Atlas of Genetics and Cytogenetics in Oncology and Haematology

OPEN ACCESS JOURNAL

INIST-CNRS

Gene Section
Short Communication

MIR200A (microRNA 200a)

Yaguang Xi, Hong Chang

Mitchell Cancer Institute, University of South Alabama, USA. xi@health.southalabama.edu; hchang@health.southalabama.edu

Published in Atlas Database: August 2015

Online updated version : http://AtlasGeneticsOncology.org/Genes/MIR200AID53347ch1p36.html

Printable original version : http://documents.irevues.inist.fr/bitstream/handle/2042/62939/08-2015-MIR200AID53347ch1p36.pdf

DOI: 10.4267/2042/62939

Abstract

Review on MIR200A, with data on RNA, and where it is implicated.

Keywords: MIR200A

Identity

HGNC (Hugo): MIR200A

Location: 1p36.33

Note

MicroRNA 200a belongs to microRNA 200 family. MicroRNA 200 family consists of five microRNAs, microRNA 200b, microRNA 200a, microRNA 429, microRNA 200c and microRNA 141. MicroRNA 200b, microRNA 200a and microRNA 429 were transcribed as a single ploycistronic transcript from chromosome 1. And microRNA 200 family were demonstrated important roles in EMT (epithelial-mesenchymal transition) progress.

DNA/RNA

Description

microRNA 200a located in chromosome 1 and microRNA 200a was transcribed with microRNA 200b and microRNA 429 as a ploycistronic transcript. The putative transcription start site locates about 4987 bp upstream of the precursor of microRNA 200a.

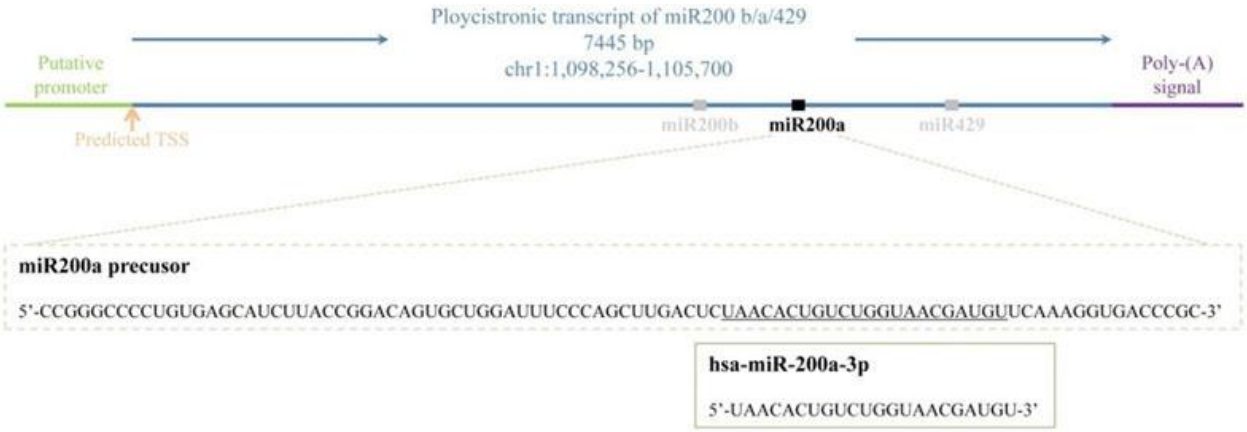
Transcription

MiR-200a precursor: 5'-CCGGGCCCCUGUGAGCAUCUUACCGGACAGUGCUGGAUUUCCCAGCUUGACUCUAACACUGUCUGGUAACGAUGUUCAAAGGUGACCCGC-3'

Mature miR-200a: 5'-UAACACUGUCUGGUAACGAUGU-3'

Pseudogene

No pseudogene was found.



Protein

Note
microRNAs are not translated into proteins.

Implicated in

Tumor cell proliferation

MiR-200a showed its roles in regulation of tumor cell proliferation.
In human endometrial adenocarcinoma cell line HEC-1B, repression of miR-200a could increase the tumor suppressor gene PTEN and thus inhibit cell proliferation and promote cell apoptosis, which showed the oncogenic role of miR-200a (Li, He et al. 2014). However, studies in breast cancer also demonstrated that miR-200a could attenuate cell proliferation by targeting Mitochondrial Transcription Factor A (Yao, Zhou et al. 2014). As well, miR-200a was also proved to impair glioma cell growth by targeting SIM2-s (Su, He et al. 2014).

Tumor cells invasion and cancer metastasis

As a member of miR-200 family, miR-200a showed its regulation roles in cancer cells invasion and migration.
By targeting SIM-2, miR-200a could inhibit glioma cell migration and invasion (Su, He et al. 2014). In CD133/1+ ovarian cancer stem cells, miR-200a could inhibit cell migration and invasion by repressing expression of Zeb2 (which is a repressor of E-cadherin) (Wu, Guo et al. 2011). However, in human breast cancer cells, it was found that miR-200a could target YAP1 thus induce anoikis resistance and metastasis (Yu, Hu et al. 2013).

Repression of epithelial-mesenchymal transition (EMT)

Roles of miR-200 family in EMT regulation were intensively studied. As miR-200a, it was reported that miR-200a could regulate EMT by targeting SIRT1 and mammary epithelial cells (Eades, Yao et al. 2011). In hepatic oval cells, downregulation of miR-200a induces EMT phenotypes and CSC-like signatures by directly targeting beta-catenin (Liu, Ruan et al. 2013).

References

Eades G, Yao Y, Yang M, Zhang Y, Chumsri S, Zhou Q. miR-200a regulates SIRT1 expression and epithelial to mesenchymal transition (EMT)-like transformation in mammary epithelial cells. J Biol Chem. 2011 Jul 22;286(29):25992-6002

Li R, He JL, Chen XM, Long CL, Yang DH, Ding YB, Qi

HB, Liu XQ. MiR-200a is involved in proliferation and apoptosis in the human endometrial adenocarcinoma cell line HEC-1B by targeting the tumor suppressor PTEN. Mol Biol Rep. 2014;41(4):1977-84

Liu J, Ruan B, You N, Huang Q, Liu W, Dang Z, Xu W, Zhou T, Ji R, Cao Y, Li X, Wang D, Tao K, Dou K. Downregulation of miR-200a induces EMT phenotypes and CSC-like signatures through targeting the β-catenin pathway in hepatic oval cells. PLoS One. 2013;8(11):e79409

Su Y, He Q, Deng L, Wang J, Liu Q, Wang D, Huang Q, Li G. MiR-200a impairs glioma cell growth, migration, and invasion by targeting SIM2-s. Neuroreport. 2014 Jan 8;25(1):12-7

Wu Q, Guo R, Lin M, Zhou B, Wang Y. MicroRNA-200a inhibits CD133/1+ ovarian cancer stem cells migration and invasion by targeting E-cadherin repressor ZEB2. Gynecol Oncol. 2011 Jul;122(1):149-54

Yao J, Zhou E, Wang Y, Xu F, Zhang D, Zhong D. microRNA-200a inhibits cell proliferation by targeting mitochondrial transcription factor A in breast cancer. DNA Cell Biol. 2014 May;33(5):291-300

Yu SJ, Hu JY, Kuang XY, Luo JM, Hou YF, Di GH, Wu J, Shen ZZ, Song HY, Shao ZM. MicroRNA-200a promotes anoikis resistance and metastasis by targeting YAP1 in human breast cancer. Clin Cancer Res. 2013 Mar 15;19(6):1389-99

This article should be referenced as such:

Xi Y, Chang H. MIR200A (microRNA 200a). Atlas Genet Cytogenet Oncol Haematol. 2016; 20(6):322-323.