Asthma affects people from childhood to old age and causes significant public health problems with great economic consequences. The type 2 inflammation pathway is considered the dominant mechanism of asthma, but clinical trials of recently developed treatments targeting this pathway indicate that large numbers of asthmatics do not benefit from this therapeutic approach. This limited effect of type 2 inhibitors, coupled with recent advances in our understanding of the clinical diversity of asthma, underscores the heterogeneous nature of the underlying disease mechanisms. The aims of this meeting are to focus on the heterogeneous disease biology of asthma and to explore how treatments can advance from a one-size-fits-all paradigm to one in which asthmatics receive personalized treatments based on biomarkers that classify their specific disease mechanism. The meeting program will combine cutting-edge presentations on the molecular mechanisms of inflammation and remodeling in asthma with others that address the complexity of clinical phenotypes of asthma, and will include updates on the application of new technologies to develop biomarkers to guide personalized treatment. Anticipated outcomes include greater understanding of mechanisms of disease other than type 2 inflammation and appreciation of the need to forge stronger collaborations between clinical and basic scientists to advance the goal of personalized asthma treatment. The overarching goal of the meeting is to bring together world-class researchers with expertise in immunology, cell biology and asthma disease biology to permit exchange of ideas and facilitate development of new scientific directions and therapeutic approaches for asthma.

Session Topics:
• Asthma: Progress, Pathogenesis and Phenotypes
• Workshop 1: Phenotyping Methods/Cluster Analysis
• Complex Phenotypes and How to Approach Them
• Regulation and Treatment of Type 2 Inflammation in the Airway
• Novel Pathways Underlying Complex Phenotypes of Asthma
• Influence of Pathogenic and Protective Microbes
• How does Tissue Remodeling Influence Disease Phenotype?
• Biomarkers for Personalized Treatment
• Workshop 2: Modeling Complex Diseases in vivo and in vitro
• Doing Better Going Forward

Scholarship Application & Discounted Abstract Deadline: October 13, 2016
Abstract Deadline: November 16, 2016
Discounted Registration Deadline: December 14, 2016

Note: Scholarships are available for graduate students and postdoctoral fellows and are awarded based on the abstract submitted.

Upper image of mouse trachea cells courtesy of Eva Mutunga and Kate Klein, University of the District of Columbia and National Institute of Standards and Technology, NIH

Meeting Hashtag: #KSasthma
www.keystonesymposia.org/17B3
**Asthma: Progress, Pathogenesis and Phenotypes**

Welcome and Keynote Address

- **Clare M. Lloyd**, Imperial College London, UK
- **Avrum Spira**, Boston University, USA
- **The Airway Transcriptome for Precision Lung Cancer Detection**

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**MONDAY, FEBRUARY 13**

**Session Chair † Invited but not yet accepted Program current as of March 5, 2020. Program subject to change. Meal formats are based on meeting venue. For the most up-to-date details, visit https://www.keystonesymposia.org.**

**Workshop 1: Phenotyping Methods/Cluster Analysis**

- **Lauren E. Cohn**, Yale University, USA
- **Anthony Bosco**, Telethon Kids Institute, Australia
- **Michael Peters**, University of California, San Francisco, USA
- **Marc Massanari**, Circassia, USA
- **Xiting Yan**, Yale University School of Medicine, USA
- **Samir Kelada**, University of North Carolina at Chapel Hill, USA

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**Asthma: Progress, Pathogenesis and Phenotypes**

- **Joseph R. Arron**, Genentech, Inc., USA
- **Wendy C. Moore**, Wake Forest School of Medicine, USA
- **John V. Fahy**, University of California, San Francisco, USA
- **Fernando D. Martinez**, University of Arizona, USA
- **Kedir N. Turi**, Vanderbilt University, USA
- **Zala Rojnik**, AstraZeneca, Sweden

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**Welcome and Keynote Address**

- For the most up-to-date details, visit https://www.keystonesymposia.org

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**TUESDAY, FEBRUARY 14**

**Poster Session 1**

- **Lauren E. Cohn**, Yale University, USA
- **Anthony Bosco**, Telethon Kids Institute, Australia
- **Michael Peters**, University of California, San Francisco, USA
- **Marc Massanari**, Circassia, USA
- **Xiting Yan**, Yale University School of Medicine, USA
- **Samir Kelada**, University of North Carolina at Chapel Hill, USA

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**Asthma: Progress, Pathogenesis and Phenotypes**

- **Sally Wenzel-Morganroth**, University of Pittsburgh, USA
- **Eric P. Xing**, Carnegie Mellon University, USA
- **Anne Dixon**, University of Vermont College of Medicine, USA
- **Sejal Saglani**, Imperial College London, UK
- **Kapil Gadkar**, Genentech, Inc., USA

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**Asthma: Progress, Pathogenesis and Phenotypes**

- **Johan Kolmert**, University of California, San Francisco, USA
- **Peter McErlean**, Kings College London, UK
- **Bruce D. Levy**, Brigham and Women's Hospital, USA
- **Irma Tindemans**, Erasmus MC, Netherlands
- **Rafael de Queiroz Prado**, NIAID, National Institutes of Health, USA
- **Carla V. Rothlin**, Yale University, USA

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**Complex Phenotypes and How to Approach Them**

- **Sally Wenzel-Morganroth**, University of Pittsburgh, USA
- **Eric P. Xing**, Carnegie Mellon University, USA
- **Anne Dixon**, University of Vermont College of Medicine, USA
- **Sejal Saglani**, Imperial College London, UK
- **Kapil Gadkar**, Genentech, Inc., USA

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**Complex Phenotypes and How to Approach Them**

- **Zala Rojnik**, AstraZeneca, Sweden
- **Lauren E. Cohn**, Yale University, USA
- **Anthony Bosco**, Telethon Kids Institute, Australia
- **Michael Peters**, University of California, San Francisco, USA
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- **Irma Tindemans**, Erasmus MC, Netherlands
- **Rafael de Queiroz Prado**, NIAID, National Institutes of Health, USA
- **Carla V. Rothlin**, Yale University, USA
**Poster Session 2**

**WEDNESDAY, FEBRUARY 15**

**Influence of Pathogenic and Protective Microbes**  
*Clare M. Lloyd*, Imperial College London, UK  
*Benjamin J. Marsland*, Monash University, Australia  
**Influence of the Microbiome on the Development of Asthma**  
*Anuradha Ray*, University of Pittsburgh School of Medicine, USA  
**Infections and Immune Responses Impacting Asthma Inception and Severity**  
*Nathan W. Bartlett*, University of Newcastle, Australia  
**Mechanisms of Virus Induced Exacerbations of Asthma**  
*Roland W. Kolbeck*, MedImmune, LLC, USA  
**Targeted Treatment of Inflammatory Mediators of Asthma**  
*Henry J. McSorley*, Queen's Medical Research Institute, UK  
**Short Talk: Using Microbial Composition within Sputum Transcriptome Data to Stratify Patients by Asthma Severity**  
*Daniel J. Spakowicz*, Yale University, USA

**How Does Tissue Remodeling Influence Disease Phenotype?**  
*Steve Georas*, University of Rochester Medical Center, USA  
*James G. Martin*, McGill University, Canada  
**Airway Smooth Muscle Hypercontraction in Asthma**  
*Jeffrey A. Whitsett*, Cincinnati Children's Hospital Medical Center, USA

**Poster Session 3**

**THURSDAY, FEBRUARY 16**

**Biomarkers for Personalized Treatment**  
*Roland W. Kolbeck*, MedImmune, LLC, USA  
*Joseph R. Arron*, Genentech, Inc., USA  
**The Virtuous Cycle: Biomarkers and Translational Research in Asthma Drug Development**  
*David Beebe*, University of Wisconsin, USA

**Workshop 2: Modeling Complex Diseases in vivo and in vitro**  
*Philip Hansbro*, University of Newcastle, Australia  
*Tibor Z. Veres*, NIAID, National Institutes of Health, USA  
**Allergen-Induced CD4+ T-Cell Cytokine Production within Airway Mucosal DC-T-Cell Clusters Drives the Local Recruitment of Myeloid Effector Cells**  
*Daniel Camacho*, University of Chicago, USA

**Doing Better Going Forward**  
*John V. Fahy*, University of California, San Francisco, USA  
*Clare M. Lloyd*, Imperial College London, UK  
**Transformative Treatments - How the Cystic Fibrosis Community Did It**  
*Jennifer Davidson Hamilton*, Regeneron Pharmaceuticals, Inc., USA  
**Targeted Therapeutics: What Have They Taught Us About Pathomechanisms in Asthma?**  
*Sally Wenzel-Morganroth*, University of Pittsburgh, USA

**Meeting Wrap-Up: Outcomes and Future Directions (Organizers)**

**FRIDAY, FEBRUARY 17**

Departure