Overview of EPA Multipollutant Science and Risk Analysis Workshop:

February 22-24, 2011, Chapel Hill, NC

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EPA/ORD/NCEA

Clean Air Centers Kick-off Meeting
April 8, 2011

Workshop Purpose

"…discuss [the] challenges, along with opportunities and future research needs related to multipollutant approaches for the evaluation of health risks associated with exposures to air pollution."

For the purpose of the workshop, we generally used Dan Greenbaum's definition of multipollutant: *"a discrete and perhaps manageable set of compounds (i.e., the criteria pollutants and a subset of priority air toxics)."*

Workshop Planning

- Joint effort between NCEA, OAQPS, ORD Labs, and HEI
  - Doug Johns, NCEA
  - Lindsay Stanek, NCEA
  - Bryan Hubbell, OAQPS
  - Bob Devlin, ORD
  - Katy Walker, HEI
- General discussions began in early 2010
- Related but distinct goals for OAQPS, NCEA, and ORD Labs
- Not intended to suggest potential development of multipollutant NAAQS

Workshop Organization

- Day 1 (OAQPS): Focus on the use of scientific information and statistical approaches in conducting air pollution risk analyses in multipollutant exposure environments
- Day 2 (NCEA): Focus on the interpretation and integration of information across scientific disciplines in developing a multipollutant science assessment to support the reviews of the NAAQS and the air quality criteria on which they are based, including consideration of available information on the criteria pollutants and other pollutant and non-pollutant stressors
- Day 3 (ORD): Focus on identification and discussion of novel research and analytical approaches to better characterize the health effects of multipollutant exposures

- **Discussions guided by a series of panel discussion questions (8-10 expert panelists for each session)**

Major Themes

- Partnership between investigators in different disciplines is essential
- Current tools and information are useful, but not sufficient
  - Single pollutant and multipollutant models
  - National monitoring networks and site-specific monitoring campaigns
  - Improving air quality modeling
  - Experimental mixture studies
  - Information on toxicological pathways
- Exciting time to be in this field
  - Emerging techniques and opportunity for innovation
  - Need to be practical
- "Multipollutant: Because single pollutant isn't quite complicated enough"

Workshop Follow-Up

Most frequently asked question:

"Did you get what you needed?"

- Workshop summary in development
- Continuing to develop conceptual framework for multipollutant risk assessment
- Major role in future research planning
- Development of a multipollutant science assessment

2004 NRC Report: "Air Quality Management in the United States"

Recommendation: Address multiple pollutants in the NAAQS review and standard setting process

"Although the committee does not believe that the science has evolved to a sufficient extent to permit the development of multipollutant NAAQS, it would be scientifically prudent to begin to review and develop NAAQS for related pollutants in parallel and simultaneously"

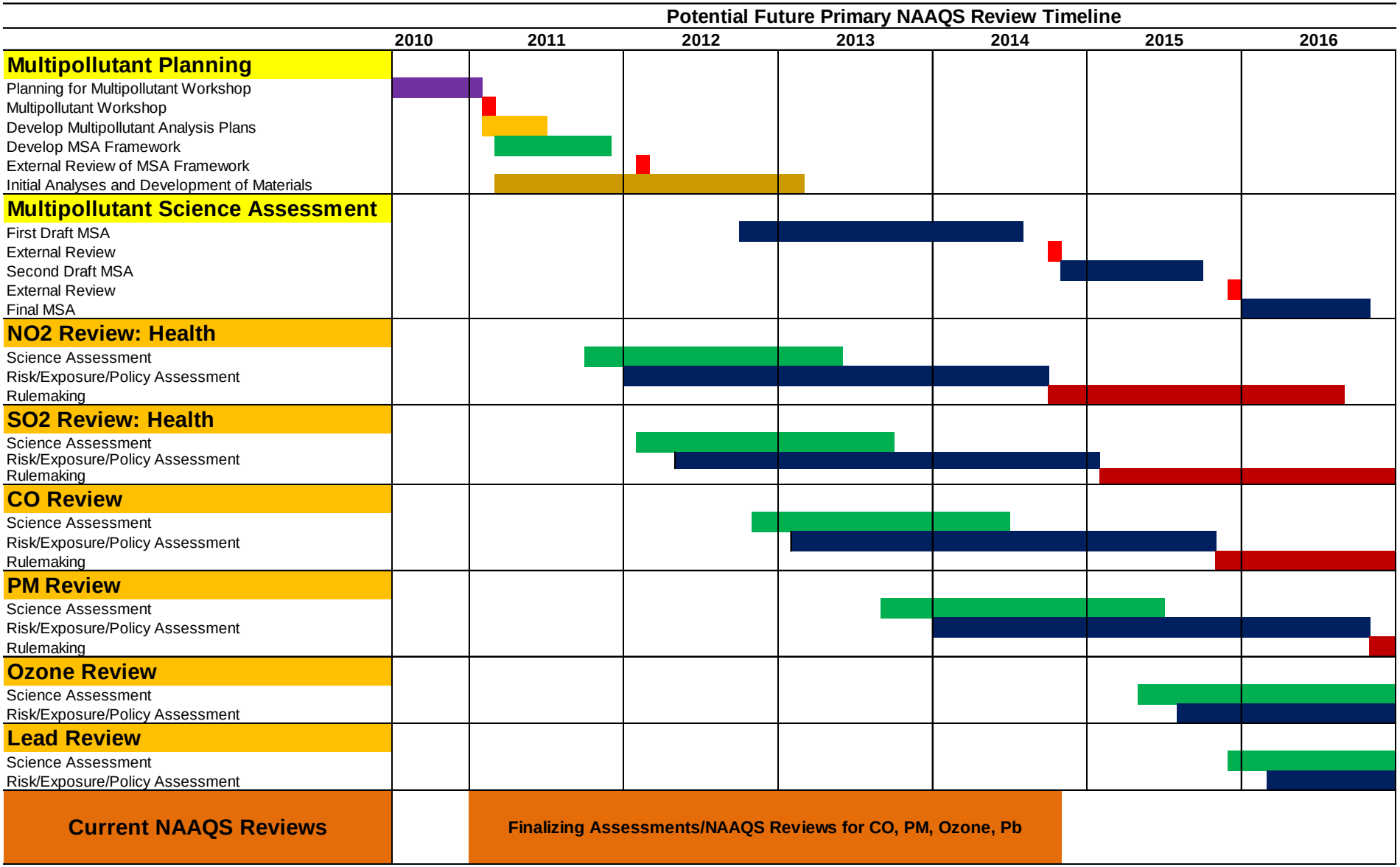
Multipollutant Science Assessment Concept Development

- Multipollutant Science Assessment development with dual focus:
  - Supporting NAAQS reviews
  - Developing multipollutant evaluation approaches
- Comprehensive assessment of the science
  - Similar to current ISAs, MSA will review and evaluate evidence from across scientific disciplines
  - Evaluation of various types of interactions using observational and experimental study information
  - Effective evaluation of health effects of exposure to combinations of pollutants **as well as single pollutants in a multipollutant context**

Timeline Considerations

- Need for sufficient time to develop multipollutant assessment
- CAA mandated 5-year NAAQS review cycle
- Considered (and rejected) plans
  - Replace ISAs with MSA?
  - Develop and finalize individual ISAs from draft MSA?
- Multipollutant Science Assessment (MSA) in conjunction with single-pollutant ISAs
  - Possible to develop MSA over a 5-6 year time period?
  - Parallel development of ISAs for individual pollutants to meet 5 year schedules
- First attempt likely to be a companion document to series of individual pollutant ISAs

Example Timeline of Multipollutant Assessment with Individual ISAs



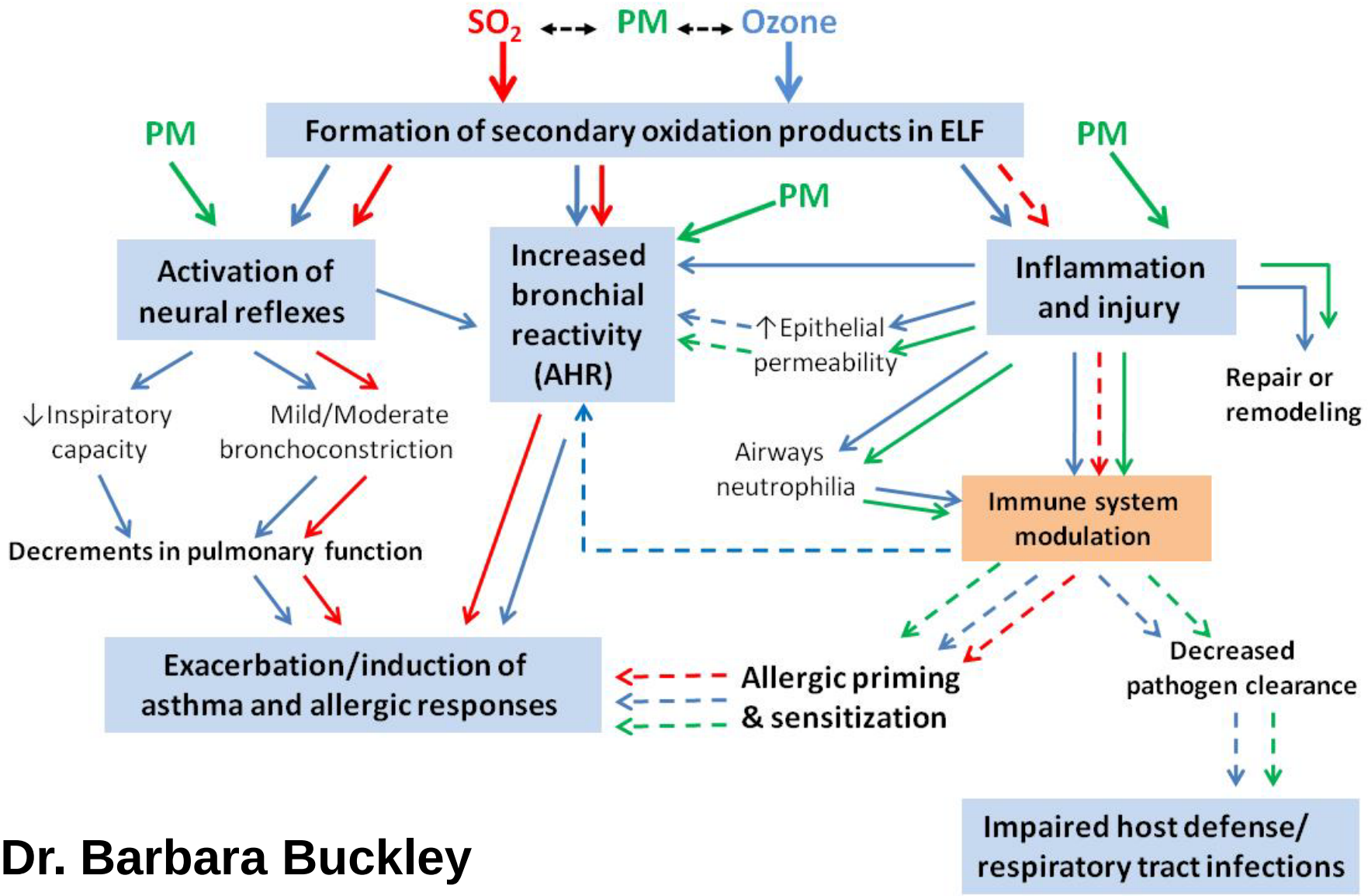
Next Steps

- Development of analysis plans: Late Summer 2011
  - Epidemiology (observational)
  - Toxicology (experimental)
  - Atmospheric and exposure science
- MSA framework: Winter 2011-2012
- Review of MSA framework: Spring 2012
- To the extent possible, incorporate multipollutant analyses and approaches into next round of ISAs
- Develop MSA with internal, external, and CASAC review

Examples of Potential Analyses and Approaches

- Epidemiology
  - Meta-regression analyses
  - Clustering approaches for estimating joint effects of air pollutant mixtures
  - (Identification of examples from existing literature)
  - (Results of new secondary data analyses)
- Toxicology
  - Mode of action framework
  - Evaluation of published mixture studies
- Atmospheric and exposure science
  - Review and development of multipollutant indicators
  - Identification of similarities and differences in multipollutant characteristics between cities

Multipollutant MOA: Respiratory Effects
Converging Pathways



Dr. Barbara Buckley

Multipollutant Workshop Website

http://epamulti.icfi.com/Home.aspx

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