Storey J. D., Tibshirani R. 2003. Statistical significance for genomewide studies. Proc. Natl. Acad. Sci. USA. V. 100. P. 9440.

Teng Y., Fan Y., Ma J., Lu W., Liu N., Chen Y., Pan W., Tao X. 2021. The PI3K/Akt pathway: Emerging roles in skin homeostasis and a group of non-malignant skin disorders. Cells. V. 10. P. 1219. https://doi.org/10.3390/cells10051219

Toda H., Kurozumi S., Kijima Y., Idichi T., Shinden Y., Yamada Y., Arai T., Maemura K., Fujii T., Horiguchi J., Natsugoe S., Seki N. 2018. Molecular pathogenesis of triple-negative breast cancer based on microRNA expression signatures: Antitumor miR-204-5p targets AP1S3. J. Hum. Genet. V. 63. P. 1197.

Toll A., Salgado R., Espinet B., Díaz-Lagares A., Hernández-Ruiz E., Andrades E., Sandoval J., Esteller M., Pujol R.M., Hernández-Muñoz I. 2016. MiR-204 silencing in intraepithelial to invasive cutaneous squamous cell carcinoma progression. Mol. Cancer. V. 15. P. 53. https://doi.org/10.1186/s12943-016-0537-z

Vergani E., Dugo M., Cossa M., Frigerio S., Di Guardo L., Gallino G., Mattavelli I., Vergani B., Lalli L., Tamborini E., Valeri B., Gargiuli C., Shahaj E., Ferrarini M., Ferrero E. et al. 2020. miR-146a-5p impairs melanoma resistance to kinase inhibitors by targeting COX2 and regulating NFkB-mediated inflammatory mediators. Cell Commun. Signal. V. 18. P. 156. https://doi.org/10.1186/s12964-020-00601-1

Vitiello M., Tuccoli A., D'Aurizio R., Sarti S., Giannecchini L., Lubrano S., Marranci A., Evangelista M., Peppicelli S., Ippolito C., Barravecchia I., Guzzolino E., Montagnani V., Gowen M., Mercoledi E. et al. 2017. Context-dependent miR-204 and miR-211 affect the biological properties of amelanotic and melanotic melanoma cells. Oncotarget. V. 8. P. 25395. https://doi https://doi.org/10.18632/oncotarget.15915

Xia Y., Zhu Y., Ma T., Pan C., Wang J., He Z., Li Z., Qi X., Chen Y. 2014. miR-204 functions as a tumor suppressor by regulating SIX1 in NSCLC. FEBS Lett. V. 588. P. 3703.

Xiao B., Zhu E.D., Li N., Lu D.S., Li W., Li B.S., Zhao Y.L., Mao X.H., Guo G., Yu P.W., Zou Q.M. 2012. Increased miR-146a in gastric cancer directly targets SMAD4 and is involved in modulating cell proliferation and apoptosis. Oncol. Rep. V. 27. P. 559.

Yang C., Tian C., Hoffman T.E., Jacobsen N.K., Spencer S.L. 2021. Melanoma subpopulations that rapidly escape MAPK pathway inhibition incur DNA damage and rely on stress signalling. Nat. Commun. V. 12. P. 1747. https://doi.org/10.1038/s41467-021-21549-x

Zhang B., Pan X., Cobb G.P., Anderson T.A. 2007. microRNAs as oncogenes and tumor suppressors. Dev. Biol. V. 302. P. 1.

Zhao J., Sun Y., Lin H., Chou F., Xiao Y., Jin R., Cai X., Chang C. 2020. Olaparib and enzalutamide synergistically suppress HCC progression via the AR-mediated miR-146a-5p/BRCA1 signaling. FASEB J. V. 34. P. 5877.

Change of microRNA Profile in Melanoma Cells Resistant to Dacarbasine

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It is known that microRNAs are capable for regulating the onset and development of tumor growth by altering the gene expression within a specific signaling pathways. Drug resistance is crucial for tumor progression since chemotherapeutic agents can affect the cell cycle, DNA replication resulting both genetic and epigenetic changes in survived cells. In this regard, the purpose of this study was to determine the microRNAs profile and cell cycle alteration in melanoma cells after chemotherapeutic agent dacarbazine treatment or after dacarbazine treatment followed by microRNA miR-204-5p mimic transfection. Dacarbazine led to increase in the proportion of cells in M phase, as well as to changes in the expression of microRNAs. MiR-146a-5p and miR-21-5p levels were one of the most downregulated which are according to bioinformatic analysis, take part cancer cell chemoresistance.

Keywords: melanoma, microRNA, miR-204-5p, miR-146a-5p, microarray, cell cycle, dacarbazine, drug resistance