

Generation of a lentivirus expression system to study role of peroxisome proliferator receptor gamma (PPAR γ) in alveolar macrophages

A. D. Armstrong¹, M. R. Barrett¹, G. Wells², M. S. Kavuru¹, M J. Thomassen^{1,2} and A.G. Malur²

¹ Dept. of Internal Medicine, Division of Pulmonary and Critical Care Medicine, &

²Dept. of Microbiology and Immunology, Brody School of Medicine, East Carolina University, Greenville, North Carolina, USA 27834

The use of lentivirus expression system for gene delivery has gained a significant interest due to its rapid, stable and long-term gene expression into a wide variety of cell types. Herein, we have utilized this system to successfully generate a lentivirus, (L-PPAR γ), which expresses human PPAR γ , a transcription factor of the nuclear hormone receptor superfamily which is involved in insulin resistance and macrophage foam cell formation. Transduction of L-PPAR γ into a variety of cell types including alveolar macrophages isolated from GM-CSF knockout mice and human bronchoalveolar lavage led to an efficient expression of PPAR γ as confirmed by immunofluorescence microscopy. Moreover, real time PCR analysis revealed a dramatic increase (6.1 fold) in expression level of ABCG1 (ATP-binding cassette G1), a gene involved in lipid metabolism, suggesting that ABCG1 may be regulated by PPAR γ . Additional data obtained from immunofluorescence microscopy together with Western blot analysis of HeLa cells confirmed the intranuclear localization of PPAR γ . These results demonstrate that this system provides a reliable and invaluable approach to study gene expression. Further experiments are currently underway to characterize the role of PPAR γ in lung biology.