European Respiratory Society
Annual Congress 2013

Abstract Number: 1428
Publication Number: P649

Abstract Group: 3.3. Mechanisms of Lung Injury and Repair
Keyword 1: Air pollution **Keyword 2:** Inflammation **Keyword 3:** Immunology

Title: Expression of PU.1 and autophagy of the macrophages treated with graphene oxide and their reductives

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Body: Background: The graphene which is an allotrope of carbon has the honeycombing structure of one-atom-thick planar sheets. It can be produced by chemical vaporization device. For its unique chemicophysical properties, it is one of vast utilized material in 21th century in modern electronic, informatice technologies including medical device. Thus biohazards of graphene must be evaluated for industry people. We studied defining the graphene induced effects on immunologic function through investigation of PU.1, Autophagy of macrophages treated with graphene oxide and their reductives. Materials and Methods: Raw264.7 cells were cultured in DMEM(Dulbecco's Modified Eagle's Medium) with 10% fetal bovine serum. Graphene oxide(GO), reduced GO, sodium dodecyl amine GO and hydrazine amine GO. MTT was performed for cell proliferation assay. Western blots were done for expression of PU.1 and LC3B-I/LC3B-II. Results: R-GO, SDS-GO, DA-GO inhibited the proliferation of Raw264.7 cells but not GO in 24, 48 and 72 hours of treating duration. Those inhibition showed concentration-dependent manner. PU.1 expression was decreased with treatment of 4 forms of GO. Autophagy checked by conversion from LC3B-I to LC3B-II was induced by all the forms of GO. Conclusion: GO and its derivatives can inhibit proliferation and induce autophagy of macrophages. They also suppress expression of PU.1. Further evaluation for association between PU.1 and autophagy may be necessary. Acknowledgement: This research was supported by Mid-career Research Program (2011-0028752) through the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology.