



Weill Cornell Medicine
Meyer Cancer Center



2017 Annual Report

Lewis C. Cantley, Ph.D.
Meyer Director

Translating basic science discoveries into clinical applications that change the standard of care for cancer patients is the central mission of the Sandra and Edward Meyer Cancer Center.

In the past year, we have continued to strengthen the support we provide to our members through programs and resources that will broaden our impact in basic science, translational research and patient care.

Leadership

Leadership is a critical component of an effective organization, and the Meyer Cancer Center senior leadership team provides strategic direction and oversight in the areas of basic science, clinical research, clinical care and administration.

- **John Blenis, Ph.D., Associate Director of Basic Science**, oversees the direction of basic science research programs, as well as the Collaborative Research Initiative, the annual Meyer Cancer Center pilot grant program.
- **Julie L. Boyer, Ph.D., Associate Director of Administration**, supports all aspects of cancer center strategic development and provides oversight for cancer center initiatives and resources.
- **Andrew Dannenberg, M.D., Associate Director of Cancer Prevention**, provides recommendations on program development in population sciences.
- **Howard A. Fine, M.D., Associate Director of Translational Research**, has responsibility for facilitating collaborations between basic scientists and clinical researchers.
- **Silvia Formenti, M.D., Associate Director of Radiation Oncology**, integrates the efforts of our growing immunotherapy program on the continuum from basic science through clinical practice.
- **John P. Leonard, M.D., Associate Director of Clinical Research**, facilitates a robust clinical trials operation, ensuring that our clinical trial portfolio meets the metrics for an NCI-designated cancer center.
- **David M. Nanus, M.D., Associate Director of Clinical Services**, has responsibility for establishing a unified clinical practice that will provide the highest quality multidisciplinary care across divisions, departments and centers.
- **Barry Sleckman, M.D., Ph.D., Associate Director of Shared Resources**, oversees resource operations that support basic, translational and clinical research.

In 2017, Mark Rubin, M.D., Associate Director of Precision Medicine and Director of the Englander Institute for Precision Medicine, transitioned to the University of Bern in Switzerland. But he remains connected to our research efforts in prostate cancer through a multi-investigator SPORE grant in prostate cancer that involves multiple Meyer Cancer Center members.

Administration

A team of dedicated professionals implements the vision of the Director, **Lewis Cantley, Ph.D.**, and supports the efforts of all Meyer Cancer Center (MCC) members. These individuals work collaboratively with **Julie Boyer, Ph.D.**, Associate Director of Administration, to develop strategic plans, manage MCC finances, guide research programs, promote shared research resources, coordinate seminars, evaluate membership, facilitate recruitment, distribute pilot grant funding, disseminate information, enhance cancer clinical trial portfolios and support clinical initiatives:

- **Erick Herrscher, Assistant Director, Administration** – Mr. Herrscher is the key administrator providing strategic oversight for development, submission, management and maintenance of a National Cancer Institute P30 Cancer Center Support Grant. He is also leading the implementation of informatics systems to collect relevant cancer center data and interfaces with the Joint Clinical Trials Office to align our cancer clinical trial portfolios with NCI requirements.
- **Katelyn Carbonell, Research Program Manager** – Ms. Carbonell provides oversight for the ongoing development of MCC Research Programs according to NCI guidelines. She is responsible for data acquisition and preparation in support of the P30, and manages all MCC research-related initiatives.
- **Bo Wang, Finance Administrator** – Mr. Wang is responsible for the direct administration of the MCC Director's grant portfolio and supports Meyer Cancer Center financial activities.

Faculty

Meyer Cancer Center Membership

From the inception of the Meyer Cancer Center, membership has been inclusive; any health professionals and/or laboratory, clinical, or population research scientists holding a full-time faculty appointment at Weill Cornell Medicine or Cornell Ithaca who demonstrate involvement in cancer research and/or patient care and are interested in fulfilling the mission of the cancer center have been considered members. The Meyer Cancer Center membership totaled **291 full-time faculty members** in 2017.

With the expansion of membership, the Meyer Cancer Center continued to develop its Cancer Center Support Grant membership strategy, adhering to the standards set forth by the National Cancer Institute. Eligible members for the Cancer Center Support Grant include any full-time faculty member of Weill Cornell Medicine who:

1. has cancer-relevant peer-reviewed non-training funding from the NIH/NCI or from an NCI-recognized organization; or
2. is a clinical science leader as evidenced by leadership of therapeutic investigator initiated institutional trials (in-house, internally reviewed trials, including those collaborative studies conducted with industry sponsorship in which the center is a primary contributor to the design, implementation, and monitoring of the trial, or participation in a multi-site trial initiated by an investigator at another center); or
3. is newly recruited in collaboration with the Meyer Cancer Center and is still within their start-up phase; or
4. holds a Meyer Cancer Center leadership position.

Membership is reviewed annually by Research Program Leaders to ensure relevance of the member's professional activities to the Meyer Cancer Center's mission. Continued membership is contingent upon maintenance of the specified criteria.

Recruitment

Strategic recruitment of faculty members to expand or enhance existing research programs or capabilities has been a continued MCC focus. New faculty members in 2017 include:

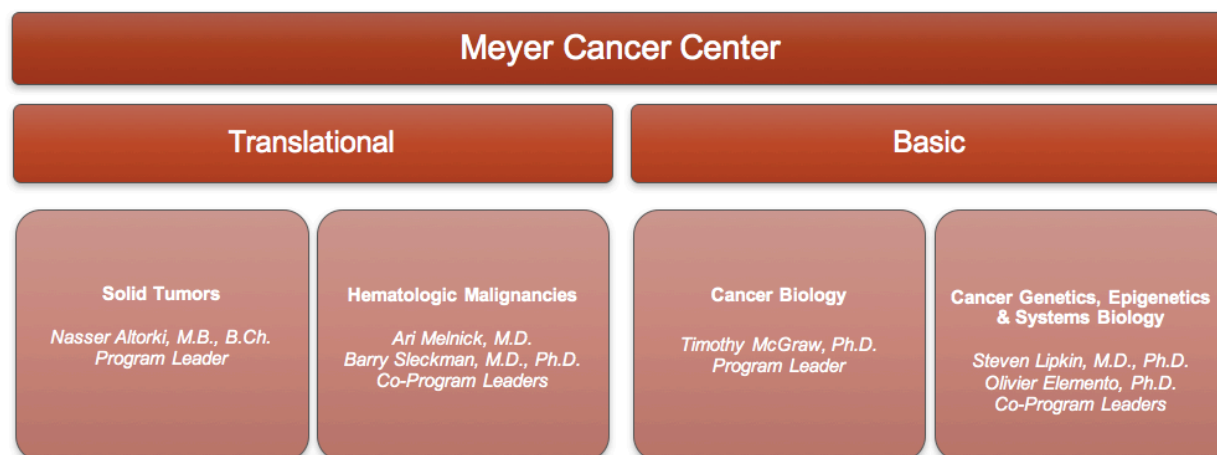
- **Rohit Chandwani, M.D., Ph.D.**, is an Assistant Professor with a faculty appointment in the Department of Surgery, recruited from Memorial Sloan Kettering Cancer Center. He is a board-certified oncologist and the Principal Investigator of a laboratory studying the epigenetics of pancreatic and liver cancer.
- **Niro Anandasabapathy, M.D., Ph.D.**, was recruited from Dana-Farber/Harvard Cancer Center and has a primary appointment in the Department of Dermatology. Her research focuses on studying dendritic cells in skin and lymphoid tissues as cancers arise and their potential application to cancer vaccines.

To continue expanding the breadth of our clinical care and basic research programs, there are active searches for faculty members with expertise in the areas of thoracic oncology, breast oncology and tumor immunology.

Research Programs

As we progress toward our goal of becoming an NCI-designated cancer center, via the NCI P30 Cancer Center Support Grant, we continue to assess our research strengths and align ourselves with NCI guidelines. The current membership structure has been organized to reflect our strongest basic, translational and clinical research while capturing our maximum extramural funding base.

The following table summarizes Research Programs structure:

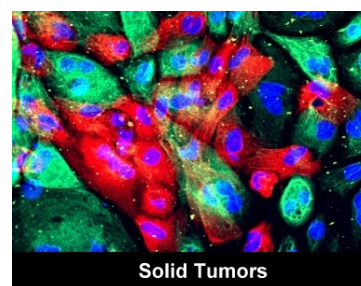


Research Programs are organized according to clinical and basic research strengths, which span across four major areas: Solid Tumors, Hematologic Malignancies, Cancer Biology and Cancer Genetics, Epigenetics and Systems Biology. Research Programs foster interactive and innovative research opportunities amongst members whom share common scientific interests and goals. Members collaborate on peer-reviewed research, publications and clinical studies. Monthly program meetings catalyze multi-investigator, multidisciplinary and preclinical and clinical translational research.

Solid Tumors Research Program

Program Leader: **Nasser Altorki, M.D.**

The Solid Tumors Research Program is composed of researchers conducting translational studies centered on diagnosis, treatment and therapy of a variety of cancer types – breast, lung, genitourinary, gastrointestinal and brain. Objectives of the Solid Tumors Research Program include the exploration of underlying mechanisms of cancer progression, identifying novel therapeutic targets and advancing innovative technologies for treatments.



Dr. Altorki assumed the Program Leader role in early 2017, replacing Dr. Cantley, who served as the interim leader. Dr. Altorki is the Director of the Lehman Brothers Lung Cancer Research Center and oversees the clinical lung cancer program at NewYork-Presbyterian/Weill Cornell Medicine. Dr. Altorki's research focuses on the use of immunotherapy in the treatment of early stage lung and esophageal cancers as characterizing the molecular events associated with progression of precursor lesions to invasive pulmonary adenocarcinoma.

The Solid Tumors Research Program meets monthly and has made significant progress toward establishing inter- and intra-programmatic collaborations by holding joint-program meetings, wherein meeting presenters are paired with "investigative counterparts" to provide a combined clinical and basic approach to disease-specific

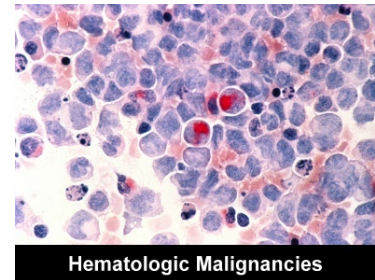
inquiries. Important accomplishments of the solid tumor program in the past year include a SPORE award in prostate cancer, a Stand Up to Cancer award in colorectal cancer and an ongoing U01 studying the lung cancer microenvironment.

Hematologic Malignancies Research Program

Program Co-Leaders: **Ari Melnick, M.D.**

Barry Sleckman, M.D., Ph.D.

Co-led by Dr. Ari Melnick, whose research aims at understanding the mechanisms through which transcriptional and epigenetic regulation become disrupted in cancers, and Dr. Barry Sleckman, whose laboratory studies the response to genomic DNA damage, the Hematologic Malignancies Research Program encompasses a spectrum of disease-specific areas and is composed of five working groups, which capture membership diversity.



- Lymphoid Malignancies Working Group – Peter Martin, M.D., and Kristy Richards, M.D., Ph.D.
- Myeloid Malignancies Working Group – Gail Roboz, M.D.
- Myeloma Working Group – Ruben Niesvizky, M.D.
- Myeloproliferative Neoplasms Working Group – Andrew I. Schafer, M.D.
- Bone Marrow Transplant Working Group – Koen van Besien, M.D.

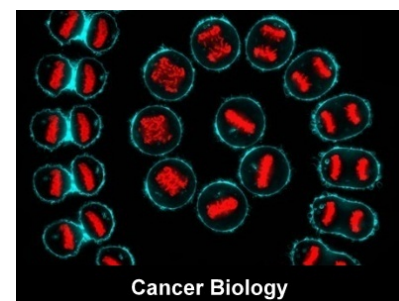
These disease-specific working groups provide clinicians and researchers with a platform to more acutely identify and discuss investigative opportunities for treatments and therapies in unique patient populations.

Cancer Biology Research Program

Program Leader: **Timothy McGraw, Ph.D.**

In 2017, Dr. Timothy McGraw was selected by the MCC Senior Leadership team to lead the Cancer Biology Research Program. Dr. McGraw's laboratory investigates endocytic membrane trafficking and mechanisms of metabolic pathway signaling.

The Cancer Biology Research Program investigates the difference between normal cells and cancer cells to better understand basic mechanisms that promote tumor development and behavior. By examining the interaction of tumor cells with their normal counterparts and microenvironment, along with transcription factors, cellular signaling events and cellular architecture that impact malignant transformation, the program seeks to identify molecular targets for intervention.



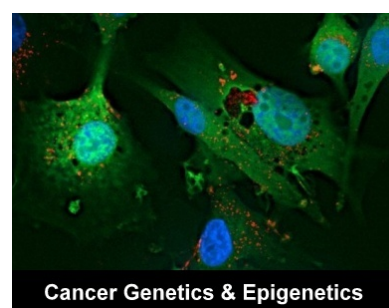
Cancer Genetics, Epigenetics and Systems Biology Research Program

Program Co-leaders: **Olivier Elemento, Ph.D.**

Steven Lipkin, M.D., Ph.D.

The Cancer Genetics, Epigenetics, and Systems Biology (CGESB) Research Program is co-led by Drs. Steven Lipkin and Olivier Elemento. Dr. Lipkin's research focuses on cancer predisposition gene mutations, mechanisms of tumorigenesis and immunoprevention of patients with DNA repair gene mutations. Dr. Elemento's laboratory is centered around the systems biology of regulatory networks in normal and malignant cells. His work on the epigenomics of cancer includes high-throughput experimental approaches and pattern detection techniques to investigate the function of these genes.

Members of the Cancer Genetics, Epigenetics and Systems Biology Program use next-generation sequencing, advanced computing and experimentation to identify and understand the function of genetic and epigenetic alterations in tumors. These can be translated into precision medicine clinical tools, such as biomarkers for therapy selection, predisposition and early cancer detection as well as targets for novel cancer therapies.



Internal Grants

As scientific advances have substantially impacted the most complex cancer research questions, the funding from the National Institutes of Health and other federal agencies required to support this work has significantly diminished nationwide. To support innovative, collaborative research that is promising yet unfunded, the Meyer Cancer Center formally established the **Collaborative Research Initiative (CRI)**. The CRI, supported in part by the Cancer Research Innovation Fund and led by Associate Director of Basic Science, **John Blenis, Ph.D.**, promotes scientific excellence in research projects based on population science, basic, translational or clinical cancer research. The CRI seeks to facilitate high-quality partnerships that will ultimately result in competitive external grant applications and increase the center's funding base in alignment with NCI designation requirements.

Two separate requests for applications were circulated to Weill Cornell faculty, encouraging eligible investigators to apply. The first, a Pre-R01 RFA released in May, focused on investigators' ability to generate preliminary data and/or evidence of publication to transition to cancer-focused R01-type grant applications. A minimum of two investigators per application was required to encourage inter- and intra-programmatic collaborations. The CRI received a total of 34 applications. Following a standard peer review process, four separate teams were awarded \$100,000 each.

Juan Cubillos – Ruiz, Ph.D.
Department of Obstetrics and Gynecology

Nutrition-based Immune Reprogramming to Enhance Cancer Immunotherapy

Andrew Dannenberg, M.D.
Department of Medicine

Lukas Dow, Ph.D.
Department of Medicine

Functional Characterization of DNA Regulatory Regions Recurrently Deleted in Human Cancer

Yariv Houvras, M.D., Ph.D.
Department of Surgery

Evi Giannakakou, Ph.D.
Department of Medicine

Overcoming Gastric Cancer Treatment Resistance by Targeting CLIP-170S: A Molecular, Computational, and Translational Program

Olivier Elemento, Ph.D.
Department of Physiology and Biophysics
Institute for Computational Biomedicine

Manish Shah, M.D.
Department of Medicine

Monica Guzman, Ph.D.
Department of Medicine

Mechanisms of Telomere Maintenance in Myeloid Leukemia and Therapeutic Potential

Neal Lue, M.D., Ph.D.
Department of Microbiology and Immunology

A multi-investigator planning grant RFA was released in August to solicit multi-investigator pre-P01/SPORE applications. The purpose of the RFA was to assist in solidifying project feasibility and planning for future external funding, including P01 or SPORE-type applications. Four competitive applications were received, two of which were funded.

A team lead by **Manish Shah, M.D.**, in collaboration with project PIs **Olivier Elemento, Ph.D.**, **Doron Betel, Ph.D.** and **Gregory Sonnenberg Ph.D.** was awarded \$50,000 for their *Developing Immunotherapy in Foregut Malignancies* program. This unique group of investigators will focus on understanding the drivers of response to immunotherapy in upper GI malignancies with the primary motivation of improving the efficacy of immunotherapy in gastric and esophageal cancers. Preliminary results from this application will be used in a future NIH P01 application.

Led by **Vivek Mittal, Ph.D.**, a second team of investigators, including **Xin-Yun Huang, Ph.D.**, and **Kristy Brown, Ph.D.** was awarded \$50,000 for their application entitled *Developing Targeted Therapies for Triple Negative Breast Cancer*. The central goal of this program is to understand the molecular and cellular mechanisms of therapeutic resistance and metastasis and to capitalize on these fundamental discoveries to

develop and test novel combination therapies for treatment of Triple Negative Breast Cancer. These investigators will seek future external funding opportunities via the NIH's P20 mechanism, following exploratory and developmental research findings.

External Grants

Twelve new grants from the National Cancer Institute were awarded to twelve different cancer center members, totaling over **\$2.5 million** in annual direct costs to research. The cancer center's total research grant portfolio contained more than **115** cancer-focused research grants, 48 of which were awarded from the National Cancer Institute. The annual direct costs of the portfolio amounted to more than **\$25 million**, for basic, translational, and clinical research.

Among them was a Specialized Programs of Research Excellence (SPORE) grant from the NCI with a total budget of **\$11.3 million** over five years. SPORE grants aim to improve the collaborative efforts around interdisciplinary translational cancer research associated with 19 specific organ sites. Led by **Mark Rubin, M.D.**, the SPORE will build upon WCM's existing strengths in basic and translational prostate research. The award will help facilitate bench-to-bedside discoveries paramount to improving disease detection, diagnosis, treatment and patient outcomes. A team of sixteen researchers, eleven of whom are WCM faculty, including Drs. Karla Ballman, Chris Barbieri, Julie Boyer, Olivier Elemento, Paraskevi Giannakakou, Lorraine Gudas, Juan Miguel Mosquera, David Nanus, David Rickman, Brian Robinson and Douglas Scherr, will work toward understanding and treating this metastatic disease.

Members of the Meyer Cancer Center also received several distinguished grants in 2017:

- **Paraskevi Giannakakou, Ph.D.**, and **John Blenis, Ph.D.**, received a T32 training grant to support postdoctoral scholars in molecular and translational oncology research by providing mentoring opportunities and fostering collaborations with MCC's accomplished clinical faculty.
- **Lewis Cantley, Ph.D.**, and **Manish Shah, M.D.**, along with Drs. Karla Ballman, Olivier Elemento, Giorgio Inghirami, Himisha Beltran, Steven Gross and John Babich were named to the Stand Up to Cancer's (SU2C) "Colorectal Cancer Dream Team." The \$12 million award will assist in targeting genomic, metabolomics and immunological vulnerabilities in colorectal cancer.
- **Howard Fine, M.D.** was awarded the NIH Director's Pioneer Award, an award recognizing high-risk, high-reward research by individual PIs who exhibit exceptionally creative and pioneering approaches to major challenges in biomedical and behavioral research. This \$5.9 million grant will facilitate the establishment of a cerebral organoid drug-screening core for brain cancer treatment.

Research Excellence

The Meyer Cancer Center was well represented throughout the broader research community both nationally and abroad at prominent conferences and research events, including the American Association for Cancer Research (AACR), the American Society of Clinical Oncology (ASCO) the American Society for Hematology (ASH), as well as the Immuno-Therapy, Radio-Therapy Combinations International Conference, hosted here at Weill Cornell Medicine.

The research efforts of our faculty were published in several high impact journals:

- **Scott Blanchard, Ph.D.**, and collaborators examined ligand efficacy in β_2 AR-G-protein activation through single-molecule analysis, a study published in *Nature*.
- “TOR, the Gateway to Cellular Metabolism, Cell Growth, and Disease” by first author, **John Blenis, Ph.D.**, was published in *Cell*.
- **Lewis Cantley, Ph.D.**, was featured in *Cell* for his work on the role of class I PI3Ks in the regulation of cellular metabolism and in immune system functions.
- Collaborators **Samie Jaffery, M.D., Ph.D.**, **Olivier Elemento, Ph.D.**, and **Steven Gross, Ph.D.**, found that mRNA stability is impacted by epitranscriptomic modification in a study reported in *Nature*.
- **Frederick Maxfield, Ph.D.**’s work on mitochondrial fission and apoptotic cells was published in *Cell*.
- “Untangling the Web of Lymphoma Somatic Mutations” was published in *Cell* by last author **Ari Melnick, M.D.**; a study that provided an overview of the biology of B cell lymphomas, which could help inform future precision medicine approaches.
- **David Lyden, M.D.**, explored pre-metastatic niches and the role of circulating tumor cells in a study published in *Nature Reviews Cancer*.
- **Himisha Beltran, M.D.**, and **Lukas Dow, Ph.D.**, collaborated on their study, “Transplantation of Engineered Organoids Enables Rapid Generation of Metastatic Mouse Models of Colorectal Cancer,” in an article featured in *Nature Biotechnology*.
- In his study of the piggyback transposable element derived 5 gene (PGBD5), **Christopher Mason, Ph.D.**, found that as an oncogenic mutator, the PGBD5 gene is a plausible mechanism for DNA rearrangements in solid tumors, a study published in *Nature Reviews Molecular Cell Biology*.

- **Jason Butler, Ph.D., Shahin Rafii, M.D., and Olivier Elemento, Ph.D.,** were featured in *Nature* for their collaboration on “Conversion of Adult Endothelium to Immunocompetent Haematopoietic Stem Cells”.
- **Harold Varmus, M.D.,** commented on the importance of 2017’s Lasker-DeBaakey Prize recipients’ work on the development of vaccines that prevent infection and tumor induction of HPV, in *Cell*.

Seminar Series

The Meyer Cancer Center monthly seminar series hosted many prominent guests who presented their ongoing work on a wide variety of clinical, basic and translational cancer research topics. The seminar series includes both the Director’s Seminars and endowed lectures. To incorporate topics of broad interest, suggestions for speakers are solicited from each research program.

2017 Meyer Cancer Center Director’s Seminar Series

January 18	Lajos Pustzai, M.D., D.Phil. Yale University	<i>Immune Sculpting of the Triple Negative Breast Cancer Genome</i>
February 15	Tim Chan, M.D., Ph.D. Memorial Sloan Kettering Cancer Center	<i>Immunotherapy: What’s Genes Got to do With It?</i>
March 15	Rakesh Jain, Ph.D. Massachusetts General Hospital	<i>Reengineering the Tumor Microenvironment to Improve Cancer Treatment</i>
June 21	Ben Neel, M.D., Ph.D. New York University School of Medicine	<i>New Signaling Connections in Cancer</i>
September 20	Victor Engelhard, Ph.D. University of Virginia School of Medicine	<i>Phosphopeptides Displayed by MHC Molecules as Next-Generation Cancer Immunotherapy Targets</i>
November 15	Raffaella Sordella, Ph.D. Cold Spring Harbor Laboratory	<i>Cellular Plasticity in Tissue Regeneration and Cancer-Drug Resistance</i>

In addition to the above seminar series, the MCC is fortunate to sponsor three endowed lectures featuring distinguished investigators who present research and clinical discoveries that represent seminal advances in cancer prevention or treatment.

The Mark S. Brower, M.D., Lecture in Hematology and Oncology was established to honor the memory of this beloved physician and faculty member. This annual lecture features internationally-recognized physicians, scientists or physician scientists that are advancing cancer care and research.

2017 – **James P. Allison, Ph.D.**

The University of Texas M.D. Anderson Cancer Center

'Immune Checkpoint Blockade in Cancer Therapy: New Insights, Opportunities and Prospects for a Cure'



James P. Allison, Ph.D.

2016 – **Siddhartha Mukherjee, M.D., Ph.D.**

Columbia University

'The Changing Landscape of Cancer: Past, Present & Future'

2015 – **Harold Varmus, M.D.**

Weill Cornell Medicine

'Confronting Cancer's Complexity'

2014 – **Lewis Cantley, Ph.D.**

Weill Cornell Medicine

'Advances in Cancer Research: On the Front Lines of the Revolution'

The Daniel G. Miller, M.D., Endowed Lecture in Cancer Prevention honors the memory of this outstanding physician and distinguished pioneer in cancer prevention research.

2017 – **Scott Lippman, M.D.**

Moore's Cancer Center

'Pre-cancer Atlas to Drive Precision Prevention and Immune Interception'



Scott Lippman, M.D.

2016 – **Michael Pollak, M.D.**

McGill University

'Diabetes, Obesity, and Cancer: Pharmacology and Physiology at the Interface'

2015 – **Ernest Hawk, M.D., M.P.H.**

The University of Texas M.D. Anderson Cancer Center

'Advancing Cancer Prevention and Control as Plan A'

2014 – **Kenneth Kinzler, Ph.D.** (Johns Hopkins University)

The Andrew I. Schafer, M.D., Lectureship in Hematologic Malignancies honors the leadership and mentorship of Andrew I. Schafer, M.D., a distinguished hematologist and leader in academic medicine.

2017 – **Anthony Green, M.D., Ph.D.**

University of Cambridge

‘JAK/STAT Signaling, Stem Cell Subversion and Myeloid Malignancies’



Anthony Green, M.D., Ph.D.

2016 – **Harinder Singh, Ph.D.**

University of Cincinnati

‘Towards a Gene Regulatory Logic of Immune Cell Development and Function’

2015 – **Bertrand Nadel, Ph.D.**

Centre d’Immunologie de Marseille-Luminy

‘Follicular Lymphoma: Immunogenetics Ahead of Disease’

2014 – **Gabriel Rabinovich, Ph.D.**

University of Buenos Aires

‘Integrating Immune and Vascular Signaling Programs in Cancer through Lectin-Glycan Interactions’

Research Events

Special Seminars

In an effort to expand our collaborative endeavors and to further promote the numerous research interests and areas represented by our membership, the Meyer Cancer Center is proud to have partnered with several departments in WCM/NYP to host special seminars throughout the year. The inclusion of special seminars as part of our sponsored events at the MCC encourages the participation, involvement, and representation of various disciplines across the institution. The considerable contributions made at the departmental level to stimulate scientific discussion and integration strengthens the WCM/NYP research community.

Translational Research Workshop

Translational Research Workshops facilitate a productive exchange of cancer drug development ideas among cancer center investigators. This bi-annual forum, led by **Selina Chen-Kiang, Ph.D.**, and **Ruben Niesvizky, M.D.**, allows clinicians, basic scientists and representatives from the pharmaceutical industry to discuss clinically relevant therapeutic drug targets, the laboratory methods used to study the associated pathways, and clinical protocols to evaluate drug efficacy.

The first workshop of 2017, which convened in May, focused on genomic instability and cancer. The program featured speakers from the Meyer Cancer Center as well as the

UCSF Helen Diller Family Comprehensive Cancer Center and the Dana-Farber Cancer Institute, and was followed by a panel discussion with all speakers.

Targeting Genomic Instability in Cancer

Alan Ashworth, Ph.D., F.R.S.
University of California, San Francisco

Synthetic Lethal Strategies for Targeting DNA Repair in Cancer

Alan D'Andrea, M.D.
Dana Farber Cancer Institute

PARP Inhibitor Resistance and Acquired Vulnerability in Ovarian Cancer

Himisha Beltran, M.D.
Weill Cornell Medicine

DNA Repair in Prostate Cancer: Biologic and Clinical Applications

Lewis Cantley, Ph.D.
Weill Cornell Medicine

DNA Damage and Cell Metabolism

The fall workshop (October 2017) examined the difference between drugs that target hormone receptors and drugs that reduce hormone levels in breast and prostate cancers, including the emergence of resistance. In addition to presentations from Meyer Cancer Center investigators, this workshop featured Charles Sawyers, M.D., from the Memorial Sloan Kettering Cancer Center as the keynote speaker.

Targeting the Cancer Epigenome

Charles Sawyers, M.D.
Memorial Sloan Kettering Cancer Center

Acquired Resistance to Hormone Therapy in Prostate Cancer

Chris Barbieri, M.D., Ph.D.
Weill Cornell Medicine

Defining, Modeling and Targeting Distinct Molecular Classes of Prostate Cancer

Kristy Brown, Ph.D.
Weill Cornell Medicine

Obesity and Breast Cancer – From Estrogen to Hunger Hormones

Olivier Elemento, Ph.D.
Weill Cornell Medicine

Genomics of Prostate Cancer and Precision Medicine

Annual Retreat

'A Cure Through Collaboration,' held on April 7, 2017, was a center-wide retreat which featured one-half day of faculty talks and brainstorming sessions to promote transdisciplinary collaborations amongst cancer center members. Chaired by Associate Director of Translational Research, **Howard Fine, M.D.**, a retreat planning committee was established to help formulate a stimulating and productive agenda, centered around developing strategic bench-to-bedside partnerships.

Dr. Cantley and **Cam Patterson, M.D.**, Senior Vice President and Chief Operating Officer for NYP/WCM, welcomed participants with introductory remarks highlighting oncology as a top priority for the institution as well as progress made to date with regard to cancer care initiatives.

The remainder of the program highlighted examples of successful partnerships amongst center members in research, including clinical and scientific resources and clinical and basic science collaborations.

Retreat Agenda

Clinical & Scientific Shared Resource Collaborations

Karla Ballman, Ph.D.
Andrew Dannenberg, M.D.

Biostatistics Core

Giorgio Inghirami, M.D.
Doron Betel, Ph.D.
Effie Apostolou, Ph.D.

Bioinformatics Core

Barry Sleckman, M.D., Ph.D.
Nasser Altorki, M.B., B.Ch.

Biobanking Core

John Leonard, M.D.
Karla Ballman, Ph.D.
Scott Tagawa, M.D.

Joint Clinical Trials Office

Clinical & Basic Science Collaborations

Paraskevi Giannakakou, Ph.D.
Scott Tagawa, M.D.

Use of CTCs for Precision Medicine in Real Time in Prostate Cancer

Nasser Altorki, M.B., B.Ch.
Dan Landau, M.D, Ph.D.
Vivek Mittal, Ph.D.

Liquid Biopsy for Early Stage Lung Cancer

Selina Chen-Kiang, Ph.D.
Peter Martin, M.D.

Targeting CDK4 in Mantle Cell Lymphoma: Basic Mechanisms and Clinical Advances

Lewis Cantley, Ph.D.
Manish Shah, M.D.

SU2C: Colorectal Cancer Dream Team

Panel Discussion: Facilitating Scientist/Clinician Collaborations

Moderated by Howard Fine, M.D.

Panelists:

Paraskevi Giannakakou, Ph.D.	Vivek Mittal, Ph.D.
Scott Tagawa, M.D.	Selina Chen-Kiang, Ph.D.
Nasser Altorki, M.B., B.Ch.	Peter Martin, M.D.
Dan Landau, M.D, Ph.D.	Lewis Cantley, Ph.D.

Summer Picnic

With busy summer schedules on the horizon, Dr. Cantley and the Administration Team took time out to celebrate the efforts and accomplishments of the cancer center's Senior Leadership Team, Research Program Leaders, and all of its members by hosting a luau-themed summer picnic.



Hot dogs, hamburgers and assorted picnic snacks were served in recognition of the faculty achievements and developments made throughout the year. Attendees received raffle tickets for participating and enjoyed live music performed by Weill Cornell Medicine's Music and Medicine initiative.

Shared Research Resources

The MCC continues to partner with WCM's Core Laboratories Center (CLC) to establish new shared research resources and enhance existing CLC resources utilized by MCC members. **Barry Sleckman, M.D., Ph.D.**, Associate Director of Shared Resources, provides key input and oversight for these shared resources, or "cores."

Institutional Biobank

The collection, processing, storage, and distribution of human solid tissue and biofluid specimens is an integral component of cancer research and precision medicine efforts. The MCC-supported Institutional Biobank ensures procurement of high quality biospecimens, compliance with regulatory guidelines, maximization of biospecimen utility, and equitable access to biospecimens for investigators across participating groups. This past year, the biobank streamlined processes and established objectives for future years. The number of cancer—and non-cancer—research groups utilizing this resource continues to grow, making this a highly valuable institutional resource.

PDX Shared Resource

The MCC's Patient-Derived Xenograft (PDX) Shared Resource continues to be on the forefront of generating new mouse models that closely resemble human cancers. These models are especially important for genomic and pre-clinical functional studies and drug discovery. Led by **Giorgio Inghirami, M.D.**, the resource offers a number of mouse models, including rare models in T-cell lymphoma and developing models in prostate cancer, that are sought after by other academic institutions and industry.

Mass Spectrometry, Proteomics and Metabolomics Core

The Mass Spectrometry, Proteomics and Metabolomics Core offers services in protein identification, protein quantification, post-translational modification analysis, MS data analysis and metabolite quantification. Within the past year, the MCC-established core

was approved as an WCM CLC core to provide standardized access to the wider WCM research community. The core continues to be led by **Guoan Zhang, Ph.D.**, who with his colleagues facilitates the characterization and quantification of proteins and metabolites to assess the dynamic behavior of cancer cells.

Oncology Preclinical Pharmacy

The Preclinical Pharmacy was created to maintain commercial and experimental compounds for research purposes, including high-throughput drug screenings. To further this mission, MCC has partnered with the Englander Institute for Precision Medicine (EIPM) for the pharmacy to become an integral part of the EIPM pipeline. This will combine existing services with the expertise of EIPM for a more efficient high-throughput screening process and comprehensive cancer research resource.

Awards

- **Jessica Tyler, Ph.D.**, was one of 396 scientists elected this year as fellows of the American Association for the Advancement of Science (AAAS), the world's largest general scientific society. Dr. Tyler was honored for her contributions to the field of epigenetics. Her research has illuminated the genetic and molecular underpinnings of epigenetic regulation of genome activity and aging.
- **Dan A. Landau, M.D., Ph.D.**, received the 2017 Joanne Levy, M.D., Memorial Award for Outstanding Achievement from the American Society of Hematology (ASH). The award is presented to the current ASH Scholar with the highest-scoring abstract for the ASH Annual Meeting, as determined by the appointed abstract reviewers.
- **Lewis C. Cantley, Ph.D.**, the Meyer Director of the MCC, was inducted into the *OncLive®* 2017 Giants of Cancer Care® recognition program on June 1. He was among 12 respected healthcare professionals recognized for advancing the field of oncology by their contributions in research and clinical practice.
- **Samie Jaffrey, M.D., Ph.D.**, received the 2017 John J. Abel Award in Pharmacology from the American Society for Pharmacology and Experimental Therapeutics, an award made for outstanding research in the field of pharmacology and/or experimental therapeutics.
- **Ana Gomes, Ph.D.**, postdoctoral fellow in the **John Blenis, Ph.D.**, lab was selected as a 2017 STAT Wunderkind for her research on a chemical, found more prominently in older people than young, that potentially accelerates tumor growth.
- **Brendon M. Stiles, M.D.**, was named as the Chair of the Board of Directors of the Lung Cancer Research Foundation, a nonprofit dedicated to improving lung cancer outcomes through funding research.

- **Lewis C. Cantley, Ph.D.**, was elected as Chair of the Board of Trustees of the Hope Funds for Cancer Research, a charity dedicated to advancing innovative research for the most difficult-to-treat cancers.

Coordinated Care

Patients treated at NewYork-Presbyterian/Weill Cornell have access to a host of medical services that enhance and complement their cancer care. That care will be more coordinated, as part of a new delivery model.

We were selected by the Centers for Medicare & Medicaid Services (CMS) to participate in a national Oncology Care Model, which encourages practices to improve care and lower costs through episode- and performance-based payments.

In 2017, nationally registered clinical trials available to patients at MCC increased by 25%. Approximately 29% of these trials were initiated by Weill Cornell, another academic institution, and/or the National Institutes of Health. The majority of these trials are in breast, blood, and gastrointestinal (GI) cancers.

This year also brought many other noteworthy clinical advances:

- **Olivier Elemento, Ph.D.**, developed and validated a computational method for identifying optimal drug combinations to enhance single drug treatments. This method was further developed with **Ari Melnick, M.D.**, and **Leandro Cerchietti, Ph.D.**, to explore effective combination therapies for B cell lymphoma.
- The results of a study by **Tessa Cigler, M.D.**, that found a scalp cooling device used to prevent chemotherapy-induced alopecia among women with breast cancer to be associated with less hair loss were published.
- Through investigation into a nationwide oncology outcomes database, **Himanshu Nagar, M.D.**, found that postoperative radiotherapy improved survival for lung cancer patients.
- **Doug Scherr, M.D.**, **Chris Barbieri, M.D., Ph.D.**, and **Mark Rubin, M.D.**, examined urinary biomarkers for prostate cancer for different racial groups. They found that clinical utility was not the same across the groups, calling for biomarkers that can be established across diverse groups.
- Further evidence for a potential therapeutic target Burkitt lymphoma was found by **Ethel Cesarman, Ph.D.**, and **Lisa Roth, M.D.**

- Clinical outcomes for intraoperative Cs brachytherapy were investigated by **Gabrielle Wernicke, M.D., Bupesh Parashar, M.D., Rohan Ramakrishna, M.D., Susan Pannullo, M.D., and Theodore Schwartz, M.D.** The study team found that this is a promising and effective therapy for large brain metastases requiring neurosurgery.
- The TAXYNERGY trial, which originated from the work of **Evi Giannakakou, Ph.D., David Nanus, M.D., and Scott Tagawa, M.D.,** showed that a new taxane strategy improved PSA response rates in prostate cancer patients. This may serve as early biomarker for patient treatment.

Philanthropy

Private philanthropy is critical to driving the kind of exploratory scientific research necessary to take cancer patients into a new era of healing. Weill Cornell Medicine and the Meyer Cancer Center continued to enjoy robust support from generous donors in 2017. Philanthropic gifts and commitments to support cancer initiatives totaled in excess of \$19 million, including a notable gift of \$5 million to establish the WorldQuant Initiative for Quantitative Prediction, a collaborative effort between the Meyer Cancer Center and the Englander Institute for Precision Medicine. Our clinicians are often our greatest ambassadors, and with their help, several new gifts were received to fund endowments. A \$1 million gift established a Research Scholar Award in Lymphoma, and a gift of \$3 million established a new Professorship in Pancreatic Cancer Surgery.

Sharing Discovery

The Meyer Cancer Center Subcommittee, a group of internal and external stakeholders, convened twice in 2017 featuring presentations from several of the Cancer Center's distinguished faculty. In May, **John Babich, Ph.D.,** Professor of Radiopharmaceutical Sciences in Radiology, and **Ching Tung, Ph.D.,** Professor of Chemistry in Radiology, co-presented on the development of novel molecular imaging tools for medical diagnostics and therapeutics, titled "Seeing is Believing: New Tools for Visualizing Cancers". In October, **Olivier Elemento, Ph.D.,** Director of the Caryl and Israel Englander Institute for Precision Medicine, along with **Manish Shah, M.D.,** Bartlett Family Associate Professor of Gastrointestinal Oncology, co-presented "Beyond Genomics....building a novel platform for personalized therapy selection," which featured their research that was published in *Cancer Discovery* on the development of a robust precision cancer care platform that promotes discovery of novel therapeutic approaches to enable personalized treatment for patients when standard clinical options have been exhausted.

Building on the success of last year's small group Discovery Luncheon Series, four Discovery Luncheons were held in 2017. These informal and intimate lunch gatherings highlight innovative bench-to-bedside research collaborations between physician scientists and laboratory-based investigators. In March, **Scott Tagawa, M.D., M.S.,** the

Richard A. Stratton Associate Professor in Hematology and Oncology, and **Neil Bander, M.D.**, the Bernard and Josephine Chaus Professor of Urological Oncology and the Director of Urologic Oncology Research, shared their research on using nuclear and molecular medicine to improve diagnostic and therapeutic options facing prostate cancer patients. In June, **David Nanus, M.D.**, Chief of the Division of Hematology and Medical Oncology and MCC Associate Director for Clinical Services, co-presented with **Evi Giannakakou, Ph.D.**, Professor of Pharmacology in Medicine, on the molecular analysis and identification of novel drugs for prostate cancer. In October, **Douglas Scherr, M.D.**, Professor of Urology and Clinical Director of Urologic Oncology, and **Juan Cubillos-Ruiz, Ph.D.**, Professor of Immunology, highlighted their collaboration in the application of immunotherapy for the management of bladder cancer. In November, **Peter Schlegel, M.D.**, the James J. Colt Professor of Urology and Chair of the Department of Urology, along with **Tim McClure, M.D.**, Assistant Professor of Urology, presented on image guided therapies and focal therapy treatment of prostate cancer. This year's Discovery Lunches resulted in over \$500,000 in new philanthropic commitments to support these research initiatives.

Funding Future Innovation

A fundraising effort was initiated in summer of 2017 to create a reservoir of stable funding from which CRI Awards will be granted. To launch the Collaborative Research Initiative, the Meyer Cancer Center provided up to \$500,000 in matching funds.

Future Direction

In summary, there have been significant advances in the organization and productivity of the Meyer Cancer Center that continue to fulfill the Director's vision. By strengthening our infrastructure and support for our membership, we will maintain an impressive trajectory in cancer research and clinical care.

In the coming year, the Meyer Cancer Center will continue to focus on expanding expertise – basic research, clinical care and translational research – in thoracic oncology, breast oncology and tumor immunology. A new chief for the Division of Hematology and Medical Oncology will be an important partner in attracting thought leaders in each of these areas, and we will work closely with the new WCM Department of Medicine Chair to attract the strongest candidate.

One of the defining features of the Meyer Cancer Center is a research program structure that reflects our strongest basic, translational and clinical research while capturing our maximum extramural funding base. Through the Collaborative Research Initiative, we will continue funding innovative research projects to make them competitive for external funding. This will further expand the number of peer-reviewed research grants – both individual and multi-investigator – within each research program. Clinical Disease Management Teams (DMTs), a critical clinical interface with the Research Programs, were established in 2017 in collaboration with NYP; in 2018, these

DMTs will enhance the ability to initiate clinical trials emanating from scientific discoveries in the research programs.

Defining the Meyer Cancer Center catchment area – the geographic area and population that the cancer center serves – has been an ongoing priority that will continue in 2018. NCI-designated cancer centers are charged with decreasing cancer incidence and mortality among populations within their catchment areas, including minority and underserved populations. The Meyer Cancer Center has a unique opportunity to partner with our colleagues at both NYP/Queens and NYP/Brooklyn Methodist to identify the cancer problems in those boroughs that overlap with our strong basic, translational and clinical research.

One of the key components in serving the Meyer Cancer Center's catchment area is accruing patients of all demographics to clinical trials. The partnership with NYP/Queens and NYP/Brooklyn Methodist will also establish a robust clinical trials infrastructure and recruit clinicians to enhance our culture of patient care. To facilitate accruals to relevant clinical studies, we have begun working with the Cornell Center for Health Equity to develop community education and outreach programs that will be implemented in 2018.

Finally, the growth and development of the Meyer Cancer Center will depend upon the guidance of individuals with experience evaluating NCI designated cancer centers. The Meyer Cancer Center leadership will identify nationally recognized academic cancer experts to participate on an External Scientific Advisory Board, with plans for a formal review meeting in early 2019. These individuals will provide advice on institutional commitment policies, planning & evaluation activities, catchment area definition, research program metrics, shared resource usage, clinical trial portfolio balance and educational/outreach programs.