THE HALLMARKS OF CANCER SYMPOSIUM  
OCT. 19–20, 2015 • BioScience Research Collaborative Auditorium, Room 103

Monday, Oct. 19, 2015

6:30 p.m.  DINNER—Host and Invited Speakers  
Genesis Steakhouse and Wine Bar  
5427 Bissonnet St., Suite 400, Houston, Texas, 77081, 713-665-2222

Tuesday, Oct. 20, 2015

7 – 8 a.m.  REGISTRATION and BREAKFAST  
INTRODUCTION  
Sendurai A. Mani, MD Anderson Cancer Center

8:05 – 8:10 a.m.  WELCOME  
Robert A. Weinberg, Whitehead Institute

8:10 – 9 a.m.  “Inherited P53 Mutations in Humans and Mice”  
Arnold Levine, Institute for Advanced Study

9 – 9:50 a.m.  “Role of Autophagy in Cancer Metabolism”  
Eileen White, Rutgers Cancer Institute of New Jersey

9:50 – 10:40 a.m.  “Targeting the Limitless Proliferation of Cancer Cells”  
Jerry Shay, UT Southwestern Medical Center

10:40 – 11 a.m.  BREAK

11 – 11:50 a.m.  “Interconnected Function and Regulation of Angiogenesis and Immunity in Cancer”  
Gabriele Bergers, University of California, San Francisco

11:50 a.m. – 12:40 p.m.  “Stem Cells: Cancer and Normal”  
Robert A. Weinberg, Whitehead Institute

12:40 – 2 p.m.  LUNCH and POSTER SESSION  
BRC Event/Exhibition Hall, Room 120

2 – 2:50 p.m.  “Targeted Protein Degradation”  
James Bradner, Dana-Farber/Harvard Cancer Center

Reuben Shaw, Salk Institute for Biological Studies

3:40 – 4 p.m.  BREAK

4 – 4:50 p.m.  “Hybrid Epithelial-mesenchymal Cells — A Modeling Perspective”  
Herbert Levine, Rice University

4:50 – 5:40 p.m.  “Genomic Determinants of Response and Resistance to Cancer Therapy”  
Levi Garraway, Dana-Farber/Harvard Cancer Center and Broad Institute

5:40 – 5:50 p.m.  CONCLUSION

6 – 7 p.m.  RECEPTION  
BRC Event/Exhibition Hall, Room 120

7:30 p.m.  DINNER—Host and Invited Speakers  
Prego  
2520 Amherst St., Houston, Texas, 77005, 713-529-2420
Arnold J. Levine
Professor Emeritus, Institute for Advanced Study
Professor, Rutgers Cancer Institute of New Jersey

A world-renowned cancer biologist, Arnold J. Levine is best known for his 1979 discovery of the tumor suppressor gene p53, a molecule that inhibits tumor development. His group elucidated the functions of this gene and its role in viral mediated cancers, and his research has fueled the design of a new generation of anti-cancer therapies. Levine’s current research focuses on studying the relationship between p53 mutations and breast cancer stem cells. Using RNA microarrays, he identified the stem cell signatures of breast cancers with p53 mutations. These observations have been confirmed with several other cancers as well. He is currently developing a diagnostic tool to identify breast cancers with poor prognostic outcome. This may serve as a biomarker and help identify appropriate drug treatments for a specific tumor.

Eileen White
Associate Director for Basic Science, Rutgers Cancer Institute of New Jersey

As a staff investigator at Cold Spring Harbor Laboratory, Eileen White discovered that one of the oncogenes of the DNA tumor virus adenovirus encoded an inhibitor of programmed cell death or apoptosis (E1B 19K) that this gene was a viral homologue of the human bcl-2 oncogene. She went on to establish that oncogene activation that deregulates cell growth also activates apoptosis and that coordinate inhibition of apoptosis is an important function that promotes cancer. These findings revealed roles for the p53 tumor suppressor in activating apoptosis and suppressing cancer and for the Bcl-2-related anti-apoptotic proteins blocking apoptosis and promoting cancer.

White continued her work defining the role and mechanisms of apoptosis regulation in cancer at Rutgers University, where she is currently the associate director for Basic Science at the Rutgers Cancer Institute of New Jersey, an NCI-designated Comprehensive Cancer Center, and is also a distinguished professor of molecular biology and biochemistry.

White has served on the board of Scientific Counselors of the National Cancer Institute and other review panels for the National Institutes of Health. She is the recipient of numerous awards, including a MERIT award from the National Cancer Institute, the Red Smith award from the Damon Runyon Cancer Research Foundation, a Howard Hughes Medical Institute Investigatorship, an Achievement Award from the International Cell Death Society and a Career Award for the European Cell Death Organization and is an elected fellow of the American Society of Microbiology and the American Association for the Advancement of Science. White also has served as a member of the board of directors of the American Association for Cancer Research, the Scientific Review Boards for the Starr Cancer Consortium, the Damon Runyon Cancer Research Foundation and the Cancer Prevention Research Institute of Texas.

White’s current research is focused on determining the role of the catabolic process of autophagy in protein and organelle homeostasis and how this recycling of cellular components sustains cancer metabolism and tumorigenesis.
Gabriele Bergers
Professor, Departments of Neurological Surgery and Anatomy
Principal Investigator, Brain Tumor Research Center
Neill. H. and Linda S. Brownstein Chair, Brain Tumor Research, University of California, San Francisco

Gabriele Berger is an internationally recognized scientist who brings over 17 years of experience in the field of tumor angiogenesis and mouse models of carcinogenesis. Her laboratory has made seminal discoveries regarding both the interactions among tumor cells, the vasculature, and inflammatory cell constituents in regulating neovascularization and invasion in various transgenic and orthotopic mouse models of cancer and in revealing and understanding adaptation mechanisms of tumors during the course of antiangiogenic therapy. She began working on angiogenic and invasive properties in brain tumor mouse models 10 years ago when she joined the Department of Neurosurgery at UCSF. During this period, she actively collaborated with various investigators, including William Weiss, who is a project leader on the present U54 grant proposal, resulting in several peer-reviewed publications.

Currently, Bergers is the project leader on two NIH-sponsored R01s investigating a novel stem cell population with mesenchymal and epithelial characteristics in pancreatic tumors and studying of evasion to antiangiogenic therapy in various tumor types including glioblastoma. She has received numerous awards, including the prestigious Sidney Kimmel Award and Sandler Opportunity Award. Bergers has been serving on the NIH Tumor Microenvironment Study Section since 2006 and became chair in 2010. Moreover, she has served as an external advisory board member for various universities and pharmaceutical companies, including Amgen and Pfizer. She is a current external advisory board member for the CHLA/USC Childhood Brain Tumor Group in Los Angeles and the Max-Planck-Institute for Biomedicine (vascular biology focus) in Muenster, Germany.

Herbert Levine
Karl F. Hasselmann Professor of Engineering, Professor of Physics and Astronomy and Biochemistry and Cell Biology
Co-director, Center for Theoretical Biological Physics
Rice University

Herbert Levine is a professor in the bioengineering and physics departments at Rice University. He is also co-director of the Center for Theoretical Biological Physics, a National Science Foundation Physics Frontier Center devoted to applying concepts and methods from physical science to complex biological and biomedical problems. He also is coordinator of an international research network of researchers in the Physics of Living Systems, under the auspices of the NSF Science Across Virtual Institutes initiative.

Levine did his undergraduate work at MIT and received his Ph.D. in physics from Princeton University in 1979. After a postdoctoral fellowship at Harvard and a position on the research staff of the corporate research lab of Schlumberger Inc., he was appointed in 1987 to the faculty at the University of California, San Diego. He rose to the ranks of distinguished professor before leaving in 2012 to accept his new post at Rice. He is an elected member of the National Academy of Sciences and a fellow of the American Academy of Arts and Sciences.
James E. Bradner
Physician-Scientist, Department of Medical Oncology, Dana-Farber Cancer Institute
Associate Professor, Department of Medicine, Harvard Medical School

James E. Bradner joined the research faculty of Dana-Farber in 2008 and serves as associate director for the Science of Therapeutics. The research focus of the Bradner laboratory concerns the chemical modulation of chromatin structure and function. The clinical objective of the Bradner group is to deliver novel cancer therapeutics for human clinical investigation. Bradner’s awards and honors include the Damon Runyon-Rachleff Innovation Award, the Smith Family Award for Excellence in Biomedical Research, the Dunkin Donuts Rising Star Award and the HMS Distinguished Excellence in Teaching Award. He was elected into the American Society of Clinical Investigation in 2011 and the Alpha Omega Alpha medical society in 2013. His recent research has been published in Nature, Cell, Nature Chemical Biology and the Journal of the American Chemical Society. He has authored more than 30 U.S. Patent applications and is a scientific founder of Acetylon Pharmaceuticals, SHAPE Pharmaceuticals, Tensha Therapeutics and Syros Pharmaceuticals.

Three first-in-class molecules arising from his research are presently studied in open Phase I and Phase II clinical trials. Bradner also serves on the board of directors for the Leukemia and Lymphoma Society and the American Society of Hematology.

Jerry W. Shay
Vice Chairman, Department of Cell Biology, University of Texas Southwestern Medical Center
Associate Director, Harold Simmons NCI Comprehensive Cancer Center

Jerry W. Shay holds the Southland Corporation Distinguished Chair in Geriatrics Research. He also is the program director of the Cancer Biology Graduate Program at UT Southwestern and holds the title of Distinguish Teaching Professor. In 2012, he was awarded a University of Texas Regent’s Outstanding Teaching Award, and in 2013 the Minnie Stevens Piper Foundation Professor Award.

Shay’s group was the first to demonstrate that telomerase (hTERT) was upregulated in the vast majority of human tumors. Later he demonstrated that ectopically introduced hTERT expression in normal cells was sufficient to immortalize cells without leading to cell transformation. Along with fellow principal investigator Woodring Wright, the Shay/Wright blended labs are interested in the relationships between aging and cancer and have focused on the role of the telomeres and telomerase in these processes. A major contribution has been the "bench to bedside" development of telomerase inhibitors that are now in advanced cancer clinical trials. The team is currently testing a novel telomerase dependent telomere uncapping small molecule, identifying methods to alter telomerase splicing in cancer cells and investigating human diseases of telomere dysfunction (called telomeropathies) which are an emerging genetic spectrum disorder. In addition, they are moving a novel targeted therapeutic approach for colon cancer into the clinic and are involved in human cell and tissue engineering projects.
Levi Garraway
Associate Professor of Medicine, Dana-Farber Cancer Institute, Harvard Medical School
Director, Joint Center for Cancer Precision Medicine

Levi Garraway is an associate professor of medicine in the Department of Medical Oncology at the Dana-Farber Cancer Institute, Harvard Medical School, and an institute member of the Broad Institute. He is the inaugural director of the Joint Center for Cancer Precision Medicine at the Dana-Farber Cancer Institute, Brigham and Women’s Hospital, and the Broad Institute, and co-director of the Cancer Genetics Program at the Dana-Farber/Harvard Cancer Center.

Garraway has made seminal research contributions in cancer genomics, drug resistance and cancer precision medicine. He published seminal genome sequencing studies of prostate cancer, melanoma and other cancer types. This work has identified multiple new cancer genes and several fundamental mechanisms by which cancer may arise. He also was the first to describe ways in which BRAF-mutant melanoma becomes resistant to several new-targeted therapies, especially RAF and MEK inhibition. His contributions in this area have informed a conceptual framework for understanding resistance mechanisms relevant to many tumor types and identified novel therapeutic avenues for future cancer clinical trials.

Garraway has made key contributions to precision cancer medicine. He described the first high-throughput adaptation of genomic technology to profile human tumors for hundreds of cancer gene mutations that could guide therapeutic choices. This research has guided precision medicine initiatives at many cancer centers worldwide. It also inspired the launch of Foundation Medicine, Inc., a genomics-based cancer diagnostics company co-founded by Garraway.

Reuben J. Shaw
Professor, Molecular and Cell Biology Laboratory
Deputy Director, Salk Institute NCI Cancer Center, Salk Institute for Biological Studies

Reuben Shaw is a full professor in the Molecular and Cellular Biology Laboratory at the Salk Institute. Shaw’s lab focuses on the AMPK signaling pathway, which coordinates metabolism and growth at the cellular and organismal levels across eukaryotes. This pathway is inactivated in many human cancers and altered in metabolic diseases as well.

After getting his bachelor’s degree at Cornell University, Shaw completed his Ph.D. at MIT in the laboratory of Tyler Jacks. His postdoctoral research was performed at Harvard Medical School with Lewis Cantley, where Shaw discovered an unexpected direct connection between cancer and metabolism.

Shaw’s own lab at the Salk Institute has been using a combination of biochemistry, cell biology and genetically engineered mouse models of cancer to dissect the role of the LKB1–AMPK tumor suppressor pathway in coordinating metabolism, autophagy and cell growth since 2006. This work has led to the identification of a number of new direct substrates of AMPK, which provide a molecular basis for how cells reprogram their metabolism and growth under conditions of low nutrient. Shaw’s lab also utilizes genetic engineered mouse models to explore the roles that reprogramming of glucose and lipid metabolism contributes to tumorigenesis and to develop and test novel therapeutic approaches for multiple cancer types.

Shaw was named a V Foundation for Cancer Research Scholar, as well as receiving young investigator awards from both the American Cancer Society and the American Diabetes Association. In 2009, he was named a Howard Hughes Medical Institute Early Career Scientist. In 2014, he was named the deputy director of the NCI-funded Salk Institute Cancer Center.
Robert A. Weinberg is a founding member of the Whitehead Institute for Biomedical Research. He is an internationally recognized authority on the genetic basis of human cancer. Weinberg and his colleagues isolated the first human cancer-causing gene, the ras oncogene, and the first known tumor suppressor gene, Rb, the retinoblastoma gene. The principal goal of his research program is to determine how oncogenes, their normal counterparts (proto-oncogenes), and tumor suppressor genes fit together in the complex circuitry that controls cell growth.

More recently, his group has succeeded in creating the first genetically defined human cancer cells. He is particularly interested in applying this knowledge to improve the diagnosis and treatment of breast cancer.

Weinberg is the author or editor of six books and more than 420 articles. He has written a comprehensive cancer textbook titled “The Biology of Cancer.” His other books, intended for a lay audience, are “One Renegade Cell,” “Racing to the Beginning of the Road: The Search for the Origin of Cancer” and “Genes and the Biology of Cancer,” co-authored with Harold E. Varmus, former director of the National Institutes of Health.

Weinberg is an elected member of the U.S. National Academy of Sciences and fellow of the American Academy of Arts and Sciences. He is a member of the American Philosophical Society and the Institute of Medicine.

Symposium Organizers:

Robert A. Weinberg
Whitehead Institute/MIT
(pictured above)

Sendurai A. Mani
Associate Professor
Dept. of Translational Molecular Pathology
Co-director, Metastasis Research Center
Co-director, Center for Stem Cell & Developmental Biology
MD Anderson Cancer Center

Coordinators:

Lisa Bennett
Rice University

Christine Hickey
Whitehead Institute/MIT

Sponsors: