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Title: Neovascularisation in asthma: Altered angiogenic potential of ASM cells from asthmatic patients

Ms. Laura 2634 Keglowich laura.keglowich@unibas.ch [1], Prof. Michael 2638 Roth rothmic@uhbs.ch [1], Dr. Maria 2635 Philippova maria.filippova@unibas.ch [2], Prof. Thérèse J. 2636 Resink therese-j.resink@unibas.ch [2], Prof. Michael 2637 Tamm mtamm@uhbs.c MD [1] and Dr. Peter 2639 Borger pieter.borger@unibas.ch [1]. [1] Pulmonary Cell Research & Pneumology, University Hospital, Basel, Switzerland, 4031 and [2] Signal Transduction, Department Biomedicine, University Hospital, Basel, Switzerland, 4031 .

Body: Background: Airway remodeling is a key pathology in asthma with increasing changes of the airway wall structure, including thickening of airway smooth muscle (ASM) bundles and increased vascularisation. ASM cells require oxygen and nutritions which are delivered via blood vessels. Understanding the mechanism of neo-vascularisation may therefore lead to novel strategies to counteract remodeling. Methods: The capacity of ASM cells of asthmatics and non-asthmatics to induce sprouting was determined with a sprouting assay. To get broad insight into the factors which may be involved we used an angiogenesis array. Some of the 43 analyzed proteins are of further interest and their concentration was measure by ELISA. Results: Conditioned Medium (CM) from ASM cells was applied to a spheroid assay. In this assay the CM of ASM cells derived from asthmatics lead to more sprout outgrowth compared to CM derived from controls. Analyzing the CM with an commercial available angiogenesis array revealed that several angiogenic factors are elevated. The CXC-Chemokines ENA-78, GRO-alpha and IL-8 have been further analyzed by ELISA and were confirmed to be upregulated in asthmatics. Conclusion: Our results indicate that the angiogenic potential of ASM cells from asthmatic patients is higher compared to that of control cells. The ELR-motif-containing chemokines ENA-78, GRO-alpha and IL-8 are upregulated in asthmatics and might therefore contribute to neo-vascularisation. Counteracting this process may lead to novel asthma therapies. Supported by SNF 320030_124905/1.