Research Development Fund – FALL FY17 Cover Page Template
SUBMISSION DEADLINE: September 12, 2016 at 12 noon CDT to rdf@tamu.edu
(All cover pages will be posted for the campus community to view at http://rdf.tamu.edu/abstracts)

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

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Key Participating Units: Bush School of Government and Public Service; College of Agriculture and Life Sciences/Texas A&M AgriLife; Colleges of Science, Geosciences, Veterinary Medicine and Biomedical Sciences and Medicine; Dwight Look College of Engineering; School of Public Health

Anticipated Request Amount ($): $2,000,000

Executive summary of the intended application to utilize Research Development Funds. *Include the overall scope/objective of the application. What research infrastructure enhancement is proposed? How will research at Texas A&M be improved? Who (units) will benefit at the Brazos County locations? How will external funding be enhanced? What outcomes are anticipated? Explain clearly how this investment supports TAMU research infrastructure for broad campus benefit.*
(See RFA and Application template.)

Particulate matter pollutants such as sulfate, nitrates, and black carbon penetrate deep into the lungs and into the cardiovascular system, posing the greatest risks to human health. According to a latest World Health Organization (WHO) Report, air pollution causes more than 3 million deaths a year and is now the biggest single killer in the world; the toll is expected to double by 2050 as populations increase. Our previously 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 propose to establish the 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. Specifically, the Center will address the 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 that is not currently covered by EPA and NIH for research on genomic and epigenomic consequences of air pollutants on human health.