Note From The Chair

Over the past 10 years, Duke Radiation Oncology has undergone many changes. At Duke Medical Center, we are now caring for our patients in the new Cancer Center as well as the Morris Building. In North Carolina and Virginia, care is provided at eight hospital-based community departments and the Durham Veteran’s Administration Medical Center. Our faculty has increased to include 26 physicians, five scientists engaged in basic and translational research, and 27 physicists.

In addition, our residency program has grown to 12 residents per year with rotations at Duke and the Durham VA Medical Center. Since 1983, 68 residents have graduated from our training program and have gone on to distinguished careers as faculty, chairs of departments, leaders of the American Society for Radiation Oncology (ASTRO), and practitioners. As an important element of their training, the residents spend a dedicated year of scholarly activity ranging from basic science investigation to global oncology. Our residents have been successful in receiving funded grants to help support their research. You can read about three of our residents, Yvonne Mowery (Pg 12), Adam Olson (Pg 13), and Tim Robinson (Pg 15) in this newsletter.

Our faculty contribute continuously and significantly to medical science. Their research spans from bench top to health sciences research. You can read more about their research in this newsletter too (Pgs 6, 8-11).

We hope you enjoy reading the first Radiation Oncology newsletter for you, our alumni.

Christopher Willett, MD
Professor and Chair
Physician Faculty

Christopher Willett, MD, Chair, at Duke since 2004 - GI
Rachel Blitzblau, MD, PhD, at Duke since 2010 - Breast
David Brizel, MD, at Duke since 1987 - Head/Neck
Andrew Brown, MD, at Duke since 2014. Medical Director Radiation Oncology at Scotland Cancer Treatment Center
Catherine Chang, MD, at Duke since 2010. Practice location is Raleigh as well as Duke Regional
Junzo Chino, MD, at Duke since 2010 (alumnus) - GYN. Practices at Duke Cancer Center and Raleigh
Michael Corradetti, MD, at Duke since 2016
Brian Czito, MD, at Duke since 2001 - GI
Scott Floyd, MD, PhD, at Duke since 2015 - CNS
Carol Hahn, MD, at Duke since 1995, Professor and Vice-Chair of Duke Cancer Center Wake County Radiation Oncology

Janet Horton, MD, at Duke since 2008 - Breast
Christopher Kelsey, MD, at Duke since 2007 (alumnus) - Lung
John Kirkpatrick, MD, PhD, at Duke since 2004 (alumnus) - CNS
Grace Kim, MD, PhD, at Duke since 2012 - CNS at Duke Cancer Center and Duke Regional
David Kirsch, MD, PhD, at Duke since 2007 - Sarcoma
Bridget Koontz, MD, Medical Director at Duke Regional Hospital at Duke since 2007 (alumnus)
Nicole Larrier, MD, at Duke since 2004 (alumnus) - Pediatrics & CNS. Practices at Duke Cancer Center and Maria Parham Hospital
W Robert Lee, MD, MS, M Ed, Program Director at Duke since 2006 - GU. Practices at Duke Cancer Center, Durham VA, Duke Regional

Beth Lindsay, MD, at Duke since 2003. Practices at Scotland Cancer Treatment Center and Danville Regional Medical Center
John Nelson, MD, at Duke since 2015 (alumnus). Medical Director at Danville Regional Medical Center Radiation Oncology
Manisha Palta, MD, at Duke since 2012 (alumnus) - GI Practices at Duke Cancer Center, Durham VA
Lewis Rosenberg, MD, at Duke since 2014
Scott Sailer, MD at Duke since 2014
Joseph Salama, MD, Chief at DVAMC at Duke since 2010. Practices at Duke Cancer Center and Durham VA
Kulbir Sidhu, MD, at Duke since 2012. Medical Director Radiation Oncology at Maria Parham Medical Center
David Yoo, MD, PhD, at Duke since 2009 (alumnus) - Head/Neck. Practices at Duke Cancer Center, Raleigh, Durham VA

Names in red are graduates of the Duke Radiation Oncology Residency Program

Manisha Palta and Junzo Chino in the Radiation Oncology clinic of the Cancer Center.
Where Are They Now?

Capt. John Nelson, MD, retired from the US Navy in mid-2015 and decided to join us here at Duke as one of our faculty members. He is our Medical Director at Danville Regional Medical Center Radiation Oncology. John graduated from our residency program in 2008. We are all glad to have John back with us.

We would like to let the alumni know where and what you are doing now. Please send your information and a picture to wanda.gentry@duke.edu.
Duke Cancer Center Wake County Radiation Oncology

Carol A. Hahn, MD

Radiation Oncology at Duke Cancer Center (DCC) Wake County underwent major expansion in November 2014 and now has clinics in three locations: DCC Raleigh on the campus of Duke Raleigh Hospital, DCC Macon Pond and DCC Cary Radiation Oncology. These efforts are a portion of a major Duke initiative to expand oncology services in Wake County and have been developed along with expansions in medical and surgical oncology subspecialty services to provide disease site-specific comprehensive oncology care across Wake County. Radiation oncology physician faculty members at these sites and areas of specialization include:

Carol A. Hahn, MD, FASTRO, Professor of Radiation Oncology, Vice-Chair of DCC Wake County Radiation Oncology – Breast and GI

Lewis Rosenberg, MD, PhD, Clinical Associate – Thoracic/GI

Scott Sailer, MD, Clinical Associate - Breast

Michael Corradetti, MD, PhD, Assistant Professor – General

David Yoo, MD, PhD, Assistant Professor – Head and Neck

Catherine Chang, MD, Assistant Professor – Thoracic, General

Junzo Chino, MD, Assistant Professor – GYN

David Yoo, MD, PhD
Catherine Chang, MD
Junzo Chino, MD

Carol A. Hahn, MD
Lewis Rosenberg, MD
Scott Sailer, MD
Michael Corradetti, MD
Since the expansion of services, we have been working on major technological and facility upgrades at all sites.

In March 2015, DCC Raleigh added a state-of-the-art Varian TrueBeam Linear accelerator to provide enhanced capabilities in imaging and treatment delivery. This is a second accelerator at the Raleigh site, and in June 2016 we will begin construction to install a high definition multi-leaf collimator TrueBeam accelerator to continue growth and development of stereotactic body radiotherapy (SBRT or SABR) and stereotactic radiosurgery (SRS) programs in Wake County.

Duke Cancer Center Macon Pond initiated construction in March 2015 to allow technology upgrades. In November 2015, the center was re-opened with a second TrueBeam Linear accelerator. This machine is matched to the DCC Raleigh accelerator to facilitate integration of care across these two centers. A new 128 slice Siemens edge CT scanner has been installed at this location and is used for radiotherapy simulations for precision planning of radiotherapy treatments. The completely remodeled Medical Oncology Infusion suite at DCC Macon Pond opened in February 2016. High Dose Rate brachytherapy facilities are presently being upgraded with new technology to be available in Fall 2016.

Duke Cancer Center Cary Radiation Oncology initiated construction in November 2015 for technology upgrades. We anticipate re-opening in summer 2016 with the third TrueBeam Linear accelerator and a dedicated CT Simulator. All three linear accelerators will be matched, and planning will be performed and treatment delivered on the most recent upgrade of the Varian ARIA/Eclipse system. This, in combination with the implementation of Maestro Care—Duke’s EPIC electronic medical record system—across the three sites, will provide seamless integration of Radiation Oncology care across DCC Wake County to allow patients to receive treatment in their location of choice.

Pictured Left to right : Charles Curle, MS, DABR, Clinical Director of Physics, DCC Wake County Tim Catalano, RTT Radiation Therapist, Van Humbles, RTT, Radiation Therapist, Chris Ward, CMC, Dosimetrist
Radiation Physics Division

Under the leadership of Dr. Fang Fang Yin, the Physics Division within the Department of Radiation Oncology has grown to 34 faculty/physicists/IT managers/staff assistant: (4 professors, 7 associate professors, 7 assistant professors, 8 staff medical physicists, 5 medical physics residents, 2 IT Staff, 1 staff assistant) who are engaged in clinical, research (including basic, translational, and clinical), and educational activities on a daily basis. The Physics Division provides expertise and support to all radiation oncology clinical services. Dr. Yin and colleagues are shown in the picture below. Among the many accomplishments, a graduate program in Medical Physics, a post-graduate clinical Residency Program, and more recently a graduate program in Medical Physics at Duke Kunshan University in China have been established.

Gastrointestinal Cancer Research

Manisha Palta, MD, an assistant professor in the Department of Radiation Oncology, focuses her clinical practice on caring for patients with gastrointestinal malignancies. Her clinical research integrates novel systemic agents with advanced radiotherapy planning and treatment techniques. Currently, she is the principal investigator of a prospective, investigator-initiated study incorporating neoadjuvant gemcitabine and nab-paclitaxel followed by stereotactic body radiotherapy in patients with potentially resectable pancreatic cancer. Dr. Palta is also developing an investigator-initiated, industry-sponsored study evaluating immunotherapy in combination with standard chemoradiation in resectable esophago-gastric malignancies.
Residency Program Director
W. Robert Lee, MD, MS, MEd, FASTRO

Summary of NRG/RTOG 0415

The last several months have been busy ones for Dr. Lee. In July 2015 the NRG/RTOG Data Monitoring Committee recommended that the results of NRG/RTOG 0415 be reported. Dr. Lee presented these results at the 2015 ASTRO Plenary Session in San Antonio as well as the 2016 ASCO GU Symposium in San Francisco. The results are briefly summarized below.

NRG/RTOG 0415 is a non-inferiority trial designed to determine whether the efficacy of a hypofractionated radiotherapy schedule was no worse than a conventional schedule in men with low-risk prostate cancer. From 2006 to 2009, 1115 men with low-risk prostate cancer (clinical stage T1-2a, Gleason score ≤ 6, prostate-specific antigen level < 10) were randomly assigned 1:1 to a conventional schedule (73.8 Gy in 41 fractions over 8.2 weeks-C-RT) or to a hypofractionated schedule (70 Gy in 28 fractions over 5.6 weeks H-RT).

A total of 1092 protocol-eligible men were randomized and analyzable: (542 to C-RT and 550 to H-RT). Median follow-up was 5.9 years. Baseline characteristics did not differ according to the treatment arm. At the time of analysis, 185 disease-free survival events were observed: 99 in the C-RT arm and 86 in the H-RT arm. Estimated 5-year disease-free survival was 85.3% (81.9-88.1) in the C-RT arm and 86.3% (83.1-89.0) in the H-RT arm. The hazard ratio for disease-free survival (conventional/hypofractionated) was 0.85 (0.64, 1.14) favoring the HRT arm. Comparison of biochemical recurrence [hazard ratio = 0.77, (0.51, 1.17)] and overall survival [hazard ratio = 0.95, (0.65, 1.41)] also met protocol noninferiority criteria.

Mild side effects (Grade 2) were slightly higher in patients assigned to the hypofractionated arm but more severe Grade 3 events were no different (Late Grade 3 GI 4.1 percent (70 Gy) vs. 2.4 percent (73.8 Gy); Late Grade 3 GU 3.5 percent (70 Gy) vs 2.1 percent (73.8 Gy), respectively).

Dr Lee concludes that “the study results should make practitioners feel comfortable that the shorter radiotherapy course is as effective as a conventional course with significant advantages for patient convenience and resource utilization.” The initial manuscript will be published in JCO later this year.

Recent graduates and where they are now

- Ato Wright, 2015, Tulane Cancer Center
- Bradford Perez, 2015, H. Lee Moffitt Cancer Center
- Jason Lee, 2015, Memorial and St. Elizabeth Cancer Treatment Center, Swansea, IL
- Stephen Lewis, 2014, Department of the Navy Bethesda, MD
- Timothy Barkdoll, 2014, Department of the Navy Great Lakes, IL
- Daniel Oh, 2013, University of North Carolina, Chapel Hill
- Pretesh Patel, 2013, Emory University
- David Buser, 2012, Robert Boissoneault Oncology Institute, Ocala, FL
- Alvin Cabrera, 2012, Group Health Cooperative, Seattle, WA
- Kyle Cuneo, 2012, University of Michigan
- Jennifer Dorth, 2012, University Hospital Seidman Cancer Center, Cleveland, OH
- Manisha Palta, 2012, Duke Health System
- Joseph Pepek, 2012, Princeton Radiation Oncology
- Timothy Zagar, 2011, University of North Carolina, Chapel Hill
- Kristin Higgins, 2011, Emory University
Basic and Translational Research

David Kirsch MD, PhD, a Professor in the Departments of Radiation Oncology and Pharmacology & Cancer Biology, serves as vice chair for basic and translational research within Radiation Oncology and as leader of the Radiation Oncology and Imaging Program in the Duke Cancer Institute. Dr. Kirsch focuses his clinical practice on caring for patients with bone and soft tissue sarcomas. He chairs the Developmental Therapeutics Committee in the Sarcoma Alliance for Research through Collaboration (SARC), serves on the AJCC staging committee for soft tissue sarcomas, and is active in the NRG Sarcoma Working Group, having served as a national co-chair for RTOG 0630, a phase II clinical trial of IGRT for extremity sarcoma (Wang et al, JCO 2015). Dr. Kirsch leads a research group of scientists that includes post-docs, graduate students, MD-PhD students, medical students, residents, and undergraduate students who use next-generation genetically engineered mouse models to study radiation biology and cancer biology. Recent work from the Kirsch lab has clarified the cellular target of SBRT in primary sarcomas in mice: endothelial cells regulate growth delay after radiation (Moding et al, Journal of Clinical Investigation 2014), but tumor cells mediate local control (Moding et al, Science Translational Medicine 2015). Other studies have included dissecting mechanisms of radiation-induced gastrointestinal injury (Kirsch et al, Science 2010), cardiac injury (Lee et al, Science Signaling 2012), hematopoietic injury (Doan et al, Nature Medicine 2013) and radiation carcinogenesis (Lee et al, Nature Communications 2015). Recent work from Dr. Kirsch’s lab on novel intraoperative imaging technology to detect microscopic residual cancer was translated into a first-in human clinical trial at Duke. This clinical trial, which was carried out with key contributions from Joan Cahill and the radiation oncology clinical trial office, was recently published (Whitely et al, Science Translational Medicine 2016) and featured in the lay press.

Dr. Kirsch’s research productivity has recently been recognized by the National Cancer Institute, which awarded Dr. Kirsch an Outstanding Investigator Award R35 grant.
Breast Cancer Research

Dr. Janet Horton is an associate professor in the Department of Radiation Oncology at Duke where she is part of a highly trained and experienced multi-disciplinary breast group caring for hundreds of women with breast cancer. Her translational research interests are focused on using genomic data as a basis for studying radiation response in human breast tumors and using that information to design biologically based radiotherapy trials. In 2010, with support from leadership in the Department of Radiation Oncology and Duke University Health System, Dr. Horton and colleagues initiated a Phase I clinical trial evaluating radiotherapy delivered to the intact tumor prior to surgical resection for early stage, biologically favorable, breast cancer patients [Horton, Int J Radiation Oncol Biol Phys, 2015; Blitzblau, Pract Radiat Oncol, 2015; Yoo, J Appl Clin Med Phys, 2015]. This novel approach limits the amount of normal tissue receiving radiation dose and is widely accessible to most radiation oncology facilities without additional equipment or training. Most importantly, this technique opens the door to defining imaging and genomic markers of radiation response in early stage breast cancer through pre- and post-radiotherapy radiation response assessment [Wang, Technol Cancer Res Treat, 2015; Horton, Rad Res, 2015]. This work was facilitated by Dr. Horton’s selection in 2011 as a Build Interdisciplinary Research Careers in Women’s Health (BIRCWH) scholar through the NIH career development program. Her research is also supported by philanthropic support, a Varian Medical Systems research grant, and a Susan G. Komen Career Catalyst Award.

Building on the Phase I experience, Dr. Horton subsequently designed companion Phase II clinical trials designed to capitalize on the clinical and biological strengths of the preoperative approach. She obtained funding from the Gateway for Cancer Research to support these studies, and they opened late in 2015. The first trial evaluates the clinical biomarker of pathologically complete response in women with biologically favorable cancers receiving definitive preoperative radiation. The second trial provides a lower boost dose of preoperative radiation, to be followed by conventional radiotherapy after surgery, in women with more advanced and biologically heterogeneous disease. Pre- and post-radiotherapy assessment of gene expression in this trial is expected to enrich the Phase I data by incorporating measures of radiation response across heterogeneous breast tumors.

In addition to her research, Dr. Horton serves on the Breast and Translational Subcommittees for NRG Oncology. She recently completed a 4-year commitment as an associate editor for the nationally recognized radiation oncology journal, the International Journal of Radiation Oncology, Biology, Physics. Finally, she serves on the American Board of Radiology’s Breast Committee charged with the construction, administration and review of national certification exams for graduating residents and practicing radiation oncologists.
Mark W. Dewhirst, DVM, PhD, is the Gustavo S. Montana Professor of Radiation Oncology, Vice Director for Basic Science in the Duke Cancer Institute and Associate Dean for Faculty Mentoring in the Duke School of Medicine. Dr. Dewhirst graduated from the University of Arizona in 1971 with a degree in Chemistry and Colorado State University in 1975 and 1979 with DVM and PhD degrees, respectively.

Dr. Dewhirst has research interests in tumor hypoxia, angiogenesis, hyperthermia and drug transport. He has spent 30 years studying causes and consequences of tumor hypoxia. In collaboration with Professor David Needham in the Pratt School of Engineering, he has developed a novel thermally-sensitive drug carrying liposome that has been successfully translated to human clinical trials. Central to his successes has been his early adoption of intravital microscopy as an analytical method to study tumor physiology. Additionally, Dr. Dewhirst has long been interested in using companion animal cancers as models for human cancer. He has published over 70 papers in his career involving clinical trials with canine cancers. The recent resurgence of interest in the canine model was capped by an Institute of Medicine Symposium, followed by a formal consortium arrangement between the Duke Cancer Institute and the College of Veterinary Medicine at NC State University to further develop and utilize the canine model. Dr. Dewhirst has played a leadership role in these newest developments.

Dr. Dewhirst’s most current research interest is in the use of exercise as an adjuvant to other cancer therapies. In collaboration with Lee Jones, PhD, Director of Cardio-Oncology Research Program, Memorial Sloan Kettering Cancer Center, he has reported that exercise improves tumor perfusion and vascular maturity while reducing hypoxia (Figure on Pg 11). These effects enhance the antitumor effects of chemotherapy. He is currently evaluating how radiotherapy response is affected by this low cost and healthy intervention.

Photograph of Dr. Dewhirst with three prior mentees. Ashley van Heteren, PhD, is a junior partner for McKinsey and Company; Benjamin Viglianti, PhD, MD, is an Assistant Professor of Radiology, University of Michigan, Matthew Dreher, PhD, is technical director for Biocompatibles, Inc.
Dr. Dewhirst has well over 500 peer-reviewed publications, book chapters and reviews, with more than 25,000 citations and an H-index of 81. He has given named lectures at the University of Western Ontario, Thomas Jefferson University, University of Pennsylvania, and the New Zealand Cancer Society. He was awarded the Failla Medal and Lecture from the Radiation Research Society in 2008, the Eugene Robinson Award for Excellence Hyperthermia Research in 1992 and a similar award from the European Society for Hyperthermic Oncology in 2009. He was named a fellow of ASTRO in 2009 and was awarded the prestigious Gold Medal from the same society in 2012. Dr. Dewhirst was also named a Fellow in the AAAS for his translational work in the field of hyperthermia. He is a senior editor of Cancer Research and editor-in-chief of the International Journal of Hyperthermia.

He has mentored well over 60 graduate students, postdoctoral fellows, residents, junior faculty, and medical students. He has been particularly skillful in assisting those he has mentored to obtain Department of Defense and NIH fellowships, K awards and first R01 grants. His skill in mentoring has been recognized by the Duke Cancer Institute, the Medical Physics Graduate Training programs and the School of Medicine, where he has received “Mentor of the Year” awards. In 2011, he was appointed the first Associate Dean of Faculty Mentoring in the Duke School of Medicine. In this position, he has implemented a comprehensive program to enhance success in obtaining NIH funding. Since implementation, the program has raised success rates for first time R01 applicants to more than 25% and more than 65% for K grant applicants.

**Exercise in mice decreases breast tumor hypoxia**

![Graph showing percentage of tumor area that is hypoxic](image)

*Betof et al, JNCI 2015*
The opportunity to dedicate a full year to scholarly activity during residency has allowed me to initiate a new basic and translational research project in the laboratory of Dr. David Kirsch. With funding support from the RSNA Resident/Fellow Grant and SARC Developmental Research Program Grant, we are investigating the combination of immune checkpoint blockade with radiotherapy for soft tissue sarcomas. Several preclinical studies using transplanted tumor models have shown promising results when immune checkpoint inhibitors such as anti-PD-1 and anti-CTLA-4 antibodies are combined with radiotherapy, however research with primary tumor models is limited. We are utilizing genetically-engineered and carcinogen-induced primary mouse models of soft tissue sarcoma of the extremity to dissect the impact of tumor mutational load on immune checkpoint inhibitor response. We are also characterizing immune response to immune checkpoint blockade with concurrent radiotherapy to optimize this therapeutic approach and to identify predictors of clinical response. In parallel with these preclinical studies, we are initiating a multi-institutional prospective clinical trial to assess whether neoadjuvant radiotherapy with concurrent pembrolizumab improves metastasis-free survival for high-risk, localized soft tissue sarcoma of the extremity.

In addition to my laboratory work with immunotherapy and radiation treatment, I am engaged in several other research projects this year. These include working to develop primary mouse models of HPV-positive and HPV-negative head and neck cancer and collaborating with Dr. David Brizel to investigate the prognostic value of intra-treatment \(^{18}\)F-FDG PET/CT for patients undergoing definitive (chemo)radiation for head and neck cancer. Ongoing retrospective analyses include examination of U.S. patterns of care for breast cancer radiotherapy, assessment of long-term outcomes after radiotherapy for meningiomas, and analysis of toxicity and clinical outcomes with combined anti-PD-1 therapy and radiation treatment for melanoma and lung cancer. Finally, I am using my PGY-4 year to complete a GME Concentration in Patient Safety and Quality Improvement. This program entails additional coursework, TeamSTEPPS training, involvement in the Patient Safety and Quality Council, and presentation of an independent quality improvement project.
Resident Research in Global Health
By Adam Olson, MD

During residency I rekindled my long-dormant interest in global health. I joined the ARRO global health subcommittee, the ABS International subcommittee, and I successfully applied to the Duke Global Health Residency Pathway. This is a Master’s of Science program combining one year of didactics and nine months of field-based research. I am the first radiation oncology resident to obtain this training at Duke. I will complete the coursework during my PGY-4 year and, as a Global Health Fellow, work and perform clinical research at the Bugando Medical Centre in Mwanza, Tanzania, after completing residency. My research interests include measuring the impact of treatment availability on cancer epidemiology, implementation science, cost-effectiveness analyses for investment in cancer control, and establishing treatment guidelines for resource-limited settings. Together with Duke radiation therapists, physicists, and biomedical engineers, I am developing a novel immobilization device for breast cancer treatment that can be fabricated in Tanzania. Finally, I have a keen interest in developing global health into a viable career pathway within radiation oncology, and I have published two articles on this topic.

In addition to my global health activities, I have completed several clinical research projects at Duke. In collaboration with medical oncologists at the Duke Cancer Institute, I have examined outcomes and toxicity for the combination of radiation therapy with novel immunotherapies for melanoma. In addition, I analyzed dosimetry to the hippocampus from stereotactic radiosurgery for patients with multiple brain metastases. I identified a sizable minority of patients receiving high dose to the hippocampus, yet most plans could be reoptimized to reduce hippocampal dose without sacrificing target coverage. These data will potentially form the basis for a prospective clinical trial.
Current Residents

Front (left to right): Yvonne Mowery PGY4, Daphna Spiegel PGY3, Christina Cramer PGY5
Second row: Julian Hong PGY2, Daniel Tandberg PGY3, Fumiko Chino PGY2, Jordan Torok PGY5
Third row: Andrew Martella PGY2, Adam Olson PGY4, John Boyle PGY5
Forth Row: Matthew Boyer PGY4, Jeremy Brownstein PGY3, Timothy Robinson PGY5
Residents Research Profile

Timothy Robinson, MD, PhD

During his research period, Dr. Timothy Robinson pursued several projects related to his interests in the application of bioinformatics and mathematics to cancer. Projects during his research time included analysis of the interaction of HIF-1, hypoxia, and radiation therapy using RNA-seq data generated by Dr. David Kirsch’s lab, which was presented at a short oral presentation at ASTRO 2015. Building on prior software he developed as a graduate student, SplicerEX, he designed and validated the ability to inhibit EGFR signaling via a novel splicing-based mechanism in collaboration with Dr. Steve Patierno and Dr. Jennifer Friedman’s labs. He also worked with Dr. Mark Dewhirst to identify a novel putative marker of hypoxia based on alternative mRNA processing. Lastly, in collaboration with Dr. Terry Hyslop and the Duke Endocrine Neoplasia Group, he conducted a mathematical modeling analysis of lymph node evaluation in thyroid cancer that has been selected as an oral presentation at the 2016 Endocrine conference. His work was assisted with funds he was awarded from an RN5A (Radiologic Society of North America) resident research grant.
Message from the Chair  
Dr. Christopher Willett

The Department of Radiation Oncology has four core missions:

- To provide expert, compassionate, and prompt clinical service to our patients.

- To generate new knowledge concerning the causes, prevention, and treatment of cancer.

- To transmit new knowledge, from clinical and laboratory research, to the medical community and the public.

- To actively participate in, and further the missions of the Duke Cancer Institute, Duke School of Medicine, Duke Health System and Duke University.

Clinical research in Radiation Oncology is busy and productive. We have a staff of three full-time nurses supported by an administrative secretary. The research staff have consented 461 patients to prospective clinical trials in our department in just the last three years.

Research trials conducted by our faculty include novel radiation therapies such as pre-operative Stereotactic Body Radiation Therapy (SBRT) in early stage breast cancer correlated with the impact of radiation therapy on gene expression, radiation therapy combined with chemotherapy, device studies like our in vivo nanoFOD feasibility study to measure dosimetric accuracy in gynecological patients receiving brachytherapy, imaging such as the Adaptive PET studies, and tissue/blood sampling research.

Clinical trials are vital in the development and approval of new therapies. On January 6, 2016, a mouse-human Phase I co-clinical trial of a protease-activated fluorescent probe for imaging cancer was published in Science Translational Medicine. This imaging probe (called LUM015) activates in the presence of cathepsin, potentially allowing surgeons to evaluate tumor margins intraoperatively. In this first-in-humans study, LUM015 was given intravenously to breast cancer and sarcoma patients. See the full paper at this link: http://stm.sciencemag.org/content/8/320/320ra4.

For more information, visit: radonc.duke.edu/patient-care/clinical-trials.