeted effects, methods for measuring radiation damage, Predictive assay (RW)

Week of Feb 22nd: RBE and LET, OER, reoxygenation, alternate treatment, brachytherapy. (GN)

Week of March 1st: Normal tissue effects (early and chronic), carcinogenesis, radiation cardiovascular effects, cataracts, heritable effects, embryo and fetal effects, ARS (RW)
Assignment #2 due

Week of March 8th: Tumor biology, structure, physiology, solid tumor assay systems, growth fraction, cell loss, growth kinetics, morphological changes, hypoxia. tumor sensitivity predictive assays (RW)

Week of March 15th, Seminar week

Week of Mar 22nd: Time, dose and fractionation effects. (GN)

Week of March 29th: Modifiers of radiation response – Radiosensitizers, radioprotectors, hyperthermia and chemotherapy agents, therapeutic ratio, radiation carcinogenesis. (GN)
Assignment #3 due

Week of April 5th: Clinical trials, methods, QUANTEC, statistical analysis, radiation protection (GN)

Evaluation Scheme:

Seminar	20%
Assignments (3)	30% (10% each)
Final Exam	50%