**PROJECT SUMMARY** (See instructions):

Elderly individuals appear to be at the greatest risk from negative health ramifications as a result of reduced air quality due to their enhanced susceptibility because of normal and pathological aging and related processes. The deleterious effects of air pollution on cardiovascular and pulmonary health in the elderly have been well established, with inflammatory markers being associated with cardiac pathogenesis due to air pollution. The negative effects of air pollution on cognition, however, have been minimally examined. Limited research has observed cognitive declines in children and older adults due to elevated particulate matter, but most of these studies have been conducted abroad and in areas of chronic air pollution. As such, little is known about the acute and periodic impact of pollution on cognition. Wintertime temperature inversions in the Salt Lake Valley during December and January provide ‘optimal’ conditions for the acute accumulation of pollution, as cooler winter air is trapped on the valley floor. Nineteen days in the winter of 2013-2014 were categorized as unhealthy for older adults and other sensitive groups, suggesting that older Utahns are at risk of experiencing negative cognitive and inflammatory effects as a result. In this proposal, 45 older non-demented participants will receive 3 cognitive and biochemical assessments over a 4 week period during the months of December and January. Air quality measurements will be monitored on a daily basis through the State of Utah’s Division of Air Quality website for levels of Particulate Matter 2.5 (PM2.5) in µg/m3. Cognition is expected to decline in response to acute PM2.5 exposure (Specific Aim #1), and proinflammatory cytokines (C-reactive protein, interleukin-1) and neuroprotective factors (brain-derived neurotrophic factor) are expected to vary in association with acute PM2.5 exposure (Specific Aim #2), with the biomarker changes expected to mediate the relationship between pollution levels and working memory. If successful, these results will have a direct impact for the community, as it will provide preliminary information about the impact of acute poor air quality on cognition for Utah’s elderly, and will help guide regulators and policy makers in the state regarding future air quality decisions.

**RELEVANCE** (See instructions):

Evaluating cognition as a result of acute particulate matter exposure during Utah’s winter temperature inversions has the potential to shed light on the pollution-related health risks unique to Utah elderly, including understanding the underlying biochemical pathways associated with such risks and examining detailed dose-relationships between poor air quality days and reduced cognition/inflammation.

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**PROJECT/PERFORMANCE SITE(S)** (if additional space is needed, use Project/Performance Site Format Page)

**Project/Performance Site Primary Location**

Organizational Name: University of Utah  
DUNS: 009095365  
Street 1: 650 Komas Drive, 106A  
City: Salt Lake City  
Province: USA  
Zip/Postal Code: 84108  
County: Salt Lake  
State: UT

**Project/Performance Site Congressional Districts:**

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**Additional Project/Performance Site Location**

Organizational Name:  
DUNS:  
Street 1:  
Street 2:  
City:  
Province:  
County:  
State:  
Country:  
Zip/Postal Code:  
Project/Performance Site Congressional Districts: