

# Motor and Cognitive Health Outcomes in a Mn-Exposed African Community

<https://neurodegenerationresearch.eu/survey/motor-and-cognitive-health-outcomes-in-a-mn-exposed-african-community/>

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## Contact information of lead PI Country

USA

## Title of project or programme

Motor and Cognitive Health Outcomes in a Mn-Exposed African Community

## Source of funding information

NIH (NINDS)

## Total sum awarded (Euro)

€ 3,433,477.98

## Start date of award

01/08/2015

## Total duration of award in years

4

## The project/programme is most relevant to:

Parkinson's disease & PD-related disorders

## Keywords

Manganese, African, Motor, Cognitive, South Africa

## Research Abstract

? DESCRIPTION (provided by applicant): Manganese (Mn) is an established neurotoxicant with complex pharmacology, due to its role as an essential trace element. This proposal builds on a

large body of research generated by our investigative team over the last decade. In these studies, we have demonstrated that: Mn-exposed welders have a high prevalence of parkinsonism compared to a reference population; the phenotype of parkinsonism in Mn-exposed workers overlaps substantially with the phenotype seen in Parkinson disease (PD); Mn-exposed workers have presynaptic dopaminergic dysfunction, thereby linking Mn exposure to the same pathways involved in PD; and there is an increased risk of PD in regions of the U.S. with high industrial Mn emissions. In this proposal, we will perform a population-based epidemiology study of Mn-exposed adults living near a large Mn smelter in Meyerton, South Africa, and of a non-exposed reference community in Kroonstad, South Africa, in which we will compare the prevalence and severity of motor, cognitive control, and mood dysfunction between the two communities. Within the Mn-exposed Meyerton community, we will also investigate the dose-response relationship between environmental Mn exposure and these health outcomes. Our preliminary data clearly support the hypotheses we propose to test and demonstrate that the proposed work is feasible. Our research team is ideally suited to conduct these studies and includes world experts in clinical assessment of Mn neurotoxicity, environmental pollution modeling, and epidemiology. The mixed-race (black and white) South African community to be studied will provide a unique opportunity to investigate racial differences to sensitivity to Mn. Demonstrating motor and cognitive health effects from ambient Mn at exposure levels below the current Environmental Protection Agency lowest observed adverse effect level will have a substantial public health impact by informing environmental regulatory policy in the United States and worldwide.

### **Lay Summary**

**PUBLIC HEALTH RELEVANCE:** In this application, we propose to investigate the motor, cognitive, and mood health effects associated with environmental manganese (Mn) exposure from a Mn smelter in a mixed-race South African community. This study will build substantially on prior work by us and others toward understanding the health effects of a common environmental exposure found in all regions of the U.S. and will inform environmental regulatory policy.

### **Further information available at:**

#### **Types:**

Investments > €500k

#### **Member States:**

United States of America

#### **Diseases:**

Parkinson's disease & PD-related disorders

#### **Years:**

2016

#### **Database Categories:**

N/A

#### **Database Tags:**

N/A