NYU Cancer Institute
NYU LANGONE MEDICAL CENTER

ingG16.4422 Translating Cancer Discovery into Clinical Practice
Syllabus Fall 2014

Prerequisite: *Molecular Oncology* (G16.2318)
Offered in the fall each semester. Lecture. Carroll. 4 points.

Course Director: **William L. Carroll, MD**
Director, Cancer Institute
Julie and Edward J. Minskoff Professor of Pediatrics
William.Carroll@nyumc.org

Course Co-Director: **Iman Osman, MD**
Associate Director, Cancer Institute
Director, Interdisciplinary Melanoma Program
Professor of Medicine (Oncology) Dermatology & Urology
Iman.Osman@nyumc.org

Teaching Assistant: Eric Robinson; Eric.Robinson@nyumc.org

Course Description:

This course is designed to educate students about the importance of translation research in oncology. Specifically, it will focus on the growing cross talk between basic science research and clinical oncology for development of novel approaches in managing cancer patients (both from diagnostic and therapeutic stand points).
The course's overarching objective is to transmit the importance of collaboration across oncology disciplines and fostering crosstalk between basic scientists and clinicians. It is also designed to review new therapeutic approaches to cancer and cultivate discussion about how clinicians can formulate ideas through basic science research collaborations.
The first half of the course (which will end with an MCQ mid-term exam) will lay the ground on the general principles of oncology (cancer biology, pathology, principles of chemotherapy, radiotherapy and drug discovery). The second half of the course will focus on specific cancer modules (GI, breast, bladder, melanoma and lung cancer) with an interdisciplinary focus. The course will meet twice a week, be 90 minutes long and take place in a lecture (~60 minutes) and discussion (~30 minutes) format. **This year the course will be held 5:30-7:00pm on Monday and Wednesday in MSB 588, unless otherwise noted.**

Students have access to ALEX network, where required readings will be available before the course begins. PowerPoint presentations will be available for download after each class.

In summary, this course aims to:

1. Illustrate the multidisciplinary nature of cancer treatment and begin the tradition of cross talk between basic scientists and clinicians.
2. Review promising novel approaches using specific cancer modules
3. Foster discussion about how students can think of therapeutic opportunities for their own research efforts in cancer biology
4. Supplement the background contained in the Molecular Oncology Course by reviewing conventional therapeutic principles and implementation of basic research findings into clinical application

Grading The breakdown of evaluation is as follows:

Attendance: 10%
Participation: 10%
Midterm Exam: 40% (MCQ format)
Final Exam: 40% (MCQ format)

Class Schedule

Date/Time/ Location	Instructor(s)	Lecture Theme and Guiding Topics	Recommended Readings
Wednesday 9/3/14, 5:30pm MSB 588	William Carroll, MD & Iman Osman, MD	General Principles Module a. Introduction	**Simon, R. *Expert Rev Mol Med* 2010** **Minasian, LM, et al. *Cancer* 2010**
Monday 9/8/14, 5:30pm MSB 588	Baljit Singh, MD	General Principles of Clinical Cancer Biology – Pathology a. How are cancers diagnosed and staged? b. How do newer imaging modalities establish invasiveness, metastatic spread and response to therapy? c. What are routine diagnostic tests done by pathologists to establish cell/tissue of origin and grade? What is the purpose of a "frozen section"? d. What happens when the pathologist can't determine the primary origin of a particular tumor (a case of the "unknown primary")?	**Kumar, Pathologic Basis of Disease 2014** **Sorlie, T, et al. *Proc Natl Acad Sci U S A* 2001** **Paik, S, et al. *N Engl J Med* 2004** **Hammond et al, *JCO* 2011** **Wolf, A, et al. *JCO* 2013**
Wednesday 9/10/14, 5:30pm MSB 588	William Carroll, MD	Principles of Chemotherapy a. How does chemotherapy really work? b. What are the mechanisms that tumor cells use in vivo to escape treatment? c. Can tumors be screened ex vivo to determine susceptibility to selected agents?	**Widemann, B and P Adamson. *Cancer in Children and Adolescents* 2010** **Gerber, DE and JD Minna. *Cancer Cell* 2010**
Monday 9/15/14, 5:30pm MSB 588	Russell Berman, MD	Surgical Principles a. When is a biopsy performed vs. a resection? b. How do surgeons plan tumor removal before and during an operation? c. What is the value of "robotic" surgery?	**Bonenkamp, JJ, et al. *N Engl J Med* 1999** **Balch, CM, et al. *Ann Surg Oncol* 1994**
Wednesday 9/17/14, 5:30pm MSB 5888	Aristotelis Tsirigos, PhD	Introduction to Essential Bioinformatics Methods and Tools	**TBD**
Monday 9/22/14, 5:30pm MSB 588	Peter B. Schiff, MD, PhD	Principles of Radiation Biology a. How does radiation therapy work? b. How does one choose the radiation therapy approach to fit the particular tumor? c. What are the new radiation treatments approaches including proton beam?	**Camphausen, KA and LR Coia. Cancer Management 2009** **Podgorsak, EB. "Basic Radiobiology" 2006** **Durante, M and JS Loeffler. Nat Rev Clin Oncol 2010** **Ma, Y, et al. Semin Immunol 2010**

			Forment, SC and S Demaria. *J Natl Cancer Inst.* 2013
Wednesday 9/24/14	**NO CLASS SCHEDULED**		
Monday 9/29/14, 5:30pm MSB 588	Mace Rothenberg, MD (Pfizer)	How New Drug Discovery Really Works, Part I a. How do pharmaceutical companies think about drug development? b. What are the common mistakes early in the process that prevent a drug from making it further in the pipeline?	**Kwak, et al. N Engl J Med 2010** **Soda, et al. PNAS 2008** **Goff, LW, et al. *Invest New Drugs* 2010** **Ou, et al. The Oncologist 2012**
Wednesday 10/1/14, 5:30pm MSB 588	Grant Williams, MD (Williams Cancer Drug Consulting)	How New Drug Discovery Really Works, Part II a. What are the steps in developing new drugs from discovery, pre-clinical development and validation and clinical evaluation? b. What are the regulatory guidelines for FDA approval?	**TBD**
Monday 10/6/14, 5:30pm MSB 588	Cyrus Hedvat, MD, PhD	Integration of Genomic Testing in Clinical Care, Part I	**TBD**
Wednesday 10/8/14, 5:30pm MSB 588	Adriana Heguy PhD	Integration of Genomic Testing in translation research, Part II	**TBD**
Monday 10/13/14, 5:30pm MSB 588	**NO CLASS SCHEDULED**		
Wednesday 10/15/14, 5:30pm MSB 588	**Midterm**		
Monday 10/20/14, 5:30pm MSB 588	Elliot Newman, MD	Pancreatic & Colon Cancer Module: Landmark Clinical Trials in GI Oncology a. Studies of major randomized clinical trials in GI Oncology that have shaped modern therapeutics in gastro-esophageal, colorectal, and pancreatic cancer	**Lombardi, L, et al. *Cancer Treat Rev* 2010**
Wednesday 10/22/14, 5:30pm MSB 588	Lawrence Leichman, MD	Targeted Therapy in GI oncology: a. Current paradigms and future directions b. Current advances in targeted agents for gastrointestinal cancers and prospects for personalized oncologic care c. Integrated GI Oncology: Science and art of combining therapeutic modalities for optimal outcomes in GI cancers using the paradigm of metastatic colorectal	**Hurwitz, H, et al. *N Engl J Med* 2004** **Douillard, JY, et al. *N Engl J Med* 2014** **Bar-sagi senior author; *Cancer Cell* 2014**

		cancer	
Monday 10/27/14,5:30pm MSB 588	Lawrence Leichman, MD	Targeted Therapies in GI Oncology (continued)	
Wednesday 10/29/14, 5:30pm MSB 588	Komal Jhaveri, MD	Breast Cancer Module: Diagnosis, Epidemiology	**TBD**
Monday 11/3/14, 5:30pm MSB 588	Francisco Esteva, MD	Breast Cancer Module: Treatment a. Endocrine therapy b. HER2-directed therapy c. Molecular targets in triple negative breast cancer d. Mechanisms of drug resistance	**Giordano, S. JCO 2014.** **Esteva, FJ. Nat Rev Clin Oncol 2009.** **Baselga, J. NEJM 2012** **Foulkes. NEJM 2010**
Wednesday 11/5/14, 5:30pm MSB 588	Sylvia Adams, MD	Breast Cancer Module: Immunotherapy	**Adams, S, et al. *JCO* 2014.**
Monday 11/10/14, 5:30pm MSB 588	David Polsky, MD, PhD	Melanoma Module: Melanoma Incidence Is Rising Faster Than Other Tumors a. A model to study the dilemma of genes and environmental interaction	**Thomas, D. *Nat Rev Genet* 2010** **Torres, SM, et al. *Pigment Cell Melanoma Research.* 2013**
Wednesday 11/12/14, 5:30pm MSB 588	Eva Hernando, PhD	Melanoma Module: Targeted therapy in melanoma a. Targeting BRAF in Melanoma b. Targeting-kit in melanoma c. Uveal melanoma	**Kabbarah, O, et al. PLoS One 2010** **Flaherty, KT and G McArthur. Cancer 2010**
Monday 11/17/14, 5:30pm MSB 588	Nina Bhardwaj, MD, PhD	Melanoma module: Immunotherapy a. Role of immunotherapy in melanoma treatment	**Weber, J. Semin Oncol 2010** **Fadel, F, et al. N Engl J Med 2009**
Wednesday 11/19/14, 5:30pm MSB 588	James Suh, MD	Lung Cancer Module: Pathology Perspectives a. Morphologic and Molecular classification of Adenocarcinoma b. Implementation of Lung cancer Biomarker Testing in Clinical Practice	**Yoshizawa, A, et al. Mod Pathol 2011** **Travis, WD, et al. J Thorac Oncol 2011** **The Cancer Genome Atlas Research Network. *Nature* 2014.**
Monday 11/24/14 MSB 588	William Rom, MD, MPH or James Tsay, MD	Lung Cancer Module: Early Detection a. CT Screening and Metabolic Imaging for the early detection of Lung cancer b. Biomarkers for the Early Detection/Classification of Lung Cancer	**TBD**

Wednesday 11/26/14	**NO CLASS SCHEDULED**		
Monday 12/1/14, 5:30pm MSB 588	Abraham Chachoua, MD	Lung Cancer Module: Implications for Therapy Mutations, FISH, and IHC: Use for Prediction of Biologic and Cytotoxic Therapy	**TBD**
Wednesday 12/3/14, 5:30pm MSB 588	Xue-Ru Wu, MD	Bladder Cancer Module: Pre-clinical a. What sets bladder cancer apart from other cancers? b. Modeling bladder cancer using genetically engineered mouse models c. Latest Developments d. Clinical Implications	**Wu, XR. *Nat Rev Cancer* 2005** **Wu, XR. *Cancer Metastasis Rev*. 2009** **Cancer Genome Atlas Research Network, *Nature* 2014** **(Refresh)**
Monday 12/8/14 5:30pm MSB 588	Arjun Balar, MD	Bladder Cancer Module: Treatment	**TBD**
Wednesday 12/10/14 5:30pm MSB 588	**NO CLASS SCHEDULED**		
Monday 12/15/14, 5:30pm MSB 588	**Final Exam**		