"Metabolic Syndrome Associated Susceptibility to Nanoparticle Inhalation“

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Abstract: Metabolic Syndrome (MetS) is increasingly prevalent within our society and growing evidence suggests that individuals with these chronic diseases, such as MetS, respond more robustly to exposures. Specifically, MetS is associated with dyslipidemia which may alter the regulation of inflammation following exposures. We hypothesize that MetS-associated dysregulation of lipids contributes to exacerbated inflammatory responses following exposures due to alterations in specialized pro-resolving mediators of inflammatory resolution. Our current study, uses a human-relevant nanoparticle to evaluate pulmonary inflammation in a mouse model of diet-induced MetS. Further, precursors of specialized pro-resolving mediators were utilized as interventions to examine resolution pathways responsible for exacerbations of inflammation in MetS. Our findings demonstrate that lipid dysregulation enhances acute inflammatory responses and these exacerbations can be inhibited via supplementation with precursors of specialized pro-resolving mediators. A detailed understanding of common subpopulation susceptibility to exposures is necessary for the development of comprehensive public health policy and understanding of disease progression.