

**State of California
AIR RESOURCES BOARD**

Resolution 01-21
June 28, 2001

Agenda Item No.: 01-5-6

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code sections 39700 through 39705;

WHEREAS, a research proposal, number 2496-220, entitled "Effects of Nitrogen Dioxide on Airway Inflammatory Responses in Allergic Asthmatic Subjects", has been submitted by the University of California, San Francisco;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

Proposal Number 2496-220 entitled "Effects of Nitrogen Dioxide on Airway Inflammatory Responses in Allergic Asthmatic Subjects", submitted by the University of California, San Francisco, for a total amount not to exceed \$248,127.

NOW, THEREFORE BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

Proposal Number 2496-220 entitled "Effects of Nitrogen Dioxide on Airway Inflammatory Responses in Allergic Asthmatic Subjects", submitted by the University of California, San Francisco, for a total amount not to exceed \$248,127.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein, and as described in Attachment A, in an amount not to exceed \$248,127.

I hereby certify that the above is a true and correct copy of Resolution 01-21, as adopted by the Air Resources Board.

Marie Kavan, Clerk of the Board

ATTACHMENT A

“Effects of Nitrogen Dioxide on Airway Inflammatory Responses in Allergic Asthmatic Subjects”

Background

Epidemiological data suggest that people with asthma may be more sensitive to NO₂ exposure than non-asthmatics. Animal toxicological data provide evidence that NO₂ exposure can affect immune function, including enhancement of allergic inflammatory responses in the lungs, including those involved in allergic asthma. Controlled human exposure studies have clearly confirmed that NO₂ exposure can enhance both the early and late bronchoconstrictor responses to inhaled antigen in allergic asthmatic subjects, but no data on airway inflammatory responses of asthmatic subjects to NO₂ exposure have been reported to date.

Objective

The proposal will address two questions. 1) Does NO₂ exposure enhance the specific airway inflammatory responses of asthmatic subjects during late-phase reactions to inhaled allergen, and 2) do asthmatic subjects have significant non-specific airway inflammation following exposure to a concentration of NO₂ not reported to cause airway inflammation in normal subjects.

Methods

The investigators will expose mild asthmatics to filtered air or controlled concentrations of NO₂. The study will also evaluate airways inflammatory responses to allergen exposure. Airway inflammation will be assessed by analysis of cellular and biochemical indicators of inflammation in induced sputum samples.

Expected Results

The results of the study will help to determine: (1) whether asthmatics develop airways inflammation with exposure to an environmentally relevant concentration of NO₂, and (2) whether NO₂ enhances inflammatory responses to allergens in asthmatics.

Significance to the Board

The California Ambient Air Quality Standard for NO₂ is 0.25 parts per million for one hour, although this standard has not been reviewed since 1992. Recently, under the requirements of The Children’s Environmental Health Protection Act (SB 25, 1999), all of the California ambient air quality standards were evaluated with the purpose of prioritizing them for full review. The prioritization process placed NO₂ third for review because of recent epidemiological research suggesting greater effects of NO₂ on asthmatics than on other sub-groups of the population, and studies suggesting an interaction between NO₂ and allergens.

This proposal directly addresses the issues that caused NO₂ to be prioritized third for review. The study will provide important experimental data that is not currently

available. Successful completion of this project will provide the Board with new information that is highly relevant to the upcoming NO₂ standard review.

Contractor: University of California, San Francisco, Lung Biology Center

Contract Period: 24 months

Principal Investigator: Colin Solomon, Ph.D.

Contract Amount: \$248,127

Cofunding: None

Basis for Indirect Cost Rate: The State and UC System have agreed to a ten percent indirect cost rate.

Past Experience with this Principal Investigator: Dr. Colin Solomon has conducted previous satisfactory work for the ARB.

Prior Research Division Funding to the University of California, San Francisco:

Year	2000	1999	1998
Funding	\$0	\$ 409,937	\$0

BUDGET SUMMARY

University of California, San Francisco

“Effects of Nitrogen Dioxide on Airway Inflammatory Responses
in Allergic Asthmatic Subjects”

DIRECT COSTS AND BENEFITS

1.	Labor and Employee Fringe Benefits	\$ 123,041
2.	Subcontractors	\$ 50,000
3.	Equipment	\$ 0
4.	Travel and Subsistence	\$ 4,060
5.	Electronic Data Processing	\$ 0
6.	Reproduction/Publication	\$ 209
7.	Mail and Phone	\$ 400
8.	Supplies	\$ 32,074 ⁽¹⁾
9.	Analyses	\$ 0
10.	Miscellaneous	<u>\$ 20,331</u>

Total Direct Costs \$230,115

INDIRECT COSTS

1.	Overhead	\$180,114
2.	General and Administrative Expenses	\$ 0
3.	Other Indirect Costs	\$ 0
4.	Fee or Profit	<u>\$ 0</u>

Total Indirect Costs \$18,012

TOTAL PROJECT COSTS

\$248,127

(notes)

- ⁽¹⁾ Lab Supplies including NO₂ gas, NO₂ analyzer standards, sputum induction, allergen challenge, gene expression assays, glass and plastic ware and assay kits.