Under the leadership of Margaret Foti, Ph.D., M.D. (h.c.), CEO of the American Association for Cancer Research (AACR), and Paul A. Bunn Jr., M.D., executive director of the International Association for the Study of Lung Cancer (IASLC), this jointly organized third conference on the Molecular Origins of Lung Cancer: Biology to Therapy, continued the series after successful conferences in 2010 and 2012. The 2014 conference brought together a diverse group of attendees (physicians, patient advocates, and scientists in basic, translational, and clinical research) and provided a venue to discuss recent advances and establish new collaborations. As in past conferences, sessions ranged in topics spanning prevention, early detection, cancer stem cells, genomics, epigenetics, novel therapeutics, clinical trials, and patient advocacy. This conference is not only a dynamic collaboration of the AACR and the IASLC, two organizations committed to the study of cancer, but also a dynamic collaboration of the many individuals charged with the study and treatment of this disease.

Conference Co-Chairpersons
Elisabeth M. P. Brambilla, INSERM U823 – CHU Grenoble, Grenoble, France
Roy S. Herbst, Yale Cancer Center, New Haven, CT
Pasi A. Jänne, Dana-Farber Cancer Institute, Boston, MA
William Pao, Vanderbilt University, Nashville, TN

Program Committee
Denise R. Aberle, University of California, Los Angeles, CA
Bonnie J. Addario, Bonnie J. Addario Lung Cancer Foundation, San Carlos, CA
Paul A. Bunn, Jr., University of Colorado Denver, Aurora, CO
Myung-Ju Ahn, Sungkyunkwan University Samsung Medical Center, Seoul, South Korea
Robert C. Doebele, University of Colorado Denver, Aurora, CO
Peter S. Hammerman, Dana-Farber Cancer Institute, Boston, MA
David H. Harpole, Duke University Medical Center, Durham, NC
John V. Heymach, The University of Texas MD Anderson Cancer Center, Houston, TX
Tony S. K. Mok, Chinese University of Hong Kong, Hong Kong, China
Katerina A. Politi, Yale Cancer Center, New Haven, CT
Garth Powis, Sanford-Burnham Medical Research Institute, La Jolla, CA
Elda Railey, Research Advocacy Network, Plano, TX
Charles M. Rudin, Memorial Sloan-Kettering Cancer Center, New York, NY
Alice T. Shaw, Massachusetts General Hospital Cancer Center, Boston, MA
Gabriella Sozzi, Istituto Nazionale dei Tumori, Milan, Italy
Avrum E. Spira, Boston University School of Medicine, Boston, MA
William C. Timmer, National Cancer Institute, Bethesda, MD
Ming-Sound Tsao, University of Toronto University Health Network, Toronto, ON, Canada
Seiji Yano, Kanazawa University Cancer Research Institute, Kanazawa, Japan
The AACR and the IASLC would like to thank the following organizations for their generous support of this conference.

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The AACR and the IASLC thank the following organizations for their generous support of the travel awards provided at this conference.

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Center to Reduce Cancer Health Disparities
Monday, January 6

6:00 p.m-7:30 p.m. **Opening Keynote Session**  
Legends 1-4  
*Session Co-Chairpersons: Elisabeth M. P. Brambilla, INSERM U823 - CHU Grenoble, Grenoble, France, and Roy S. Herbst, Yale Cancer Center, New Haven, CT*

6:00 p.m. **Welcome Remarks**  
Roy S. Herbst and Elisabeth M.P. Brambilla

6:15 p.m. **Keynote Address:**  
*Immunology of Anti-PD-1/PD-L1 Therapy in Lung Cancer*  
Lieping Chen, Yale University School of Medicine, New Haven, CT

7:00 p.m. **Keynote Discussion**

7:15 p.m. **Perspective**  
Kim Norris, Lung Cancer Foundation of America, Los Angeles, CA

7:30 p.m-9:00 p.m. **Welcome Reception**  
Woodstock
Tuesday, January 7

7:00 a.m.-8:00 a.m.  Continental Breakfast
The Edge

8:00 a.m.-10:00 a.m.  Plenary Session 1: New Findings in Small Cell Lung Cancer
Legends 1-4
Session Co-Chairpersons: Paul A. Bunn, Jr., University of Colorado Denver, Aurora, CO, and John D. Minna, UT Southwestern Medical Center, Dallas, TX

  8:00 a.m.  A drug-repositioning approach identifies tricyclic antidepressants as inhibitors of small cell lung cancer
Julien Sage, Stanford University School of Medicine, Stanford, CA

  8:25 a.m.  Genomic and epigenomic targets in small cell lung cancer
Charles Rudin, Memorial Sloan-Kettering Cancer Center, New York, NY

  8:50 a.m.  Decoding the genomic architecture of small cell lung cancer
Martin Peifer, University of Cologne, Department of Translational Genetics, Germany

  9:15 a.m.  Mouse models cancer: Heterogeneity and cell-of-origin of small cell and non-small cell lung cancer
Anton J. M. Berns, Netherlands Cancer Institute, Amsterdam, The Netherlands

  9:40 a.m.  Session Discussion

10:00 a.m.-10:30 a.m.  Break
Abbey Road
10:30 a.m-12:30 p.m.  Plenary Session 2: Clinical Trial Design and Master Protocols
Legends 1-4
Session Co-Chairpersons: William C. Timmer, National Cancer Institute, Bethesda, MD, and David Gandara, UC Davis Comprehensive Cancer Center, Sacramento, CA

10:30 a.m.  Innovative clinical trial designs for NSCLC: From BATTLE to master protocols
Roy S. Herbst, Yale Cancer Center, New Haven, CT

10:55 a.m.  Adaptive designs and adaptive learning for biomarker-based clinical trials for targeted therapies
J. Jack Lee, The University of Texas MD Anderson Cancer Center, Houston, TX

11:20 a.m.  Title to be announced
Fred R. Hirsch, University of Colorado Cancer Center, Denver, CO

11:45 a.m.  Clinical trial design and master protocols in NCI clinical treatment trials
Margaret Mooney, National Cancer Institute, Bethesda, MD

12:10 p.m.  Session Discussion

12:30 p.m-2:30 p.m.  Poster Session A with Lunch
Woodstock

2:30 p.m-4:30 p.m.  Concurrent Sessions 1-2

Concurrent Session 1: Pathology and Pathogenesis
Legends 1-4
Session Co-Chairpersons: Elisabeth M. P. Brambilla, INSERM U823 - CHU Grenoble, Grenoble, France, and Ming-Sound Tsao, University of Toronto University Health Network, Toronto, ON, Canada

2:30 p.m.  Squamous cell carcinoma: Pathology, etiology, and molecular drivers
Elisabeth M. P. Brambilla

2:55 p.m.  Molecular testing to personalize EGFR and ALK inhibitor therapies in lung cancer
Ming-Sound Tsao

3:20 p.m.  Promises and challenges of applying molecular profiles to lung cancer treatment and early diagnosis
Ignacio I. Wistuba, The University of Texas MD Anderson Cancer Center, Houston, TX

3:45 p.m.  Decoding the signaling circuitry of lung cancer through integrated genomics and proteomics
John V. Heymach, The University of Texas MD Anderson Cancer Center, Houston, TX

4:10 p.m.  Session Discussion
**Concurrent Session 2: RAS**

*Legends 5-6*

*Session Chairperson: Garth Powis, Sanford-Burnham Medical Research Institute, La Jolla, CA*

- **2:30 p.m.** Targeting MEK alone or in combination in KRAS mutant lung cancer  
  Pasi A. Jänne, Dana-Farber Cancer Institute, Boston, MA
- **2:55 p.m.** New approaches to targeting RAS  
  Tina Yuan, UCSF Helen Diller Family Comprehensive Cancer Center, San Francisco, CA
- **3:20 p.m.** Building combination therapy for KRAS-driven lung cancer  
  David Barbie, Dana-Farber Cancer Institute, Boston, MA
- **3:45 p.m.** Novel targets for attacking RAS  
  Garth Powis
- **4:10 p.m.** Session Discussion

**4:45 p.m.-6:45 p.m. Concurrent Sessions 3-4**

**Concurrent Session 3: Advances in Immunotherapy**

*Legends 1-4*

*Session Chairpersons: Roy S. Herbst, Yale Cancer Center, New Haven, CT*

- **4:45 p.m.** Oncology meets immunology: The cancer-immunity cycle and lung cancer  
  Daniel Chen, Genentech, Inc., South San Francisco, CA
- **5:10 p.m.** Early but promising data: PD-1 inhibitors in non-small cell lung cancer  
  Edward Garon, University of California, Los Angeles, CA
- **5:35 p.m.** Clinical development of PDL1 antibodies in lung cancer  
  Leora Horn, Vanderbilt-Ingram Cancer Center, Nashville, TN
- **6:00 p.m.** Future directions for immunotherapy in NSCLC: Early-stage disease, drug combinations, and immunological monitoring  
  Roy S. Herbst
- **6:25 p.m.** Session Discussion
Concurrent Session 4: Animal Models
Legends 5-6
Session Co-Chairpersons: Katerina A. Politi, Yale Cancer Center, New Haven, CT, and Kwok-Kin Wong, Dana-Farber Cancer Institute, Boston, MA

4:45 p.m. Linking tumor genomics to patient outcomes through a large scale patient derived xenograft (PDX) platform
David Gandara, UC Davis Comprehensive Cancer Center, Sacramento, CA

5:10 p.m. Developing a new functional classification of lung cancer based on tumor acquired vulnerabilities
John D. Minna, UT Southwestern Medical Center, Dallas, TX

5:35 p.m. Mechanisms of sensitivity and resistance to EGFR-directed therapies in lung cancer models
Katerina A. Politi

6:00 p.m. New genetic engineered mouse lung cancer models for pre- and co-clinical studies
Kwok-Kin Wong

6:25 p.m. Session Discussion

Wednesday, January 8

7:00 a.m.-8:00 a.m. Continental Breakfast
The Edge

8:00 a.m-10:00 a.m. Plenary Session 3: Lung Cancer Screening and Prevention
Legends 1-4
Session Co-Chairpersons: Denise R. Aberle, UCLA David Geffen School of Medicine, Los Angeles, CA, and Elda Railey, Research Advocacy Network, Plano, TX

8:00 a.m. Beyond efficacy: Implementing lung cancer screening
Denise R. Aberle, UCLA David Geffen School of Medicine, Los Angeles, CA

8:25 a.m. The management of screening-detected indeterminate pulmonary nodules
Pierre Massion, Vanderbilt University Medical Center, Nashville, TN

8:50 a.m. Title to be announced
Avrum Spira, Boston University School of Medicine, Boston, MA

9:15 a.m. Clinical utility of plasma-based microRNA signature classifier within computed tomography lung cancer screening
Gabriella Sozzi, Fondazione IRCCS Istituto Nazionale Tumori, Milan, Italy

9:40 a.m. Session Discussion
10:00 a.m-10:30 a.m. Break
Abbey Road

10:30 a.m-12:30 p.m. Plenary Session 4: EGFR Mutants in Lung Cancer: A 10-Year History
Legends 1-4
Session Co-Chairpersons: Pasi A. Jänne, Dana-Farber Cancer Institute, Boston, MA, and William Pao, Vanderbilt University, Nashville, TN

Our expert speakers in this 10-year anniversary session will highlight this important finding in the study of lung cancer genomics. Dr. Lynch will provide a historical overview of the past 10 years and Dr. Mok will comment on the impact this discovery has made in the research and treatment of lung cancer. Dr. Yano’s talk will discuss the mechanisms of resistance to EGFR TKI’s, while Dr. Pao will look ahead at new treatment strategies. The session will conclude with a discussion of the still unanswered questions we continue to research 10 years later.

10:30 a.m. Introduction
William Pao

10:35 a.m. EGFR mutated NSCLC: Response, resistance, and progress 10 years later
Thomas Lynch, Yale Cancer Center, New Haven, CT

11:00 a.m. EGFR mutants in lung cancer: A 10-year history
Tony S. K. Mok, Chinese University of Hong Kong, Hong Kong, China

11:25 a.m. Mechanisms of EGFR-TKI resistance in EGFR mutant lung cancer and its therapeutic strategy
Seiji Yano, Kanazawa University Cancer Research Institute, Kanazawa, Japan

11:50 a.m. New treatment strategies in EGFR mutant lung cancer
William Pao, Vanderbilt University, Nashville, TN

12:15 p.m. Session Discussion and Unanswered Questions in 2014
Pasi A. Jänne

12:30 p.m-2:30 p.m. Poster Session A with Lunch
Woodstock

2:30 p.m-3:50 p.m. Mid-Conference Keynote Session
Legends 1-4
Session Co-Chairpersons: Pasi A. Jänne, Dana-Farber Cancer Institute, Boston, MA, and William Pao, Vanderbilt University, Nashville, TN

2:30 p.m. Introduction

2:35 p.m. Somatic Alterations in Human Cancer Genomes
Matthew L. Meyerson, Dana-Farber Cancer Institute, Boston, MA

3:20 p.m. Keynote Discussion

3:35 p.m. Perspective
Natalie DiMarco, Penngrove, CA

AACR-IASLC Joint Conference on the Molecular Origins of Lung Cancer
3:50 p.m-4:30 p.m.  Patients Powering Progress and Providing Solutions

Session Chairpersons: Bonnie J. Addario, Bonnie J. Addario Lung Cancer Foundation, San Carlos, CA, and Elda Railey, Research Advocacy Network, Plano, TX

Speakers and Panelists:
Bonnie J. Addario
Emily Bennett Taylor, Woodland Hills, CA
Elda Railey
Pasi A. Jänne
William Pao

4:45 p.m-6:45 p.m.  Plenary Session 5: Mechanisms of Resistance

Session Co-Chairpersons: Robert C. Doebele, University of Colorado Denver, Aurora, CO, and Seiji Yano, Kanazawa University Cancer Research Institute, Kanazawa, Japan

4:45 p.m.  Mechanism-based targeted polytherapy to enhance responses in lung cancer
Trever Bivona, University of California, San Francisco, CA

5:10 p.m.  Overcoming resistance in ALK- and ROS1-positive NSCLC
Alice T. Shaw, Massachusetts General Hospital Cancer Center, Boston, MA

5:35 p.m.  Treatment strategies to overcome EGFR TKI resistance
Myung-Ju Ahn, Sungkyunkwan University Samsung Medical Center, Seoul, South Korea

6:00 p.m.  Title to be announced
Jeffrey Engelman, Massachusetts General Hospital, Boston, MA

6:25 p.m.  Session Discussion
Thursday, January 9

7:00 a.m.-8:00 a.m.  Continental Breakfast
The Edge

8:00 a.m-10:00 a.m.  Plenary Session 6: Proffered Talks from Highly Rated Abstracts
Legends 1-4
Session Co-Chairpersons: David H. Harpole, Duke University Medical Center, Durham, NC, and Alice Shaw, Massachusetts General Hospital Cancer Center, Boston, MA

8:00 a.m.  Comprehensive genomic characterization of lung adenocarcinoma by The Cancer Genome Atlas investigators (TCGA)
Eric Collisson, University of California, San Francisco, CA

8:15 a.m.  Recurrent oncogenic mutations in the small GTPase RIT1 activate PI3K and MEK
Alice H. Berger, Broad Institute, Cambridge, MA

8:30 a.m.  Targeting CREB-CBP transcription factor complex using small molecule inhibitors with multifunctional anticancer mechanisms
Jaseok Peter Koo, Yale School of Medicine, New Haven, CT

8:45 a.m.  Distinctive squamous cell carcinoma protein signatures
Rachel Ostroff, SomaLogic, Boulder, CO

9:00 a.m.  Identification of functionally relevant off-targets of tivantinib in lung cancer
Uwe Rix, H. Lee Moffitt Cancer Center & Research Institute, Tampa, FL

9:15 a.m.  The neurotrophin receptor TrkB promotes lung adenocarcinoma metastasis
Kerstin Sinkevicius, Boston Children’s Hospital, Boston, MA

9:30 a.m.  BRG1-inactivating mutations as potential predictive markers for Aurora kinase A-targeted therapy
Vural Tagal, University of Texas (UT) Southwestern Medical Center, Dallas, TX

9:45 a.m.  Pro-surfactant protein B as a biomarker for lung cancer prediction
Ayumu Taguchi, University of Texas MD Anderson Cancer Center, Houston, TX

10:00 a.m.-10:15 a.m.  Break
Abbey Road
10:15 a.m-12:15 p.m.  Plenary Session 7: Advances in Molecular Targets and Novel Pathway-Based Therapy
Legends 1-4
Session Co-Chairpersons: David P. Carbone, The Ohio State University Comprehensive Cancer Center, Columbus, OH, and Bruce E. Johnson, Dana-Farber Cancer Institute, Boston, MA

10:15 a.m.  LKB1 loss induces characteristic pathway activation in human tumors and confers sensitivity to MEK inhibition associated with decreased PI3K-Akt-FOXO3 signaling
David P. Carbone

10:40 a.m.  Squamous cell lung cancer 2014
Peter S. Hammerman, Dana-Farber Cancer Institute, Boston, MA

11:05 a.m.  Novel pathway-based therapy for non-small cell lung cancer
Bruce E. Johnson

11:30 a.m.  A new TRacK in lung cancer: NTRK1 gene fusions as a therapeutic target
Robert C. Doebele, University of Colorado School of Medicine, Aurora, CO

11:55 a.m.  Session Discussion

12:15 p.m.  Departure