

**DEPARTMENT OF RADIATION ONCOLOGY RESIDENCY PROGRAM
UNIVERSITY OF ROCHESTER**

POSSIBLE RESEARCH PROJECTS 2009-2010

FACULTY MENTOR: Ralph Brasacchio MD

- Post-prostatectomy radiation: adjuvant vs. salvage radiotherapy: retrospectively review experience/results/side effects of post-operative radiotherapy.
- Brachytherapy: retrospective review of >400 patients treated with brachytherapy (+/- EBRT) for prostate cancer: disease control and side effects.

FACULTY MENTOR: Yuhchyan Chen MD PhD

- Radiation genotoxicity marker study (bench top research): Residents will observe animal radiation, tissue culture irradiation, culture lymphocytes, score lymphocyte based micronucleus analysis.
- Review of treatment outcome of Pancoast tumor at U of Rochester in the past 20 years.
- Tumor response kinetics after chemoradiation for lung cancer.

FACULTY MENTOR: Louis Constine MD

Hodgkin's disease.

- Do "E" lesions connote stage IV disease? Study outcomes of patients and poll medical oncologists, pediatric oncologists, and radiation oncologists internationally on case scenarios we devise and ask them to vote as to whether the patient is IIE or IV.
- Second malignant tumors in children: GI cancers.
- Second malignant tumors in children: Thyroid.
- Is there a radiation dose-response relationship for local control of bulk (mediastinal and non-mediastinal) disease?

Non-Hodgkin's lymphoma:

- Does RT to areas of bulk disease enhance disease-free survival?
- RT only for patients with Stage I/II indolent cell NHL.
- What are the sites of recurrence in patients who present with extranodal lymphoma?

Bone marrow transplantation:

- How does pneumonitis fit into the constellation of post-BMT sequelae? How does this relate to GVH, veno-occlusive disease of the liver, and cardiac or renal impairment?

Sarcoma:

- What other sites of metastasis (bone, liver) have been seen in our sarcoma population? Study timing of appearance (whether before or after pulmonary metastasis), and relationship to sarcoma histology.

- What is the relationship of necrosis in the resected sarcoma to local control and metastatic disease in patients treated with pre-operative RT?

Late Effects:

- Essentially all exposed organ systems are at risk for adverse effects of radiation therapy, and can be considered in the context of the specific disease or across different diseases but by the exposed organ.

FACULTY MENTOR: Bruce Fenton PhD

- Preclinical testing of novel antiangiogenic strategies using murine tumor models
- Antiangiogenic and radiotherapy treatment monitoring using MRI in animal models
- Pathophysiological effects of antiangiogenic agents on tumor vascular structure and hypoxia, as evaluated using immunohistochemistry and image analysis

FACULTY MENTOR: Alan Katz MD MPH

- Review and update of patients with liver metastases treated with stereotactic body radiation therapy
- Review of metastatic breast cancer patients treated with stereotactic body radiation therapy
- Review of esophageal cancer patients treated with concurrent chemoradiation therapy over the last 5 years

FACULTY MENTOR: Peter Keng PhD

- G2M checkpoints and radiation sensitivity.
- Role of Actin skeletal structures in radiation sensitivity.

FACULTY MENTOR: Marilyn Ling MD

- Retrospective review of post-mastectomy cases at the U of R, with or without reconstruction. Determination of locoregional recurrence, survival, impact on reconstruction.

FACULTY MENTOR: Bingren Liu MD

- Evaluate the risk of pelvic lymph node metastasis in uterine cancer. Since we need to work on different stages and histology types, this could be end up several publications. There is no chart review as all data are from SEER database and we have a expert to help us.

FACULTY MENTOR: Michael T Milano MD PhD

- Retrospective review of patients undergoing SRS for trigeminal neuralgia with Novalis.
- Retrospective review of patients undergoing SRS for AVM with Novalis.
- Retrospective review of patients with thoracic lesions from NSCLC undergoing re-irradiation with SBRT.
- Retrospective review of patients with central thoracic lesions undergoing SBRT.

FACULTY MENTOR: Karen Mustian PhD

- Exercise interventions to reduce fatigue and other side effects among cancer patients (several separate studies in breast cancer, prostate cancer, metastatic disease and lymphoma).
- NCI Breast Cancer Study: Efficacy of a home-based exercise program in relieving cancer-related fatigue among breast cancer patients receiving radiation therapy.
- DOD Prostate Cancer Study: Efficacy of a home-based exercise program in relieving cancer-related fatigue among prostate cancer patients receiving radiation therapy.
- Polarity Therapy to reduce fatigue and other side effects among cancer patients. This study also assesses cytokines and salivary cortisol.
- Mitochondrial study: Comparing mitochondrial gene expression profiles in skeletal muscle of prostate cancer patients receiving radiation therapy versus prostate cancer patients receiving radiation therapy plus an exercise intervention. Also looks at whether the mitochondrial gene expression profiles correlate with changes in fatigue levels.

FACULTY MENTOR: Walter O'Dell PhD

- Oligometastases: Study the rate of development of later metastases in subjects treated early on for initial sign of metastases.
- Efficacy of drugs used to moderate radiation damage to healthy lung tissue following SRT to the lung. Do preliminary intervention using simple moderating agents, such as curcumin and celebrex, that are already approved for human use.
- Extracranial radiosurgery application to the pancreas? Study patients with metastases to the pancreas.
- Lung nodule detection and sizing. We need assistance in sizing and estimation of nodule growth and likelihood for malignancy on both real patient data sets and in realistic simulated nodules.

FACULTY MENTOR: Paul Okunieff MD

- Metastatic patterns of failure for spine metastases.
- Follow-up on brain tumor cytokine fatigue/anorexia study.
- Develop radiation biodosimetry clinical studies.
- Tumor autoimmunity research.
- Clinical skin radioprotection studies.

FACULTY MENTOR: Joseph Roscoe PhD

- Interventions to treat insomnia.
- The role of expectations in nausea development and the use of placebos and expectations in treating it.
- Cognitive functioning problems secondary to chemotherapy.
- Prevalence, predictors, and treatments for fatigue in patients receiving radiation or chemotherapy.
- Polarity Therapy to reduce fatigue.

FACULTY MENTOR: Philip Rubin MD

- 3-D oncologic imaging – emphasis on volumetrics of organs and neoplasms.
- Clinical radiation late effect scales with application to head and neck sites.

FACULTY MENTOR: Steven Swarts PhD

- Novel assays as radiation dosimeter
- Pharmacokinetic analysis for novel anti-radiation agents

FACULTY MENTOR: Sadasivan Vidyasagar MD PhD

- Electrolyte and nutrient transport in small and large intestine
- Functional alterations in gastrointestinal transport physiology
- Epithelial barrier function in gut and skin
- Intestinal stem cell biology
- Nanoparticle transcytosis across epithelium
- Mitigating agents for acute gastrointestinal radiation syndrom

FACULTY MENTOR: Jacqueline Williams PhD

- Radiation-induced cytokines during cancer radiotherapy.
- Interactions between inflammatory cells and cytokines in response to chemotherapy/radiation therapy and their role in late effect induction.
- Is there a differential in patient response to radiation re their cytokine/inflammatory responses?
- Can we use the first 1 or 2 fractions of radiation therapy as a model for the low doses that may be received as part of a terrorist attack?

FACULTY MENTOR: Hong Zhang MD PhD

- Retrospective review of outcome of head and neck sarcoma using SEER database.
- Retrospective review of T3N0 laryngeal cancer outcomes using various treatment options.
- Treatment effect on taste in head and neck patients.

FACULTY MENTOR: Lurong Zhang MD PhD

- Novel anti-cancer agents.
- Novel radioprotectants.
- Novel anti-angiogenesis agents.
- Novel anti-inflammation agents.
- The therapeutic effect of combination of novel anti-cancer agents with radiation.
- Apoptosis and radiation.