

# World Trade Center

## WTC Health Program Study Descriptions

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**Centers for Disease Control  
and Prevention**  
National Institute for Occupational  
Safety and Health





## Appendix 1, Section 2

### WTC Health Program Research Portfolio Study Descriptions

# WTC Health Program Research Portfolio Study Descriptions

## WTC Research Contracts Awarded in FY 2011

### Trajectories of Psychological Risk and Resilience in World Trade Center Responders

**Contract Number:** 200-2011-41919

**Institutions:** Icahn School of Medicine at Mount Sinai School of Medicine and the Yale School of Medicine

**Principal Investigators:** Adriana Feder, MD, Robert Pietrzak, PhD, Steven Southwick, MD

**Phone Number:** (212) 659-9145

**Email:** [adriana.feder@mssm.edu](mailto:adriana.feder@mssm.edu)

**Project Duration:** 3 years (Project Completed)

**Description:** The objectives of this study are to (1) characterize longitudinal trajectories of WTC-related PTSD and depressive symptoms in WTC responders; (2) examine specific risk and protective determinants of these trajectories; and (3) identify personal and psychosocial factors associated with resilience and recovery trajectories, with the ultimate goal of maximizing preparedness

and improving mental health outcomes in disaster responders. The study shall make use of the unique dataset collected prospectively at the WTC Health Program, beginning in 2002, to study longitudinal trajectories of WTC-related PTSD and depressive symptoms in 10,800 cohort members who completed three monitoring visits at the WTC Health Program, each approximately two years apart.

### Cohort Studies of Incident Cancers in the FDNY WTC Responder Population

**Contract Number:** 200-2011-39489

**Institution:** Fire Department of New York

**Principal Investigator:** David Prezant, MD

**Phone Number:** (718) 999-2696

**Email:** [prezand@fdny.nyc.gov](mailto:prezand@fdny.nyc.gov)

**Project Duration:** 3 years (Project Completed)

**Description:** The main objective of this three-year research project is to analyze the cohorts of FDNY firefighters and EMS workers, both WTC-exposed and non-WTC exposed in order to compare cancer incidence by WTC-exposure status during the early post-9/11 years. To achieve this objective, we intend to conduct longitudinal surveillance of cancer diagnoses in WTC-exposed and non-WTC-exposed individuals through 2008 and later, as data become available.

### **Pulmonary Function Abnormalities, Diastolic Dysfunction and World Trade Center Exposure: Implications for Diagnosis and Treatment**

**Contract Number:** 200-2011-39405

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Maryann McLaughlin, MD, MPH

**Phone Number:** (866) 537-7107

**Email:** [cynara.maceda@mssm.edu](mailto:cynara.maceda@mssm.edu)

**Project Duration:** 3 years (Project Completed)

**Description:** The present proposal seeks to determine the significance of the long-term effect of particulate matter (PM) on pulmonary and cardiovascular risk, and to fully evaluate the relationship between PM exposure, pulmonary function, and cardiovascular health. We will evaluate the clinical and pathophysiologic outcomes of exposure including pulmonary function abnormalities, obstructive sleep apnea, imaging abnormalities, and risk factors for cardiopulmonary disease. This study will provide critical information regarding risk of exposure to PM, risk factors for disease and potential for improvements in diagnosis and treatment.

### **Burden of Mental-Physical Comorbidity in World Trade Center Responders**

**Contract Number:** 200-2011-39410

**Institution:** State University of New York at Stony Brook

**Principal Investigator:** Evelyn Bromet, PhD

**Phone Number:** (631) 632-8853

**Email:** [evelyn.bromet@stonybrook.edu](mailto:evelyn.bromet@stonybrook.edu)

**Project Duration:** 3 years (Project Completed)

**Description:** The study objective is to test mechanisms thought to be responsible for the comorbidity between psychiatric and medical sequelae of WTC exposures. We propose to study responders participating in the WTC Health Program. Of the entire cohort, approximately 16,000 completed the first two monitoring visits, about two years apart. In addition to routine questionnaires completed by responders at their monitoring visits, we conduct standard interviews designed to diagnose WTC-related PTSD. The longitudinal data will allow us to evaluate potential mechanisms underlying the links between mental and physical disorders.

### **Enhanced Smoking Cessation for WTC Responders**

**Contract Number:** 200-2011-42057

**Institution:** State University of New York at Stony Brook

**Principal Investigator:** Evelyn Bromet, PhD

**Phone Number:** (631) 632-8853

**Email:** [evelyn.bromet@stonybrook.edu](mailto:evelyn.bromet@stonybrook.edu)

**Project Duration:** 3 years (Project Completed)

**Description:** The objective of this study is to adapt and test an enhanced smoking cessation treatment for WTC responders burdened with PTSD symptoms. We will recruit 100 smokers who have significant PTSD symptoms from the population monitored at the Long Island site of the WTC Health Program and other responders in the New York metropolitan area with PTSD symptoms. We will over-sample patients with lower respiratory illness to ensure that at least two-thirds have these symptoms. Participants are randomly assigned

to either: (1) standard smoking cessation or (2) enhanced smoking cessation that addresses PTSD and other anxiety symptoms. Nicotine replacement therapy is administered to both groups.

### **Evaluation of Distal Airway Injury Following Exposure to World Trade Center Dust**

**Contract Number:** 200-2011-39413

**Institution:** New York University School of Medicine

**Principal Investigator:** Kenneth Berger, MD

**Phone Number:** (212) 263-6407, (212) 562-3752

**Email:** [kenneth.berger@nyumc.org](mailto:kenneth.berger@nyumc.org)

**Project Duration:** 3 years (Project Completed)

**Description:** The goal of the present proposal is to enhance characterization of WTC-related lung disease using lung function measurements that can detect lung injury in addition to abnormalities identified in standard spirometry. The proposed studies are based on the concept that spirometry may identify airway injury as a reduction in lung volume or air flow; however, spirometry can often be normal even in symptomatic patients, particularly when injury is located in the distal airways.

### **Cancer among WTC Responders: Enhanced Surveillance, Exposure Assessment, and Cancer-Specific Risks**

**Contract Number:** 200-2011-41815

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Paolo Boffetta, MD

**Phone Number:** (212) 659-1474

**Email:** [paolo.boffetta@mssm.edu](mailto:paolo.boffetta@mssm.edu)

**Project Duration:** 3 years (Project Completed)

**Description:** The overarching objective of the project is to define whether WTC responders included in the WTC Health Program experienced an increased risk of cancer, and whether or not such increase can be associated with WTC-related exposures. The specific aims of the project are to: 1) identify and confirm all cases of cancer occurring among WTC responders included in WTC Health Program, using multiple sources of information and developing algorithms for confirmation of cancer diagnosis; 2) develop and apply an exposure assessment procedure to estimate ERIs for selected known and suspected carcinogens for all WTC Health Program responders, and to conduct a systematic analysis of exposure-cancer associations, based on ERIs; and 3) conduct in-depth analyses of exposure-cancer associations.

### **Cardiovascular Health Impact and Prediction of Incident (Primary and Subsequent) Cardiovascular Events**

**Contract Number:** 200-2011-41826

**Institution:** Center for the Biology of Natural Systems (CBNS) CUNY-Queens College

**Principal Investigator:** Alfredo Morabia, MD

**Phone Number:** (718) 670-4182

**Email:** [alfredo.morabia@qc.cuny.edu](mailto:alfredo.morabia@qc.cuny.edu)

**Project Duration:** 3 years (Project Completed)

**Description:** This cohort study will assess the conventional CVD determinants, 9/11-related dust exposure, and PTSD, of

6,503 participants (of the Mt. Sinai and Northwell Health WTC Health Program) recruited between January 2012, and June 2013. We will follow the cohort for incident CVD during the subsequent two years, 2013 and 2014. Cardiovascular risk has been obtained from questionnaires and clinical exams. The on-going follow-up will track all incident events over two years by direct contact with the participants. Validation of events will be performed by obtaining hospital discharge and outpatient medical records, patient electronic databases (SPARCS), and death certificates. In addition to its direct relevance for the health surveillance of WTC workers, this project will accrue new knowledge on the long-term effects of a major environmental disaster on the cardiovascular health of rescue, recovery, and clean-up workers.

## WTC Research Cooperative Agreements Awarded in FY 2012

### Bronchial Reactivity and the Course of Lung Function

**Project Number:** U01 OH010411-01

**Institution:** Albert Einstein College of Medicine

**Principal Investigator:** Thomas Aldrich, MD

**Phone Number:** (718) 999-0734 (office)

**Email:** [Rachel.Zeig-Owens@fdny.nyc.gov](mailto:Rachel.Zeig-Owens@fdny.nyc.gov)

**Project Duration:** 2 years (Project Completed)

**Description:** Persistent obstructive airways disease (an asthma-like condition) is common among WTC exposed firefighters, though rare in this population before September 11, 2001. In about 30%, there is accompanying bronchial hyperreactivity (easily triggered airway narrowing). This study will re-examine a large number of firefighters who had bronchial reactivity soon after 9/11 to determine whether those with bronchial hyperreactivity at onset have persistent hyperactivity more than ten years later, whether they have accelerated lung function decline, and whether those treated with anti-asthma medications were more likely to show resolution of bronchial hyperactivity and/or show less rapid decline in lung function.

### For How Long is WTC Exposure Associated with Incident Airway Obstruction

**Project Number:** U01 OH010412-01

**Institution:** Albert Einstein College of Medicine

**Principal Investigator:** Charles Hall, PhD

**Phone Number:** (917) 803-5470

**Email:** [charles.hall@einstein.yu.edu](mailto:charles.hall@einstein.yu.edu)

**Project Duration:** 2 years (Project Completed)

**Description:** The study uses innovative statistical methods (parametric survival models with change points) to study the incidence of new onset OAD diagnoses and symptoms over the first ten years following WTC exposure, with the goal of determining the length of time that exposure response gradients are observed among exposed FDNY firefighters. This study will allow estimation of the length of time that a relatively short-term, high intensity exposure may be associated with incident respiratory illness.

### **Pulmonary Diseases in WTC Workers: Symptoms, Function, and Chest CT Correlates**

**Project Number:** U01 OH010401-01

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Rafael E. de la Hoz, MD

**Phone Number:** (212) 241-8871

**Email:** [Lilliam.Medina@mssm.edu](mailto:Lilliam.Medina@mssm.edu)

**Project Duration:** 4 years (Project Completed)

**Description:** The overall goal of this study is to identify the early manifestations of lung disease among the WTC workers and volunteers, as well as investigate their risk factors. The study team will perform standardized and computer-assisted readings of all chest CT scans received by WTC workers and volunteers at the Mount Sinai Medical Center since January 2003; assess the findings in a systematic way; evaluate the correlation of findings with clinical, functional, and exposure indicators; and develop a protocol for continued radiological surveillance of this cohort.

### **Biomarkers of Psychological Risk and Resilience in World Trade Center Responders**

**Project Number:** U01 OH010407-01

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigators:** Adriana Feder, MD; Robert Pietrzak, PhD; Steven Southwick, MD

**Phone Number:** (212) 659-9145

**Email:** [adriana.feder@mssm.edu](mailto:adriana.feder@mssm.edu)

**Project Duration:** 4 years (Project Completed)

**Description:** This study will employ a multi-level approach to study clinical, psychosocial, neuroendocrine, genotypic, gene-environment interaction, and molecular factors associated with PTSD risk and resilience in a sample of 500 WTC responders. The study will provide important information about the risk and resilience factors for PTSD in disaster responders and make possible the development of improved preventive and treatment interventions for this disorder in disaster responders and trauma-exposed individuals in general.

### **Prognosis and Determinants of Asthma Morbidity in WTC Rescue and Recovery Workers**

**Project Number:** U01 OH010405-01

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Juan Wisnivesky, MD, DrPH

**Phone Number:** (212) 824-7567

**Email:** [juan.wisnivesky@mssm.edu](mailto:juan.wisnivesky@mssm.edu)

**Project Duration:** 4 years (Project Completed)

**Description:** Asthma is a common illness among WTC workers (nine-year cumulative incidence is about 28%) and is responsible for a high rate of morbidity and diminished quality of life in this population. However, there is limited data regarding the natural history or factors that contribute to asthma morbidity among WTC workers. The objective of this study is to examine the natural history, self-management, and impact of physical and mental health comorbidities on asthma morbidity among WTC rescue and recovery workers.

### The Impact of 9/11 on Youth: Mental Health, Substance Use & Other Risk Behaviors

**Project Number:** U01 OH010414-01

**Institution:** New York State Psychiatric Institute at Columbia University

**Principal Investigator:** Christina W. Hoven, DrPH, MPH

**Phone Number:** (646) 774-5800

**Email:** [ch42@columbia.edu](mailto:ch42@columbia.edu)

**Project Duration:** 4 years (Project Completed)

**Description:** Worldwide Public Health concern about disaster and its long-term consequences on mental health remains an important but inadequately addressed issue. This study examines the mental health, substance use and other risky behaviors, among children directly exposed to the 9/11 attack—current ages 12-24. The study is designed to obtain an in depth assessment of these adolescents' and emerging adults' current level of need, with the intention of facilitating treatment, diagnosis and intervention, as well as to inform public policy.

### Service Need and Use Among Youth Exposed to the WTC Attack

**Project Number:** U01 OH010413-01

**Institution:** New York State Psychiatric Institute at Columbia University

**Principal Investigator:** Christina W. Hoven, DrPH, MPH

**Phone Number:** (646) 774-5800

**Email:** [ch42@columbia.edu](mailto:ch42@columbia.edu)

**Project Duration:** 2 years (Project Completed)

**Description:** This study will examine patterns

of mental health service utilization, barriers to mental health treatment services, and the factors associated with such use by youth who were exposed to the WTC attack. The study findings will provide guidance to the improvement of mental health intervention for these youth and will help in preparedness efforts for future terrorist attacks.

### Health and Socioeconomic Sequelae of the WTC Disaster Among Responders

**Project Number:** U01 OH010399-01

**Institution:** Northwell Health

**Principal Investigator:** Hyun Kim, ScD

**Phone Number:** (516) 465-2517

**Email:** [hkim8@nshs.edu](mailto:hkim8@nshs.edu)

**Project Duration:** 2 years (Project Completed)

**Description:** This study will comprehensively describe the overall physical, mental, and socioeconomic impact of the WTC disaster on responders, as well as identify the linkage between socioeconomic sequelae and health among WTC responders. Results from this study have the potential to make a significant public health impact through the identification of new diseases and high-risk groups within the WTC cohort, and aid future development of new guidelines for the implementation of an occupational health surveillance system for disasters, which is essential for disaster preparedness

### Epigenetic Linkage between PTSD and Respiratory Disease in WTC Responders

**Project Number:** U01 OH010416-01

**Institution:** State University of New York at Stony Brook

**Principal Investigator:** Benjamin Luft, MD

**Phone Number:** (631) 855-1200

**Email:** [benjamin.luft@stonybrookmedicine.edu](mailto:benjamin.luft@stonybrookmedicine.edu)

**Project Duration:** 2 years (Project Completed)

**Description:** WTC disaster responders exhibit persistent symptoms of PTSD and respiratory illness linked to the severity of their exposures. One-quarter of responders affected by these conditions suffer from both, resulting in increased disability and utilization of medical services. This study will examine the potential mechanisms underlying PTSD/respiratory co-morbidity that may facilitate the development of more effective, theory-driven interventions for these difficult to treat patients.

### **Obstructive Sleep Apnea in WTC Responders; Role of Nasal Pathology**

**Project Number:** U01 OH010415-01

**Institution:** Robert Wood Johnson Medical School at Rutgers University and NYU School of Medicine

**Principal Investigator:** Jag Sunderram, MD; Indu Ayappa, PhD

**Phone Number:** (732) 235-7038

**Email:** [sunderja@rwjms.rutgers.edu](mailto:sunderja@rwjms.rutgers.edu)

**Project Duration:** 4 years (Project Completed)

**Description:** Obstructive sleep apnea (OSA) is a highly prevalent disorder with significant morbidity and impact on quality of life that can be improved by treatment with CPAP. This study will examine the role of nasal pathology in WTC responders in the development of OSA and its impact on their ability to use CPAP. The present study contributes to understanding the relationship of nasal

/upper airway mechanisms to the development of sleep apnea in this population and explores the possibility of improving comfort and adherence to CPAP treatment by modifying how CPAP is delivered.

### **Extension of the World Trade Center Health Registry**

**Project Number:** U50-OH009739

**Institution:** New York City Department of Health and Mental Hygiene

**Principal Investigator:** Mark Farfel, ScD

**Phone Number:** (646) 632-6649

**Email:** [mfarfel@health.nyc.gov](mailto:mfarfel@health.nyc.gov)

**Project Duration:** 4 years (Project Completed)

**Description:** During the funding period, Registry staff will conduct priority epidemiological analyses using data from the Wave 1 (2003-04), Wave 2 (2006-08), and Wave 3 (2011-12) surveys, including analyses to assess risk factors for the development or persistence of serious respiratory and mental health conditions over time. A Wave 4 survey will be conducted using multiple survey modes to ascertain the health status and 9/11-related healthcare needs of the cohort 13-14 years after 9/11. The Registry will also extend the assessment of cancer and mortality incidence through 10 years post-9/11, investigate potential emerging health conditions through public health surveillance and follow-up studies (including collaborations with the WTC Health Program and other external researchers), and continue outreach to encourage enrollees to access monitoring and treatment through the WTC Health Program.

## WTC Research Cooperative Agreements Awarded in FY 2013

### Post-9/11 Incidence of Systemic Autoimmune Diseases in the FDNY Cohort

**Project Number:** U01 OH010513

**Institution:** Albert Einstein College of  
Medicine

**Principal Investigator:** Mayris Webber,  
DrPH

**Phone Number:** (718) 999-2665

**Email:** [webberm@fdny.nyc.gov](mailto:webberm@fdny.nyc.gov)

**Project Duration:** 2 years (Project Completed)

**Description:** The overall goal of this two-year study is to calculate in 21,786 WTC-exposed and unexposed firefighters and emergency medical service workers and to estimate the association between intense WTC exposure and SAID. If results suggest that SAID are increased in relation to WTC exposure, FDNY and other centers of excellence could then incorporate active case finding into routine monitoring visits, facilitating early detection and treatment, which has been shown to reduce end-organ damage and improve quality of life.

### Trace Elements in Autopsy Tissue from World Trade Center Decedents

**Project Number:** U01 OH010395-01A1

**Institution:** New York University School of  
Medicine

**Principal Investigator:** Michael Marmor,  
PhD

**Phone Number:** (212) 263-6667

**Email:** [michael.marmor@nyumc.org](mailto:michael.marmor@nyumc.org)

**Project Duration:** 2 years (Project Completed)

**Description:** This study will determine if WTC-related trace elements can be identified in tissues of individuals at their times of death in 2007–2012. If signature trace elements can be identified, this project will lay the foundation for future development of biomarkers indicative of cumulative exposure to WTC contaminants among living individuals. Biomarkers reflective of WTC exposures would be of value to research on the health effects of WTC exposures among first responders, residents and workers, including members of the WTC Health Program. They would also be helpful for the investigation and attribution of diseases among WTC-exposed individuals and may aid in the treatment of WTC-associated diseases.

### Early Identification of World Trade Center Conditions in Adolescents

**Project Number:** U01 OH010394-01A1

**Institution:** New York University School of  
Medicine

**Principal Investigator:** Leonardo  
Trasande, MD, MPP

**Phone Number:** (646) 501-2520

**Email:** [leonardo.trasande@nyumc.org](mailto:leonardo.trasande@nyumc.org)

**Project Duration:** 3 years (Project Completed)

**Description:** This study builds on preliminary studies in self-selected populations to identify opportunities for early identification of WTC-related health consequences in adolescents. If adverse health consequences are identified, proactive cardiometabolic and pulmonary screening of exposed children may be indicated, with targeted interventions intended to prevent development of chronic obstructive pulmonary disease,

and adverse cardiometabolic outcomes in adulthood.

### Uncontrolled Lower Respiratory Symptoms in the WTC Survivor Program

**Project Number:** U01 OH010404-01A1

**Institution:** New York University School of Medicine

**Principal Investigator:** Joan Reibman, MD

**Phone Number:** (212) 263-6479

**Email:** [joan.reibman@nyumc.org](mailto:joan.reibman@nyumc.org)

**Project Duration:** 3 years (Project Completed)

**Description:** Many “survivors” (community members) in the WTC clinical treatment program have persistent LRS, despite treatment. This study will test the hypothesis that patients with uncontrolled LRS have (despite aggressive medical therapy) increased rates of abnormal airway physiology, airway inflammation and co-morbid conditions when compared to those with controlled symptoms. Identifying these mechanisms for uncontrolled LRS is imperative to guide therapy with the important potential to reduce secondary adverse health outcomes.

### Prostate Cancer Risk and Outcome in WTC Respondents

**Project Number:** U01 OH010396-01A1

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Emanuela Taioli, MD, PhD

**Phone Number:** (516) 465-3093

**Email:** [emanuela.taioli@mssm.edu](mailto:emanuela.taioli@mssm.edu)

**Project Duration:** 2 years (Project Completed)

**Description:** This study represents the first in-depth analysis of prostate cancer among WTC rescue and recovery workers. The study results will have practical implications on the surveillance and clinical management of prostate cancer, which is the most common cancer among male WTC Health Program members. The study will generate novel data on biomarkers of prostate cancer aggressiveness that could be used to make decisions on clinical treatment.

### Mind-Body Treatment for WTC Responders with Comorbid PTSD and Respiratory Illness

**Project Number:** U01 OH010524

**Institution:** State University of New York at Stony Brook

**Principal Investigator:** Adam Gonzalez, PhD

**Phone Number:** (631) 855-1233

**Email:** [adam.gonzalez@stonybrook.edu](mailto:adam.gonzalez@stonybrook.edu)

**Project Duration:** 3 years (Project Completed)

**Description:** Comorbid PTSD and respiratory illness continue to burden WTC responders over a decade post disaster, despite pharmaceutical and psychotherapeutic treatment efforts. Mind-body treatments have demonstrated promise for reducing both PTSD and respiratory symptoms, and potential biological markers underlying these conditions; however no RCT has evaluated this treatment approach among patients with comorbid PTSD and respiratory illness. This study will be the first RCT to evaluate a novel mind-body treatment among WTC responders with these comorbidities and could have important implications for health care costs, quality of life and functioning, morbidity and possibly mortality.

## WTC Research Cooperative Agreements Awarded in FY 2014

### Post-9/11 Cancer Incidence in FDNY Firefighters

**Project Number:** U01 OH010728

**Institution:** Albert Einstein College of Medicine

**Principal Investigator:** Mayris Webber, DrPH

**Phone Number:** (718) 999-2665

**Email:** [webberm@fdny.nyc.gov](mailto:webberm@fdny.nyc.gov)

**Project Duration:** 2 years (Project Completed)

**Description:** Modest elevations in cancer rates post-exposure to the WTC site have been reported in all three cohorts of rescue/recovery workers. The overarching goal of this proposal is to improve understanding of the association between WTC exposure and cancer risk. We will: 1) Compare cancer rates in WTC-exposed NYC firefighters to rates in non-WTC-exposed firefighters; 2) develop a new exposure measure based on work records and model cancer incidence rates as a function of both time of first arrival at the WTC site and the new duration measure; and, 3) estimate the future cancer burden of WTC-exposed firefighters.

### Biorepository of Cancer Tissue Samples from WTC Responders

**Project Number:** U01 OH010512-01A1

**Institution:** Feinstein Institute for Medical Research

**Principal Investigator:** Emanuela Taioli, MD, PhD

**Phone Number:** (516) 465-3093

**Email:** [etaioli@nshs.edu](mailto:etaioli@nshs.edu)

**Project Duration:** 2 years (Project Completed)

**Description:** The current project aims to establish a biorepository of cancer tissue samples from WTC responders. This biorepository will consolidate tissue samples from all those in the WTC cohort that consent to participate. These samples will be stored in a centralized location, de-identified, and cataloged. This will allow for future research into WTC-specific mechanisms involved in cancer development, and will result in improved treatment options for WTC responders. Procedures will be implemented to review and grant/deny requests for use of samples in biomedical research based on a rigorous review.

### Deciphering Biological Linkages between PTSD and Respiratory Disease in WTC Responders

**Project Number:** U01OH010718-01

**Institution:** State University of New York at Stony Brook

**Principal Investigator:** Benjamin Luft, MD

**Phone Number:** (631) 855-1200

**Email:** [benjamin.luft@stonybrookmedicine.edu](mailto:benjamin.luft@stonybrookmedicine.edu)

**Project Duration:** 2 years (Project Completed)

**Description:** The September 11, 2001, terrorist attack on the WTC was an extraordinary environmental disaster resulting in an unprecedented combination of physical and emotional trauma. As many as 60% of responders will experience clinically significant symptoms, most prominently PTSD and LRS. Our group found that PTSD is not only associated with LRS but may contribute to

the development of these symptoms as well as diminish their response to treatment. We have performed epigenetic studies and are beginning to untangle the genes responsible for this association. The proposed study will extend these findings to identify the precise cell where these pathogenic relationships are occurring. Ultimately, this knowledge will lead to the development of better diagnostics and more specific treatment for this disease process.

### **The Daily Burden of PTSD and Respiratory Problems in World Trade Center Responders**

**Project Number:** U01 OH010712-01

**Institution:** State University of New York at Stony Brook

**Principal Investigator:** Roman Kotov, PhD

**Phone Number:** (631) 632-7763

**Email:** [Roman.Kotov@stonybrook.edu](mailto:Roman.Kotov@stonybrook.edu)

**Project Duration:** 2 years (Project Completed)

**Description:** Comorbid PTSD and LRS are among the most common and persistent health burdens faced by WTC responders following the attacks on 9/11. For the first time, the proposed study will use ecological momentary assessment approach to survey WTC responders in real time about the prevalence, burden and the sequence of PTSD and LRS, and to test biological processes involved.

### **Evolution of Risk Factors for Sinusitis in WTC Exposed Firefighters**

**Project Number:** U01 OH010726-01

**Institution:** New York University School of Medicine

**Principal Investigator:** Michael Weiden, MD

**Phone Number:** (212) 263-6479

**Email:** [michael.weiden@nyumc.org](mailto:michael.weiden@nyumc.org)

**Project Duration:** 2 years (Project Completed)

**Description:** Early neutrophil concentrations in blood drawn within 6 months of exposure were a risk factor for progressive sinusitis. Despite treatment, those affected continue to experience morbidity and reduced quality of life, while screening continues to identify new cases. Development of models, using an inexpensive, biomarker (complete blood count or CBC) that predicts disease severity and progression may enable earlier and more aggressive interventions to improve the health of WTC-exposed subjects. This may improve the quality of life of those with high risk of proceeding to sinus surgery. This may also avoid radiation exposure to those at low risk.

### **For How Long is the WTC Exposure Associated with Chronic Rhinosinusitis**

**Project Number:** U01 OH010711-01

**Institution:** Albert Einstein College of Medicine

**Principal Investigator:** Charles B. Hall, PhD

**Phone Number:** (917) 803-5470

**Email:** [charles.hall@einstein.yu.edu](mailto:charles.hall@einstein.yu.edu)

**Project Duration:** 2 years

**Description:** This study will use innovative statistical methods to examine the temporal patterns in the association between the effects of rescue/recovery work at the WTC by FDNY firefighters on the incidence of physician-diagnosed CRS and

on self-reported persistent rhinosinusitis symptoms. Specifically, we will use parametric survival models with change points to determine whether the exposure-response relationship persists for years after exposure or becomes attenuated after some time.

### **Mental Health Impact and Service Use among Asian Survivors and Rescuers Exposed to the WTC Attack**

**Project Number:** U01 OH010516-01A1

**Institution:** Fordham University

**Principal Investigator:** Winnie Kung, PhD

**Phone Number:** (347) 239-1717 **Email:** [kung@fordham.edu](mailto:kung@fordham.edu)

**Project Duration:** 2 years

**Description:** This study attempts to assess the short-, medium-, and long-term mental health impact of the WTC attack on Asian Americans. The course of the psychological distress and its related risk factors will be explored, and the pattern is compared to that of whites. It also examines Asians' mental health service use patterns and the facilitating factors and barriers to help seeking. It has important policy implications in improving treatment access to this sizable but understudied subgroup affected by the attack, which has a history of being the lowest mental health service users compared to other races.

### **Assessing the Impacts of Epidemiologic Biases in WTC Health Studies**

**Project Number:** U01 OH010730-01

**Institution:** Feinstein Institute for Medical Research

**Principal Investigator:** Hyun Kim, ScD

**Phone Number:** (516) 465-2517

**Email:** [kimx4804@umn.edu](mailto:kimx4804@umn.edu)

**Project Duration:** 2 years

**Description:** The main goal of the proposed study is to assess the impacts of epidemiologic biases in WTC health studies by identifying the presence of bias and then by quantifying and adjusting for the bias effects. The successful completion of the proposed bias analysis will assist other researchers to draw plausible inference of WTC health effects and other future disaster studies by adjusting for bias.

### **WTC-Heart: A Cohort Study of Heart Diseases in World Trade Center Responders**

**Project Number:** U01 OH010722-01

**Institution:** Center for the Biology of Natural Systems (CBNS) CUNY-Queens College

**Principal Investigator:** Alfredo Morabia, MD

**Phone Number:** (718) 670-4182

**Email:** [alfredo.morabia@qc.cuny.edu](mailto:alfredo.morabia@qc.cuny.edu)

**Project Duration:** 2 years

**Description:** Several research studies indicate that people working or residing near Ground Zero in 2001-2002 are at increased risk of CVD. It is hypothesized that this increased risk is a result of exposure to the dust and gases liberated by the destruction of the twin towers and/ or the psychological stress of working in such a dramatic human and environmental disaster. WTC-Heart (n=6,481) is a rigorous cohort study comprised of responders and volunteers recruited at the WTC Health Program. WTC-Heart will provide unique evidence of observed

CVD risk and predicted CVD risk in WTC responders to guide the implementation of preventive interventions.

### **Renal and Cardiovascular Impairment in WTC Responders: Implications for Diagnosis and Treatment**

**Contract Number:** U01 OH010716-01

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Maryann McLaughlin, MD, MPH

**Phone Number:** 1 (866) 537-7107

**Email:** [cynara.maceda@mssm.edu](mailto:cynara.maceda@mssm.edu)

**Project Duration:** 2 years (Project Completed)

**Description:** Environmental toxins exert damaging health effects in workers. Volunteers of the WTC rescue and recovery effort following WTC attacks may be at increased risk for worsening health. The goal of this proposal is to quantify the risk of kidney damage among first responders to the WTC attack and determine its relationship to particulate matter exposure. We hypothesize that exposure to inhaled particulate matter causes systemic inflammation and endothelial dysfunction that result in chronic kidney and cardiovascular damage. Knowledge to be gained from this proposal can influence strategies to minimize the risk of chronic kidney and cardiovascular disease among first responders

### **WTC Research Cooperative Agreements Awarded in FY 2015**

#### **A Pilot Test of the Relaxation Response Resiliency Program (3RP) in Spanish**

#### **Speaking World Trade Center Disaster Survivors with PTSD**

**Project Number:** U01 OH0 10996-01

**Institution:** New York University School of Medicine

**Principal Investigator:** Lucia Ferri, PhD

**Phone Number:** (212) 562-1735

**Email:** [Lucia.Ferri@bellevue.nychhc.org](mailto:Lucia.Ferri@bellevue.nychhc.org)

**Project Duration:** 1 year (Project Completed)

**Description:** Individuals directly exposed to 9/11 WTC disaster, including community members who lived or worked in the area, continue to experience significant psychiatric and physical health symptoms. At the WTC EHC, at least one-third of patients serviced are Hispanic with Spanish as their primary language. Unfortunately, there are limited, empirically-supported treatment protocols that are translated and available in Spanish for this population. This study will adapt and translate the Relaxation Response Resiliency Program (3RP), a comprehensive mind-body treatment, for Spanish-speaking WTC survivors. We will evaluate whether the treatment is acceptable and feasible for this population.

#### **Childhood Exposures to Persistent Organic Pollutants in the World Trade Center Disaster and Cardiovascular Consequences**

**Project Number:** U01 OH010714-01A1

**Institution:** New York University School of Medicine

**Principal Investigator:** Leonardo Trasande, MD, MPP

**Phone Number:** (646) 501-2520

**Email:** [leonardo.trasande@nyumc.org](mailto:leonardo.trasande@nyumc.org)

**Project Duration:** 1 year (Project Completed)

**Description:** The study builds upon a NOSH-supported study of WTC-exposed adolescents to assess whether persistent organic pollutant exposures are potentially contributors to cardiometabolic conditions in adolescents. If these exposures are associated with cardiometabolic consequences and with reported exposure to the disaster, these findings will enhance understanding of WTC-associated conditions and guide proactive screening and management of future disasters.

### Clinical Characteristics and Outcomes of WTC-Associated Sarcoidosis

**Project Number:** U01 OH0 10993-01

**Institution:** Albert Einstein College of Medicine

**Principal Investigator:** Simon Spivack, MD, MPH/Thomas Aldrich, MD

**Phone Number:** (718) 678-1040 (office);

**Email:** [simon.spivack@einstein.yu.edu](mailto:simon.spivack@einstein.yu.edu)

**Project Duration:** 1 year (Project Completed)

**Description:** Sarcoidosis, an inflammatory disease of unknown cause that can affect almost any organ, has been noted in unexpectedly large numbers of WTC-exposed persons, including 76 FDNY firefighters. This project is a detailed re-examination of this group, to define their clinical patterns and genetic markers and compare them with those of previously reported non-WTC-exposed sarcoidosis patients. We will also assess genetic differences with similarly WTC-exposed firefighters who did not develop sarcoidosis. The results should help to determine the extent and severity of sarcoidosis triggered by a unique occupational exposure.

### Cognitive Function among World Trade Center Rescue and Recovery Workers—Direct Effect or Mediation through Comorbidities

**Project Number:** U01 OH0 10988-01

**Institution:** New York University School of Medicine

**Principal Investigator:** Cheryl Stein, MD

**Phone Number:** (646) 754-4886

**Email:** [cheryl.stein@nyumc.org](mailto:cheryl.stein@nyumc.org)

**Project Duration:** 1 year (Project Completed)

**Description:** The main goal of the study is to use existing, longitudinal data from the New York City Region Clinical Centers of Excellence to examine the association between WTC exposure and cognitive function among the nearly 25,000 rescue and recovery workers participating in the WTC Health Program. First we want to determine whether there is evidence of cognitive dysfunction among rescue and recovery workers. Then if there is evidence of cognitive dysfunction, we will try to tease apart whether the dysfunction is due to WTC exposure (e.g., dust, chemicals), WTC-related illness (e.g., CVD, depression), or both.

### Context and Ethnic Diversity: Children's Responses to 9/11

**Project Number:** U01 OH0 10721-01A1

**Institution:** New York State Psychiatric Institute at Columbia University

**Principal Investigator:** Christina W. Hoven, DrPH, MPH

**Phone Number:** (646) 774-5800

**Email:** [ch42@columbia.edu](mailto:ch42@columbia.edu)

**Project Duration:** 1 year (Project Completed)

**Description:** The Trauma, Context and Outcome (TCO) study will identify the role that race/ethnicity, interacting with family and neighborhood contextual factors, had on the mental health outcomes of youth exposed to 9/11 and will contribute to the NIOSH WTC Health Program. This study will clarify the role that children's context played in determining if they had a resilient, versus an adverse response to 9/11. This understanding is key to the development of improved and targeted prevention and treatment strategies, as well as public policies, for all children exposed to mass trauma, but especially minority populations.

### **Enhanced Assessment of WTC Exposure and Global DNA Methylation**

**Project Number:** U01 OH 010987-01

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Paolo Boffetta, MD

**Phone Number:** (212) 659-1474

**Email:** [paolo.boffetta@mssm.edu](mailto:paolo.boffetta@mssm.edu)

**Project Duration:** 1 year (Project Completed)

**Description:** The project aims at correlating a detailed assessment of exposure of WTC responders enrolled at program at Stony Brook with alterations the mechanism of regulation of DNA called methylation, which may be relevant to cancer risk. The project is expected to contribute to understanding of the possible role of DNA methylation as marker of exposure to carcinogenic exposure among WTC responders. If the results confirm a correlation between WTC exposures, assessed through a high-quality

methodology, and altered DNA methylation, they might lead to the development of strategies to identify WTC responders at increased risk of cancer and other chronic diseases.

### **Gene Expression Profiles as Markers of PTSD Risk and Resilience in WTC Responders**

**Project Number:** U01 OH010986-01

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Adriana Feder, MD

**Phone Number:** (212) 659-9145

**Email:** [adriana.feder@mssm.edu](mailto:adriana.feder@mssm.edu)

**Project Duration:** 1 year (project completed)

**Description:** PTSD arising in response to the WTC disaster is one of the most prevalent and persistent psychiatric disorders among workers involved in rescue, recovery, and clean-up efforts, even over a decade after 9/11. This study involves a comprehensive, multi-modal, and integrative assessment of biomarkers implicated in the pathophysiology of PTSD, including measuring differences in whole-blood gene expression and other blood biomarkers of key neurobiological systems, an approach critical to informing risk and resilience prediction algorithms for PTSD, and to develop novel psychopharmacologic approaches for the treatment of this disabling condition in disaster responders and other trauma survivors.

## WTC Research Cooperative Agreements Awarded in FY 2016

### Extension of the World Trade Center Health Registry (U50)

**Project Number:** U50 OH009739-08

**Institution:** New York City Department of Health and Mental Hygiene

**Principal Investigator:** Mark Farfel, ScD

**Phone Number:** (646) 632-6649

**Email:** [mfarfel@health.nyc.gov](mailto:mfarfel@health.nyc.gov)

**Project Duration:** 5 years

**Description:** The WTC Health Registry contributes to public health by identifying the longterm physical and mental health effects and health care needs of persons directly affected by the WTC disaster. The Registry follows a diverse cohort of over 71,000 persons who performed 9/11-related rescue/recovery work, or who lived, worked or attended school in lower Manhattan on September 11, 2001. The Registry shares its health findings and recommendations with enrollees, the public, health care providers, scientists, policy makers, and the WTC Health Program. The Registry also provides information about 9/11-related services and offers enrollee referrals to the WTC Health Program.

### Head and Neck Cancer in the World Trade Center Health Program Cohort; Elucidating Risk Factors to Reduce Incidence and Morbidity

**Project Number:** U01 OH011322-01

**Institution:** Rutgers, The State University of New Jersey

**Principal Investigator:** Judith Graber, PhD

**Phone Number:** (848) 445-0190

**Email:** [graber@ehsi.rutgers.edu](mailto:graber@ehsi.rutgers.edu)

**Project Duration:** 2 years

**Description:** The study will investigate whether exposure to pollution from the WTC 9/11 attacks is associated with increased risk of head and neck cancer among WTC responders and remediation workers. It will further explore whether that exposure adds to known causes of head and neck cancer including tobacco and alcohol. The findings from this study will help to build the evidence base for developing recommendations for modifying risk factors for these devastating cancers among WTC responders, including tobacco and alcohol use.

### Evolution of Risk Factors for Lung Function Decline in WTC Exposed Firefighters

**Project Number:** U01 OH011302-01

**Institution:** New York University School of Medicine

**Principal Investigator:** Michael Weiden, MD

**Phone Number:** (212) 263-6479

**Email:** [weidem01@nyumc.org](mailto:weidem01@nyumc.org)

**Project Duration:** 3 years

**Description:** The study will utilize recently obtained serum to test if biomarkers such as IgE are persistently associated with enhanced-FEV1-decline testing the hypothesis that Eos, PMN, IgE are risk factors for enhanced-FEV1 decline using serum collected from 10/2001-2/2002 and serum collected 2013-2015. This will allow for more intensive monitoring and early treatment to be directed toward high risk individuals; meanwhile, avoided devoting costly resources to intensive screening individuals at low risk for severe disease. This investigation could rationalize anti-IgE in patients with enhanced-FEV1-decline refractory to standard therapy even when there is no other evidence of atopy.

### **Maintenance and Extension of a Cohort of Career Firefighters as a Non-WTC Exposed Comparison for the FDNY Firefighter Cohort**

**Project Number:** U01 OH011309-01

**Institution:** Albert Einstein College of Medicine

**Principal Investigator:** Mayris Webber, DrPH

**Phone Number:** (718) 999-2665

**Email:** [MWebber@montefiore.org](mailto:MWebber@montefiore.org)

**Project Duration:** 5 years

**Description:** Most studies of WTC-exposed populations have reported the occurrence of various conditions thought to present more commonly as a consequence of exposure to the WTC disaster site. Because a non-WTC-exposed comparison group has not yet been identified, the most critical question remains unanswered: to what extent are apparent disease and symptom excesses associated with WTC exposure? This 5-year

project will address this question through the ongoing study inclusion of an established comparison cohort of non-NYC-based urban firefighters who were not exposed to the disaster site to estimate disease risk in WTC-exposed compared with risk in unexposed firefighters.

### **Small Airway Chronic Obstructive Disease Syndrome Following Exposure to WTC Dust**

**Project Number:** U01 OH011317-01

**Institution:** New York University School of Medicine

**Principal Investigator:** Kenneth Berger, MD

**Phone Number:** (212) 263-6407

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**Project Duration:** 3 years

**Description:** Many “survivors” in the WTC clinical program have a clinical syndrome characterized by chronic obstruction in small airways and persistence of LRS despite therapy. This study will test the hypothesis that persistent symptoms in WTC “survivors” are associated with abnormal small airways whose dysfunction is amplified during exercise and is associated with biologic evidence of inflammation and remodeling. The results from this study will have important treatment implications for our WTC population with potential applicability to larger populations with inhalational lung injury and/or airway diseases such as asthma and chronic obstructive pulmonary disease.

### World Trade Center Exposures, Neuropathic Symptoms and Nervous System Injury Symptoms, and Nervous System Injury

**Project Number:** U01 OH0 11305-01

**Institution:** New York University School of Medicine

**Principal Investigator:** Michael Marmor, PhD

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**Project Duration:** 2 years

**Description:** Many survivors and first responders have complained of neuropathic symptoms following exposure to the WTC attacks of September 11, 2001, or the subsequent clean-up activities. This study will investigate neuropathy among WTC survivors using interview data, neurologic examinations, skin biopsies to measure small fiber nerve densities, electromyograms and nerve conduction velocity studies. Findings of associations between WTC exposures and neuropathic symptoms would advance the field of toxic neuropathies and provide data that might affect the decision to include or exclude neuropathies in the list of WTC-Related Health Conditions covered in the WTC Health Program.

### RDoC Domains Underlying Emotional Health and Trajectories of Psychopathology in Families of WTC First Responders and Evacuees: A Genome-Wide GxE Study

**Project Number:** U01 OH011327-01

**Institution:** New York State Psychiatric Institute at Columbia University

**Principal Investigator:** Christine Hoven, DrPH

**Phone Number:** (646) 774-6068

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**Project Duration:** 5 years

**Description:** The Wave 3 WTC Family Study examines prospectively the consequences of parental 9/11 exposure to children and parents in a sample of first responders and WTC evacuees previously assessed in two waves of data collection, with non-exposed control families. The study examines the link between WTC exposure and a range of psychiatric disorders and explores the RDoC constructs of mental function and the gene-environment interactions that underlie them. The overall aim is to understand post-9/11 long-term psychiatric outcomes and emotional health through an examination of their associated RDoC dimensions and underlying interactions among genome-wide genetic variation and direct/indirect WTC exposure(s).

### 9/11 Trauma and Toxicity in Childhood: Longitudinal Health and Behavioral Outcomes

**Project Number:** U01 OH011308-01

**Institution:** New York State Psychiatric Institute at Columbia University

**Principal Investigator:** Christine Hoven, DrPH

**Phone Number:** (646) 774-6068

**Email:** [hoven@nyspi.columbia.edu](mailto:hoven@nyspi.columbia.edu)

**Project Duration:** 5 years

**Description:** The 9/11 Trauma and Toxicity in Childhood: Longitudinal Health and Behavioral Outcomes Study aims to understand the longitudinal, lifetime effects of 9/11 traumatic and toxic exposures on children's physical health and behavioral development, as they grow into adulthood.

This study follows a cohort of children exposed to 9/11 and assesses the longitudinal health effects of their toxic and traumatic exposures, and examines the interactions of these factors in their development. This will generate valuable information to guide both psychiatric and general medical care for children exposed to 9/11 while providing information relevant for youth exposed to other traumatic events.

### **Incidence, Latency, and Survival of Cancer Following World Trade Center Exposure**

**Project Number:** U01 OH011315-01

**Institutions:** Albert Einstein College of Medicine, Icahn School of Medicine at Mount Sinai, New York City Department of Health, New York State Cancer Registry

**Principal Investigators:** Charles B. Hall, Ph.D.; Paolo Boffetta, M.D., M.P.H.

**Phone Numbers:** (718) 430-3724 (Dr. Hall); (212) 824-7378 (Dr. Boffetta).

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**Project Duration:** 4 years

**Description:** Combining follow-up from all three cohorts of WTC rescue/recovery workers, this study will update estimates of the effect of WTC-exposure on cancer incidence, study in detail the latency period between exposure and cancer incidence, and study the effect of WTC-exposure and other prognostic factors on survival after cancer diagnosis in this population. This research will add to the understanding of long-term consequences of WTC-exposure, inform surveillance efforts in future environmental disasters, will stimulate further research into environmental risk factors for cancer in this and other cohorts, and will stimulate future work that would maximize survival of cancer patients among WTC-exposed workers.

### **Hepatitis C Virus Infection in WTC Responders**

**Project Number:** U01 OH011307-01

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigators:** Stephanie Factor, MD,

MPH; Paolo Boffetta, MD, MPH

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**Project Duration:** 2 years

**Description:** This study provides hepatitis C virus (HCV) screening to members of the WTC cohort followed at the Icahn School of Medicine at Mount Sinai (WTC Health Program) born during 1945–1965, and linkage to care for those found infected. In addition to identifying and treating HCV-infected individuals within the WTC Health Program, the study aims to identify undetermined risk factors for HCV infection experienced by WTC Health Program members, and factors associated with improved linkage to HCV care. These findings would be relevant to the larger US population, especially to persons born during 1945–1965 who are at high risk of HCV infection.

### **Structural and Functional Neuroimaging of Post-Traumatic Stress Disorder and Cognitive Impairment in World Trade Center Responders**

**Project Number:** U01 OH011314-01

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Roberto Lucchini, MD

**Phone Number:** (212) 824-7052

**Email:** [roberto.lucchini@mssm.edu](mailto:roberto.lucchini@mssm.edu)

**Project Duration:** 4 years

**Description:** The Stony Brook arm of the WTC Health Program screened 2,400 responders with the MoCA, observing a 2.6% moderate-to-severe Cognitive Impairment (scores <20), with significant association with WTC-PTSD. We will use functional MRI and PET/MRI imaging to examine these brain patterns among 120 SBU-WTC responders, including 30 with CI (MoCA <20, and PTSD; 30 with Cognitive Impairment without PTSD; 30 with normal cognitive functioning (MoCA>26) and PTSD; and 30 with normal cognitive functioning without PTSD. All responders will be matched on age and occupation as well as 30 non-WTC exposed, matched controls.

### Thyroid Cancer Risk in WTC Responders

**Project Number:** U01 OH010984-01A1

**Institutions:** Icahn School of Medicine at Mount Sinai, Johns Hopkins School of Medicine

**Principal Investigators:** Emanuela Taioli, MD, PhD, Gregory Riggins, MD, PhD

**Phone Number:** (212) 659-9590

**Email:** [emanuela.taioli@mountsinai.org](mailto:emanuela.taioli@mountsinai.org)

**Project Duration:** 3 years

**Description:** A statistically significant excess of thyroid cancer has been identified among WTC rescue and recovery workers included in the WTC Health Program at Mount Sinai in New York, and in two other cohorts, the WTC-exposed firefighters and the NYC Department of Health exposed residents. The objectives of this project are to

elucidate the reasons for the increased incidence of thyroid cancer among WTC Health Program participants, and to explore the behavior of these cancers. This project will investigate whether thyroid cancers among WTC Health Program participants differ from a clinical, epidemiologic and molecular viewpoint from thyroid cancers in WTC-unrelated patients.

### Assessing Inflammatory and Behavioral Pathways Linking PTSD to Increased Asthma Morbidity in WTC Workers

**Project Number:** U01 OH0 11312-01

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Juan Wisnivesky, MD, DrPH

**Phone Number:** (212) 824-7567

**Email:** [Juan.wisnivesky@mssm.edu](mailto:Juan.wisnivesky@mssm.edu)

**Project Duration:** 5 years

**Description:** Asthma and PTSD are the most common conditions in WTC rescue and recovery workers. In this study, we will evaluate the interplay of biological and behavioral mechanisms explaining the relationship of PTSD with increase asthma morbidity and adapt and pilot test a novel intervention to improve outcomes of WTC workers.

### Impact of WTC Dust on Immune Functions and Prostate Cancer Promotion

**Project Number:** U01 OH011328-01

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Stuart Aaronson, MD

**Phone Number:** (212) 659-5400

**Email:** [stuart.aaronson@mssm.edu](mailto:stuart.aaronson@mssm.edu)

**Project Duration:** 5 years

**Description:** This project addresses adverse health effects to WTC rescue and recovery workers of exposure to dust containing asbestos and other toxic components. Proposed studies would test mechanisms that may be responsible for the increased incidence of prostate cancer in exposed individuals using mouse genetic models. Immune and/or other biomarkers identified would also be applied in correlative studies with prostate tumors from WTC workers.

### **Roles for WTC Dust and DEP Co-pollutant in First Responder Cardiovascular Ailments**

**Project Number:** R01 OH010921-01A1

**Institution:** New York University School of Medicine

**Principal Investigator:** Mitchell Cohen, PhD

**Phone Number:** (845) 731 3527

**E-mail:** [cohenm01@nyumc.org](mailto:cohenm01@nyumc.org)

**Project Duration:** 4 years

**Description:** There is an elevated risk for development of atherosclerosis/CVD among first responders who were present at Ground Zero over the first 72 hours. It has yet to be established if WTC dusts were causative agents to alter heart/vascular functions or caused damage *in situ*, modulating the impact of other pollutants that were also present at high levels at Ground Zero. These rodent model studies — using relevant exposure scenarios mimicking mouth-breathing exposures/pollutant levels in that critical period — will help us better understand

the bases for the still-increasing incidence of cardiovascular anomalies reported in first responders.

### **Internet-Based Psychotherapies for PTSD Symptoms in WTC Responders**

**Project Number:** U01 OH010729-01A1

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Adriana Feder, MD

**Phone Number:** (212) 659-9145

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**Project Duration:** 3 years

**Description:** While CBT is the most effective and empirically supported of PTSD treatments, its provision to WTC workers who still suffer from clinically significant WTC-related PTSD is often limited by geographical distance, reduced availability of expertly trained therapists, and stigma associated with seeking mental health treatment. We will conduct a randomized controlled trial to assess the efficacy of Internet-based, therapist-assisted CBT in WTC rescue and recovery workers with clinically-significant PTSD symptoms, compared to a control intervention of Internet-based, therapist-assisted supportive counseling, and will evaluate genetic and epigenetic biomarker predictors and correlates of treatment response.

### **Personality-Informed Care Model for 9/11-Related Comorbid Conditions**

**Project Number:** U01 OH011321-01

**Institution:** State University of New York at Stony Brook

**Principal Investigator:** Roman Kotov, PhD

**Phone Number:** (631) 638-1923

**Email:** [roman.kotov@stonybrookmedicine.edu](mailto:roman.kotov@stonybrookmedicine.edu)

**Project Duration:** 5 years

**Description:** Co-occurrence of medical and psychiatric illness is very persistent and prevalent in WTC responders following the attacks of 9/11, impairing their daily functioning and treatment outcomes. For the first time, the proposed study will identify modifiable personality-informed risk factors, resilience characteristics, and mechanisms for maintenance of comorbid conditions, as well as propose, and test, using a proof-of-concept randomized control trial, a system of personality-informed interventions to improve care of vulnerable individuals. This study will inform planning of WTC Health Program services and patient care, and will advance science by helping to illuminate the etiology of complex comorbidities.

## WTC Research Cooperative Agreements Awarded in FY 2017

### Neuroimaging of Resilience in World Trade Center Responders: A Focus on Emotional Processing, Reward and Social Cognition

**Project Number:** U01 OH011473-01

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Adriana Feder, MD

**Phone Number:** (212)659-9145

**Email:** [adriana.feder@mssm.edu](mailto:adriana.feder@mssm.edu)

**Project Duration:** 4 years

**Description:** The ultimate goal of this study is to develop an integrative, data-driven model to examine how patterns of brain activation across functional domains give rise to distinct mechanisms underlying

resilience, and how these neural mechanisms interrelate with behavioral (e.g., emotion regulation, reward responses, social cognition) and psychosocial (e.g., coping self-efficacy, positive emotions, social connectedness) factors implicated in resilience. Results of this study will be used to inform personalized and targeted prevention and treatment approaches that bolster function of specific neural circuits and help promote psychological resilience in WTC and other disaster responders, as well as other populations of trauma survivors.

### Linking the Effects of 9/11 to Kidney Disease

**Project Number:** U01 OH011326-01A1

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Mary Ann McLaughlin, MD, MPH

**Phone Number:** (212) 241-3340

**Email:** [MaryAnn.McLaughlin@mountsinai.org](mailto:MaryAnn.McLaughlin@mountsinai.org)

**Project Duration:** 3 years

**Description:** This study focuses on the prevalence and identification of kidney disease among WTC Health Program patients and assessment of kidney disease in a multi-factorial manner. The first aim is to correlate kidney dysfunction with 9/11 exposure. Secondly, we propose that a well-established WTC-related condition, obstructive sleep apnea, is independently associated with kidney disease. Lastly, we would explore potential mechanisms and phenotypes of kidney disease in WTC Health program participants. Successful completion of the research would address a critical knowledge gap regarding risk of kidney damage among this group, and would inform future

mechanistic studies with the potential to impact prevention.

### **Hepatotoxic Exposures, Progressive Fatty Liver Disease (NASH), and Liver Cancer Risk in the World Trade Center Health Program General Responder Cohort**

**Project Number:** U01 OH011489-01

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Andrea Branch, PhD

**Phone Number:** (212) 659-8371

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**Project Duration:** 4 years

**Description:** This project will develop and use innovative and enabling digital technologies to provide the first systematic investigation of liver disease in a large cohort of WTC responders. WTC responders were exposed to many substances known to cause serious progressive liver disease in other populations and in animal models; and it is thus highly likely that the WTC attack exposed responders to hepatotoxins that caused liver damage. By uncovering previously unrecognized liver disease and by introducing new digital technology, this project is expected to improve the health of WTC responders and rescue workers and to advance computational methods for analyzing medical data.

### **Prenatal WTC Chemical Exposures, Birth Outcomes and Cardiometabolic Risks**

**Project Number:** U01 OH011299-01A1

**Institution:** New York University School of Medicine

**Principal Investigator:** Leonardo Trasande, MD

**Phone Number:** (646) 501-2520

**Email:** [trasal01@nyumc.org](mailto:trasal01@nyumc.org)

**Project Duration:** 4 years

**Description:** Effects of perinatal exposures to the World Trade Center (WTC) disaster have identified increases in adverse birth outcomes. The disaster also released large amounts of particulate matter, heavy metals and persistent organic pollutants, which have been associated with adverse birth outcomes and cardiometabolic risks later in life. If WTC exposures, chemical and psychological, are associated with these outcomes, the study findings could facilitate proactive interventions such as treatment with antihypertensive medications, which have been documented to prolong survival among adults with suboptimal cardiovascular profile.

### **Mortality among WTC Rescue and Recovery Workers**

**Project Number:** U01 OH011480-01

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Paolo Boffetta, MD

**Phone Number:** (212) 824-7378

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**Project Duration:** 4 years

**Description:** Preliminary analyses based on comparisons with the general population showed a reduced mortality among WTC rescue and recovery workers, which may be due to selection of healthy workers in the cohorts. We plan to perform a number of analyses of a combined database comprising three WTC cohorts to address the possible 'healthy worker effect' and to investigate whether there is any indication of a possible

effect of WTC exposure on mortality of these workers. The proposed research will provide strong evidence on the presence or absence of an association of WTC exposure and mortality among WTC workers, and will inform on the best methodology to quantitatively assess the effects of disasters on mortality of exposed individuals.

### **Metabolomics of World Trade Center-Lung Injury: Biomarker Validation, Longitudinal Assessment and Dietary Intervention**

**Project Number:** U01 OH011300-01A1

**Institution:** New York University School of Medicine

**Principal Investigator:** Anna Nolan, MD, MS

**Phone Number:** (212) 263-7283

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**Project Duration:** 4 years

**Description:** The adverse impact on quality of life and sizable cost of WTC-lung injury (WTC-LI) are public health concerns. We propose to Identify and Validate metabolic contributors of WTC-LI through comprehensive metabolomics profiling and integration of relevant clinical, environmental, and serum biomarkers. We propose to investigate targeted behavioral dietary modification to alter modifiable risk factors and metabolomic (scientific study of chemical processes involving metabolites) biomarkers that may mitigate disease severity and improve the health and well-being of WTC exposed patients.

### **Longitudinal Genome-wide Transcriptome Study of PTSD Symptom Change in WTC Responders**

**Project Number:** U01 OH011478-01

**Institution:** The Research Foundation for the State University of New York

**Principal Investigator:** Pei Fen Kuan, PhD

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**Project Duration:** 3 years

**Description:** The 9/11 World Trade Center terrorist attack was a massive disaster, resulting in long-term physical and psychological symptoms among responders, in particular PTSD and lower respiratory symptoms (LRS). The proposed study builds on an extensive pilot study by evaluating the association between change in gene expression and changes in PTSD and LRS symptom severity across an 18-month period, using cutting edge RNA-sequencing. By characterizing the transcriptome patterns and pathways for these symptoms, our goal is to shed light on the biological mechanisms underlying this comorbidity, which can help prevent the exacerbation of physical symptoms by intervening at the level of etiological pathway.

### **Early Detection of Hematologic Malignancies in New York City Firefighters Exposed To World Trade Center Dust after the 9/11 Attacks**

**Project Number:** U01 OH011475-01

**Institution:** Albert Einstein College of Medicine, INC.

**Principal Investigator:** Amit Verma, MD

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**Project Duration:** 3 years

**Description:** The overall goal of this project is early detection of blood cancers using a large repository of blood and serum samples from firefighters exposed to WTC disaster. Specifically, we will use proteomic analysis, flow cytometry and genomic sequencing to detect early signs of myeloma, chronic lymphocytic leukemia and myelodysplastic syndromes in these cases, to enable potentially disease altering therapeutic interventions for these cancers.

### **Pulmonary Diseases in WTC Workers: Symptoms, Function, and Chest CT Correlates**

**Project Number:** U01 OH010401-05

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Rafael de la Hoz, MD

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**Email:** [rafael.delahoz@mssm.edu](mailto:rafael.delahoz@mssm.edu)

**Project Duration:** 4 years

**Description:** The overall goal of this ongoing study is to characterize the WTC-related lower airway disorders, to investigate newly developed obesity-related imaging markers that may be associated with unfavorable disease expression and functional outcomes, and assess their interaction with WTC occupational exposure level. The WTC Pulmonary Evaluation Unit Chest CT Imaging Archive, a large database with more than 3000 chest CT images on 1700 WTC workers, operational since February 2016, will be utilized for this study. This study will characterize the WTC-related lower airway diseases and their most important adverse

prognostic risk factors, and evaluate lung function and imaging longitudinal trajectories. WTC Research Cooperative Agreements

## **WTC Research Cooperative Agreements Awarded in FY 2018**

### **Optimizing Lung Cancer Screening in World Trade Center Rescue and Recovery Workers**

**Project Number:** U01 OH011479-01 A1

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigators:** Keith Sigel, MD, PhD, and Juan Wisnivesky, MD, DrPH

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**Project Duration:** 3 years

**Description:** The goal of this study is to use simulation modeling to determine the best and most cost-effective screening and work-up regimens implementing low-dose computed tomography screening for lung cancer in WTC responders. The study findings will have direct implications on the adoption and implementation of this potentially life-saving intervention in a population exposed to multiple carcinogens during the recovery efforts following the WTC attack.

### **Exploring Mechanisms of Obstructive Sleep Apnea (OSA) in WTC Responders**

**Project Number:** U01 OH011481-01 A1

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigators:** Indu Ayappa, PhD and Jag Sunderram, MD

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**Project Duration:** 3 years

**Description:** There is a high prevalence of obstructive sleep apnea (OSA) in the WTC responder population with an increased risk for OSA in subjects with chronic rhinosinusitis. This study will examine the impact of upper airway sensory impairment from chronic rhinosinusitis as a potential mechanism for development of OSA in WTC responders. The study will also examine the contribution of other pathophysiologic mechanisms (impaired upper airway muscle responsiveness, low arousal threshold and loop gain) in the development of OSA that may be used to target therapeutic interventions in the future in this population.

### **Detection and Incidence of Thyroid Cancer among Three Cohorts of WTC Exposed Rescue and Recovery Workers**

**Project Number:** U01 OH011681-01

**Institution:** Albert Einstein College of Medicine, INC.

**Principal Investigator:** Rachel Zeig-Owens, DrPH

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**Project Duration:** 2 years

**Description:** World Trade Center (WTC)-exposed rescue/recovery workers have an elevated risk of thyroid cancer compared with the general United States population but to-date none of the compounds found at the WTC disaster site has been proven to be associated with thyroid cancer. Instead the elevated rate might be the result of incidental detection due to increased medical surveillance provided to the WTC-exposed

rescue/recovery workers. This study will investigate the method of detection of thyroid cancer among WTC-exposed rescue/recovery workers and a non-WTC exposed reference population to determine the rate of thyroid cancer cases diagnosed incidentally and to identify reasons for the elevated risk of thyroid cancer among WTC-exposed populations.

### **Informed/Shared Decision Making for Prostate Cancer Screening Among Members of the World Trade Center Health Program**

**Project Number:** U01 OH011690-01

**Institution:** Feinstein Institute for Medical Research

**Principal Investigator:** Michael Diefenbach, PhD

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**Project Duration:** 3 years

**Description:** Members of the WTCHP program are characterized by multiple physical and psychiatric comorbidities and are at an increased risk for cancer, especially for prostate cancer. Screening for prostate cancer is not part of the routine annual monitoring visit and thus the current study proposes to a) explore and develop a stepped approach to informed/shared decision making (SDM) about prostate cancer screening; b) evaluate the uptake of screening after informed/shared decision making during members' annual monitoring visits; c) evaluate factors related to uptake/rejection of screening and d) evaluate costs associated with screening. Results from this study have the potential to change clinical care for all members of the WTC Health Program by introducing and evaluating an informed/shared approach to decision making for cancer screening and to

ultimately reduce the cancer burden of this vulnerable population.

### **Chronic Obstructive Pulmonary Disease in WTC Workers – Diagnoses and Transitions**

**Project Number:** U01 OH011697-01

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Rafael de la Hoz, MD

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**Project Duration:** 3 years

**Description:** Utilizing an extensive amount of qualitative and quantitative imaging, clinical, and functional data, the overall goal of this study is to characterize the transitions over time into chronic obstructive pulmonary disease (COPD) among former workers and volunteers at the WTC disaster site, and examine the progression of the diagnosis, their radiographic imaging correlates, and the contribution of work-related exposures to disease causation.

### **World Trade Center tissue Biobank**

**Project Number:** U01 OH011704-01

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Emanuela Taioli, MD, PhD

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**Project Duration:** 3 years

**Description:** There has been concern about the increase cancer incidence among the World Trade Center (WTC) responders; this

project will update the WTC tissue bank system with the newly diagnosed cancers (2010-2014), and to add the banking of organs and tissues from animal studies exposed to the WTC dust. The biobank will provide the necessary infrastructure for addressing questions such as the link between specific carcinogens exposures and certain cancer sites, molecular signatures of exposure that could be linked to cancer, specific markers of tumor aggressiveness among WTC responders.

### **Development and Implementation of a Comparison Occupational Cohort for the WTC GRC**

**Project Number:** U01 OH011487-01-A1

**Institution:** Icahn School of Medicine at Mount Sinai

**Principal Investigator:** Susan Teitelbaum, PhD

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**Project Duration:** 3 years

**Description:** This project arises from the need to have a valid occupational comparator cohort against which the health data from the WTC first responders might be measured. To date, very few analyses have utilized occupational cohorts as comparison groups when estimating the risk of exposure to 9/11 toxins and stressors. The goal is to create a cohort that is as similar as possible to the first responders with the exception of 9/11 exposure. At a minimum, the similarities would include occupation, age, sex, and race/ethnicity that will result in more accurate and valid estimates of disease risk amongst the first responders.

**Title: Multimodal Neuroimaging of Cognitive and Emotional Networks in Young Adults Exposed to 9/11 as Children****Project Number:** 1 U01 OH011694-01**Institution:** New York State Psychiatric Institute**Principal Investigator:** Yael Cycowicz, PhD**Phone Number:** (646)-774-5837**Email:** [Yael.Cycowicz@nyspi.columbia.edu](mailto:Yael.Cycowicz@nyspi.columbia.edu)**Project Duration:** 3 years

**Description:** Understanding the patterns of brain functioning of individuals exposed to 9/11 as children is essential to safeguarding their mental health. This study will assess brain structure and function in 3 adult groups who were children at 9/11: 1) Highly Exposed to 9/11 with Anxiety Disorders; 2) Highly Exposed to 9/11 without Anxiety Disorders; 3) No Exposed and No Mental Disorders. These findings will improve our understanding of emotional, memory and cognitive systems, which are sensitive to traumatic stress during development, and will inform the trajectory of psychiatric disorders and could guide preventative and treatment strategies for children exposed to trauma.