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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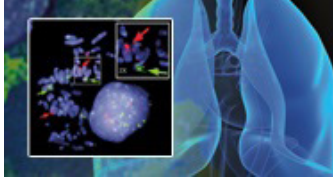## Exhibitor and Sponsorship of Conference Bags

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Conference Program

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 Disscussion**

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 Disscussion**

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 EFGR 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

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**
Legend 1-4
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**

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

10:40a.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**