Expression of microRNA miR-205 in Pulmonary Squamous Cell Carcinoma and Adenocarcinoma

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Background

Lung cancer represents a heterogeneous group of tumors comprised of mostly squamous cell carcinomas (SCC) and adenocarcinomas (AD). These tumors can be challenging to classify due to heterogeneity, sampling, and lack of differentiation. Targeted molecular therapies for lung cancer treatment require accurate classification for optimal response. MicroRNAs (miRNAs) are endogenous, non-coding RNAs with critical functions on gene regulation. microRNA expression profiles have great potential in tumor diagnosis and prognosis since they play essential roles in tissue differentiation during normal development and oncogenesis. miR-205 has been shown to regulate E-cadherin and possibly target PTEN, and thus have role in tumor supressor function. The purpose of this study is to explore the utility of miR-205 expression in distinguishing SCC and AD.

Design

Samples of 40 formalin-fixed paraffin-embedded lung cancers (20 AD; 20 SCC) were classified using H&E staining and IHC using anti-TTF1 (BioGenex, BGX397A) and anti-p63 (BioGenex, AM418) antibodies. 5 normal lung samples served as controls.

Design

FAM-labeled miR-205 (BioGenex, HM205) and One-step ISH Detection Kit (BioGenex, DF400) were used in this study. The staining results were independently reviewed by pathologists to render diagnostic impression.

Results

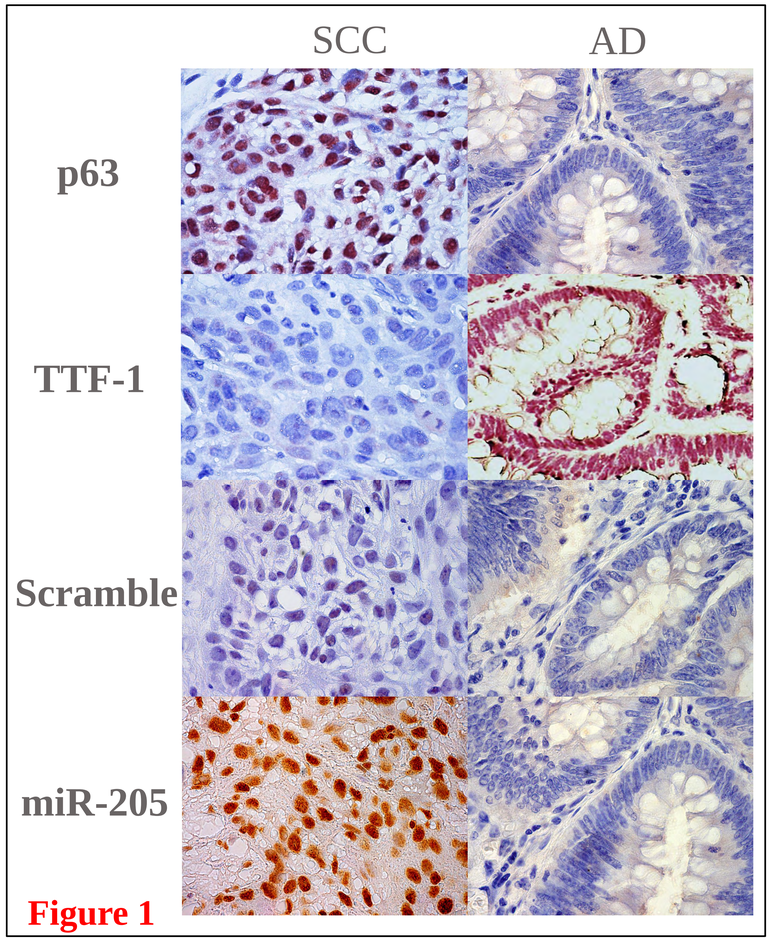

Figure 1

Results

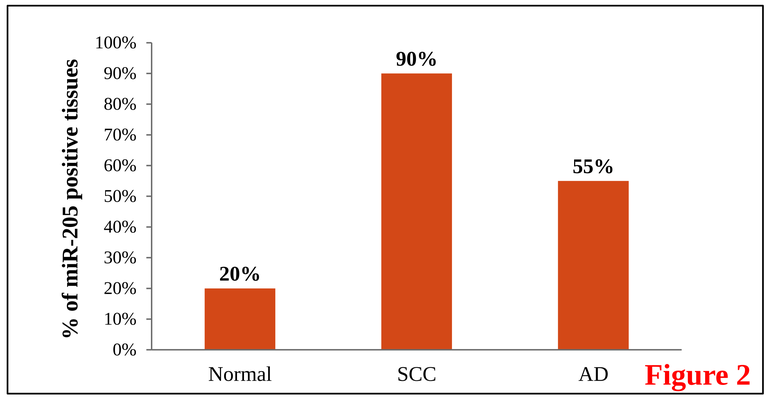

Figure 2

Figure 1. The staining of representative SCC and AD tissues using either anti-p63/anti-TTF1 antibody or scramble/miR-205 probe.
Figure 2. The percentage of miR-205 positive tissues in normal, SCC or AD lung tissues.

Using miRNA *in situ* hybridization system, we found that miR-205 was up-regulated in 18/20 (90%) of lung SCC and 11/20 (55%) of AD. Also there was a greater number of miR-205 positive cells in lung SCC.

Conclusion

This result suggests miR-205 may have the potential to differentiate SCC from AD. Additional studies are in progress to determine the utility of miR-205 expression in differentiating sub-types of lung cancer. Importantly, microRNAs may be utilized as a diagnostic tool in lung cancer classification.