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miR-144-3p is a biomarker related to severe corticosteroid-dependent asthma.

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Abstract

Background MicroRNAs are noncoding molecules that act both as regulators of the epigenetic landscape and as biomarkers for diseases, including asthma. In the era of personalized medicine there is a need for novel disease-associated biomarkers that can help in classifying diseases into phenotypes for treatment selection. Currently, severe eosinophilic asthma is one of the most widely studied phenotypes in clinical practice, as many patients require higher and higher doses of corticosteroids, which in some cases fail to achieve the desired outcome. Such patients may only be benefit from alternative drugs such as biologics, for which novel biomarkers are necessary. *Methods* MiR-144-3p was evaluated in airway biopsies and serum from asthmatics and healthy individuals. mRNA was studied in asthmatic biopsies and smooth muscle cells transfected with miR-144-3p mimic. *In silico* regulation of miR-144-3p was performed using miRSystem, miRDB, STRING and ShinyGO for pathway analysis. *Results* We found that miR-144-3p is a biomarker associated to asthma severity and corticosteroid treatment. MiR-144-3p is increased in asthmatic lungs and its presence correlates directly with blood eosinophilia and with the expression of genes involved in asthma pathophysiology in the airways. When studied in serum, this miRNA was increased in the severe asthmatics and associated with higher doses of corticosteroids, thereby making it a potential biomarker for severe asthma previously treated with higher doses of corticosteroids. *Conclusion* MiR-144-3p is associated with severe disease in both the airways and serum of asthmatics, and this association is related to corticosteroids treatment.

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Figure 1

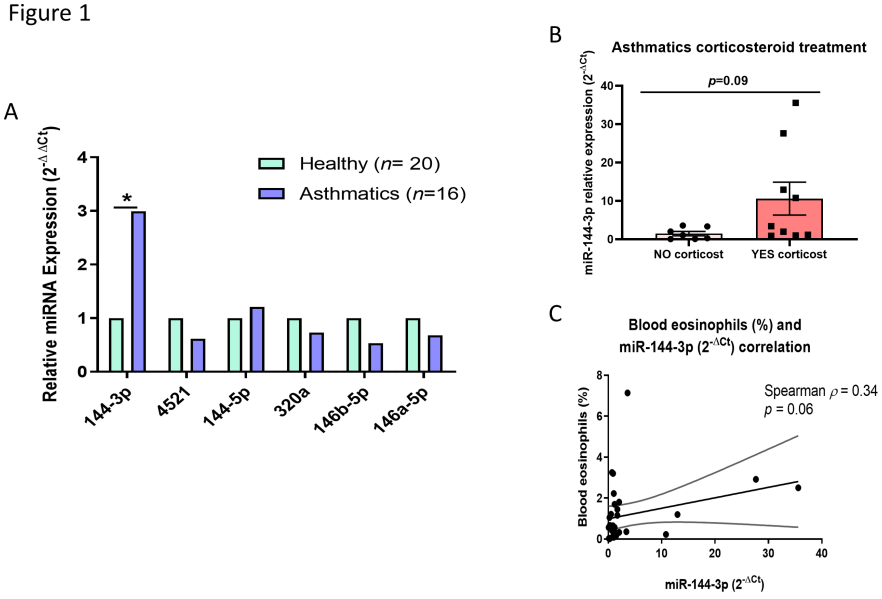

Figure 2

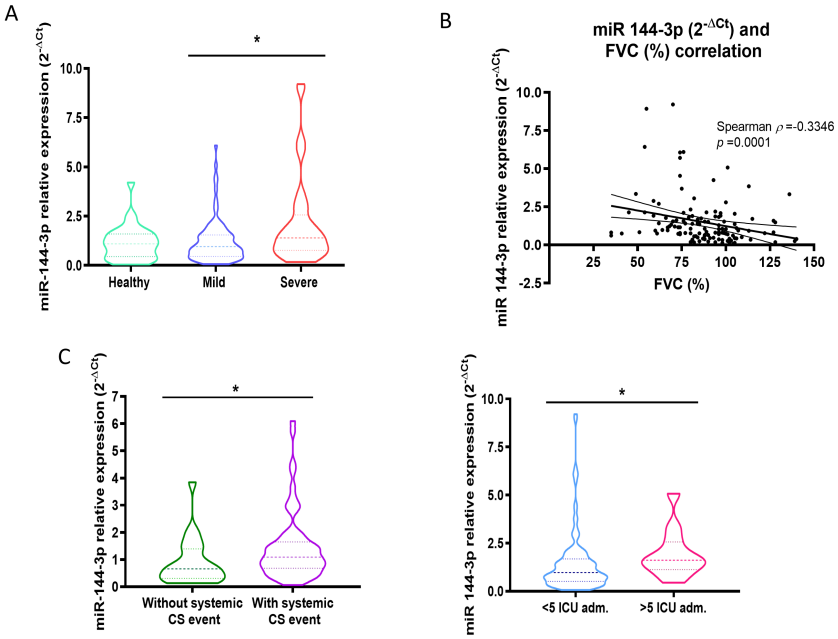

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Figure 3

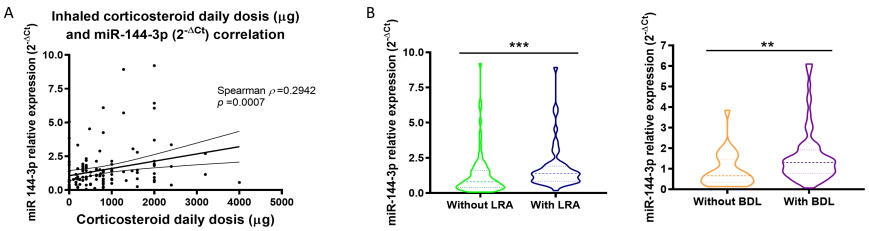


Figure 4

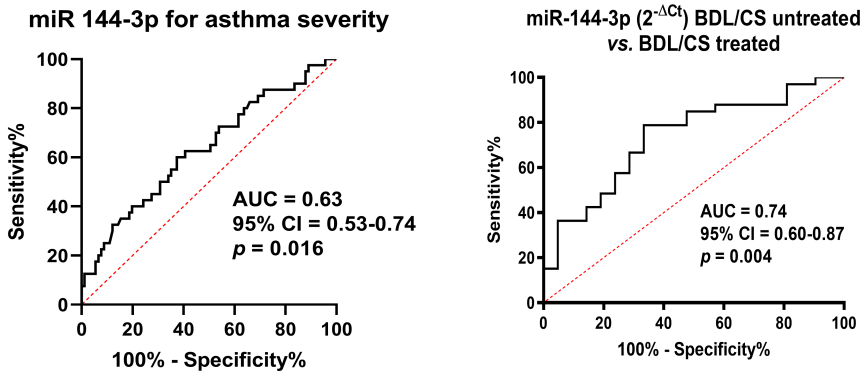
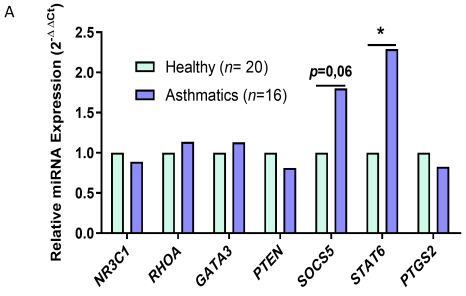


Figure 5



B

		NR3C1	RHOA	GATA3	STAT6	SOCS5	PTEN
hsa-miR-144-3p	Pearson *r*	0.60	0.61	0.70	0.69	0.65	0.76
	p value	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01