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PLATELET microRNA-27 EXPRESSION IN PATIENTS WITH VARIOUS ONCOPATHOLOGIES BEFORE AND AFTER SURGERY

Dremuk I.A.[1], Pashinskaya E.S[2], Shliakhtunou, Y. A.[2], Sveshnikova A.N.[3], Shamova E.V.[1]

[1]*Institute of Biophysics and Cell Engineering of the National Academy of Sciences of Belarus, Minsk, Belarus*

[2]*Vitebsk State Medical University, Vitebsk, Belarus*

[3]*Center for Theoretical Problems of Physico-Chemical Pharmacology, RAS, Moscow, Russia*

INTRODUCTION & AIM

MicroRNAs are a class of small non-coding RNAs that perform important functions in regulating gene expression. Numerous data show that abnormal expression of microRNAs is observed in people with various oncopathologies. Platelet-derived microvesicles (PMV) have been shown to carry microRNAs targeting oncogenes and tumor suppressor genes. MicroRNA-27 plays an important role in oncogenesis, proliferation, tumor cell metabolism, chemotherapy resistance, and also regulates tumor immune response and epithelial-mesenchymal transition.

Aims: In this pilot study, we examined the expression levels of miRNA-27 in PMV of breast cancer (BC), lung cancer (LC), and kidney cancer (KC) patients before and after surgery.

METHOD

Preparation of microvesicles

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Total RNA Extraction

↓

Synthesis of complementary DNA (cDNA)

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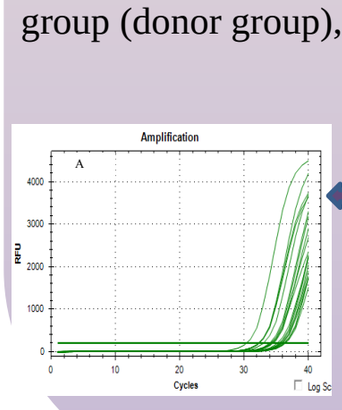
PCR analysis

30 patients:
10 - breast cancer (BC),
10 - lung cancer (LC),
10 - kidney cancer (KC),
and
10 clinically healthy individuals were involved in the study.

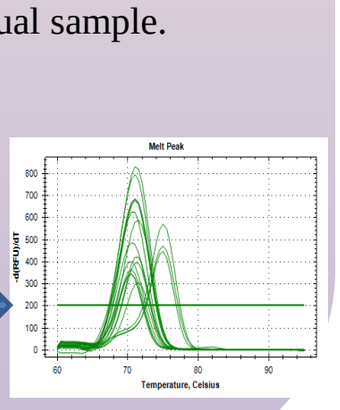
All patients were subject to radical surgical treatment. PMVs were isolated from washed thrombin-stimulated platelets by sequential centrifugation. mRNA was extracted using the phenol-chloroform method. Synthesis of complementary DNA (cDNA) and PCR analysis was performed using the miRCURY LNA miRNA PCR Starter Kit (Qiagen). Study approved by the Ethics Committee of Vitebsk Regional Clinical Oncology Center.

For each sample, the value of the threshold cycle Cq was determined, reflecting the intersection of the accumulation curve of amplification products with the baseline. The relative expression level of each miRNA was determined using the formula $R=2^{\Delta Cq}$, where R – relative expression of microRNA, $\Delta Cq = Cq1 - Cq2$, Cq1 is the average Cq value in the control group (donor group), Cq2 is the Cq value of each individual sample.



Amplification curves obtained during one of the experiments

Melting curves obtained during one of the experiments



RESULTS & DISCUSSION

The results indicated that PMVs of all patients with various oncopathologies exhibited significantly reduced expression of microRNA-27 in comparison to healthy donors. Thus, in BC, the median expression level of microRNA-27 was 6.4 times lower; in LC, it was 2.5 times lower; and in KC, it was 4.6 times lower. Post-surgery, the expression of microRNA-27 in patients with BC and LC did not differ from control values, however in KC, it was drastically reduced by 3.5 times.

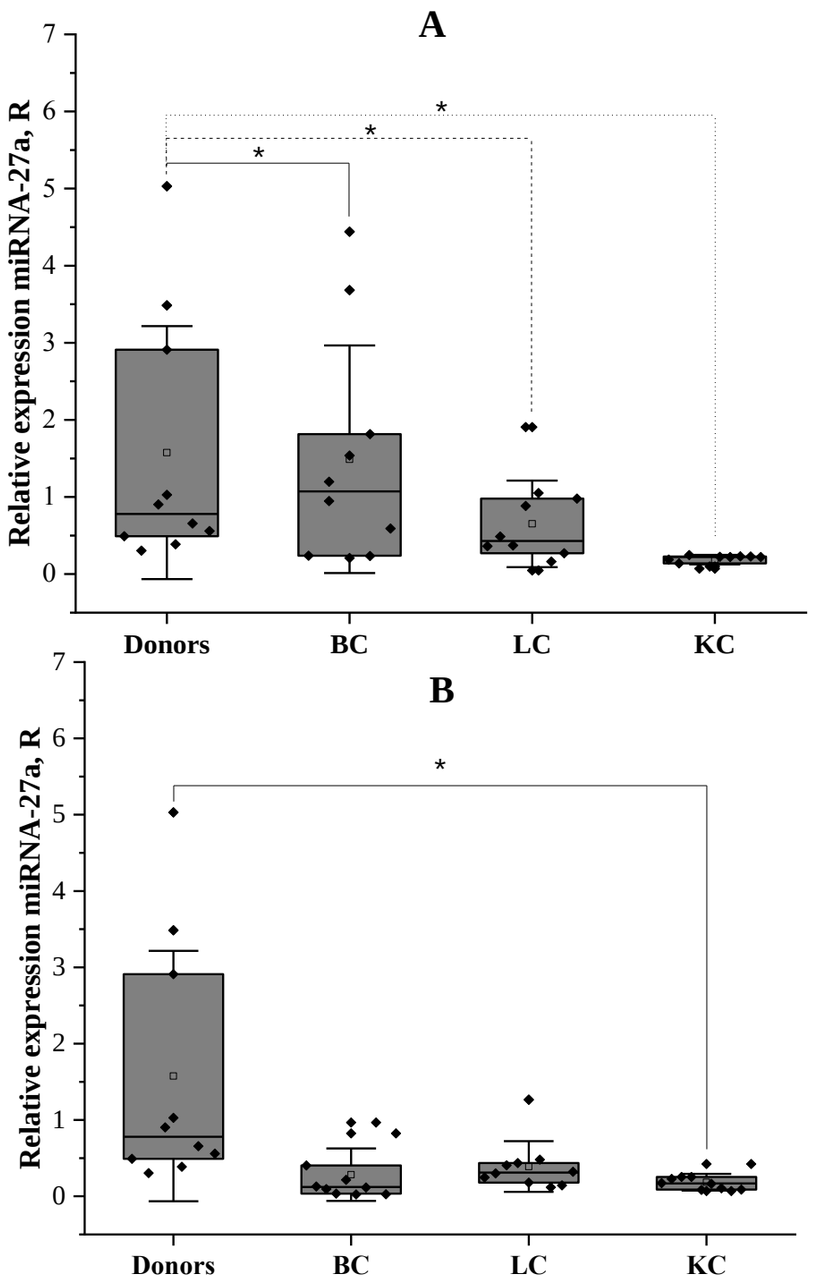


Figure. Relative expression miRNA-27a (R): A – before surgery, B – after surgery

CONCLUSION

Consequently, our data suggest that platelet miRNA-27 may act as potential diagnostic and prognostic biomarkers for BC, LC and KC, however, additional research with a larger sample size is required.

REFERENCES

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