

The Human SNHG21 Locus Contains a Novel microRNA: Bioinformatics and Experimental Evidences

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DOI: 10.21859/mci-supp-20

Keywords:

Bioinformatics
microRNA
Next Generation Sequencing

Abstract

Introduction microRNAs (miRNAs) have critical roles in tumorigenesis and cancer metastasis. Despite the importance of these small molecules, considerable number of miRNAs have not been identified or experimentally validated yet. There are different approaches for miRNA discovery and next generation sequencing (NGS) is one of the newest and most sensitive approaches. In the current study, we employed bioinformatics tools to re-analyze NGS data obtained from a study by Ryu et al. (PMID: 21346806) and then tried to experimentally validate a novel candidate miRNA: miR-B6.

Materials and Methods: Several online software's were employed for bioinformatics confirmation. A candidate pri-miRNA sequence was then cloned in an expression vector and transfected into the AGS cells (a gastric cancer cell line). After over-expression, cells were harvested, RNAs were isolated and cDNAs were synthesized. Real-time PCR by specific primers was applied for detection of the mature form of the candidate miRNA.

Results: Bioinformatics verification showed that the sequence of candidate miR-B6 is located within human SNHG21 gene which encodes a long non-coding RNA. miR-B6 sequence is an eminently conserved one in different species and nearly all examined softwares predict this miRNA as a real microRNA. Transfection of the candidate pri-miRNA sequence yielded in a detection of the mature form of miR-B6 in AGS cells.

Conclusions: Our preliminary data shows that this candidate pri-miRNA can be processed in cells yielding a novel mature miRNA. Further experiments need to be performed to elucidate the functional roles of this miRNA in cancer cells.