**Center for Air Quality and Human Health: Generational and Transgenerational Impacts on One Health**

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**Total Amount Requested**: $2,201,244

Our currently funded Tier One Program (TOP) grant supports integrated interdisciplinary education and research for undergraduate and graduate students regarding a major human health issue facing our world today–generational and transgenerational effects of air pollutants. We now propose to establish infrastructure for a Center of Air Quality and Health for research and graduate education in air pollution using animal models and human tissues for studies of effects of exposure to multiple pollutants under atmospherically relevant conditions. Our multi- and inter-disciplinary Center will integrate research into: 1) atmospheric chemistry modeling and monitoring; 2) health risks of air pollutants using animal models and human tissues in a “Systems Biology” approach to assess genomic and epigenomic effects on the cardiovascular, pulmonary, reproductive, neurological and immunological systems; 3) epidemiological studies of air pollutants on human health; and 4) societal impacts and public policy relevant to air pollution. The Center will address four scientific priorities of the Environmental Protection Agency (EPA) and National Institutes of Health (NIH) regarding the dynamics of a multi-pollutant environment that include: 1) atmospheric chemistry, modeling, and monitoring; 2) a systems biology approach to understanding adverse health effects linked to exposure to single and multi-pollutants in response to climate change; 3) generational and transgenerational effects of air pollutants on the genome and epigenome; 4) epidemiological studies of effects of air pollutants on human health including exposure/concentration-response relationships for particulate matter and ozone; and 5) societal and public policy issues relevant to management of air quality. Key goals include establishment of a TAMU Center to serve a geographic region not currently covered by EPA and NIH for research on genomic and epigenomic consequences of air pollutants on human health.