

RCP Basic Science Priorities

LIVER

- Mechanistic based hypothesis driven optimization and systemic characterization of devices alone and in combination with adjuvants
- Study new imaging criteria for tumor response other than RECIST
- Study different non-imaging methods of measuring tumor response
- Further basic science or early clinical trial evaluation of 3BromoPyruvate
- Tissue and serum banking of tumors
- Preclinical development and evaluation of nanosystems and nanoparticle systems particularly for radiotherapy delivery

UFE

- Evaluate degree of uterine ischemia after embolization, either using imaging methods or in patients undergoing subsequent hysterectomy.
- Objectively evaluate flow characteristics during fibroid embolization as a determination of treatment endpoint. Correlate gross angiographic findings with outcomes and complications.
- Evaluate vascular receptor profile of fibroid vascular bed with an attempt to optimize target delivery.
- Develop better animal model of fibroids, with bimodal vascular bed. Existing sheep and other models are not fibroid models. Create practical animal models either with fibroids or fibroid inducible.
- Study methods of preferential catheter directed delivery of drug or embolic to fibroid and not to normal uterus or other pelvic structures.
- Develop biological signatures of fibroids that may be used as imaging markers.
- Study genetics and outcomes - genetic susceptibility by racial background with regard to therapeutic outcomes.
- Further compare results with different embolic agents.
- Look at extracellular matrix biology.
- Study genetics of fibroids and potential for intra-arterial gene therapy.
- Use sheep model to evaluate uterine perfusion and oxygenation after UAE and effect on fertility.
- Characterize molecular basis of therapeutic response to UAE, including cytokine and serum marker analysis.
- Study MR spectroscopy in patients undergoing hysterectomy.
- Develop molecular imaging agents for biologically active fibroids, i.e. PET agents.

LUNG ONCOLOGY

- Systematic characterization and optimization of devices
- Thermal dosimetry profiles for devices alone and with coupled/adjuvant therapies
- Image monitoring and endpoints determinations
- Comparison of imaging follow-up in animal models including utilization of novel imaging techniques
- Comparison of ablative methods animal study
- Proteomics and genomics of tumor response to treatment
- Development of temperature sensing / heat load sensing / tissue sensing ablation probes
- Immune response evaluation
- Imaging guidance
- Imaging treatment planning
- Bronchoscopic +/- catheter directed segmental lung isolation animal models to study "minimally invasive" segmental therapies
- Transcatheter therapies in animal models

VEIN

- Animal models for DVT – anatomic & physiologic changes during DVT therapy
- Artificial biosynthetic mechanical valves
- Develop methods to measure venous obstruction
- Evaluation of valve function after treatment
- Effects of thrombus age, size, location upon response to DVT therapy
- Stents: endothelial seeding, drug impregnation
- How does pathologic clot differ from hemostatic clot biochemically and in response to treatments?
- Endothelial function and vein wall morphology after surgical and endovenous treatments
- Intra-thrombus direct thrombin inhibitors
- Anti-inflammatory effects of heparin on DVT
- Permeability of clot to thrombolytic agents
- Histology of stented veins (non-dialysis model)
- Models of venous angiogenesis
- Develop clot-avid agents to reduce bleeding
- Etiology of venous disease
- Develop objective criteria for relevance of anatomic disease