Expression of $A_1$ and $A_3$ adenosine receptors in human breast tumors

Mojtaba Panjehpour$^{1,3}$, Simin Hemati$^2$, and Mohammad Ali Forghani$^1$

$^1$Department of Biochemistry, School of Pharmacy and Pharmaceutical Sciences, $^2$Radiation Oncology Department, and $^3$Bioinformatics Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

ABSTRACT

Background. Adenosine receptors ($A_1$, $A_{2A}$, $A_{2B}$, $A_3$) play an important role in the regulation of growth, proliferation and death of cancer and normal cells. We recently showed the expression profile of $A_{2A}$ and $A_{2B}$ receptors in normal and tumor breast tissues. In the present study, we used semiquantitative RT-PCR to measure the $A_1$ and $A_3$ gene expression levels in normal and tumor breast tissues.

Methods. Breast tumors ($n = 18$) and non-neoplastic mammary tissues ($n = 10$) were collected and histologically confirmed to be neoplastic or non-neoplastic, respectively. Total RNA was extracted and reverse transcribed into cDNA, and PCR was performed under optimized condition for each receptor subtype. Amplification of beta-actin mRNA served as control for RT-PCR. The PCR products were separated on 1.7% agarose gels. The intensity of the bands was quantitated with ImageJ software after normalization against beta-actin expression.

Results. All breast tumor and normal tissue specimens expressed $A_1$ and $A_3$ adenosine receptor transcripts. However, we observed that the expression level of the $A_3$ receptor in tumor tissues was 1.27-fold that of normal tissues, whereas there was no significant difference between the expression levels of $A_1$ in normal and tumor tissues.

Conclusions. Interestingly, the results of the present study indicate that breast tumors exhibit a higher level of $A_3$ transcripts (than normal tissues) and support the possible key role of $A_3$ adenosine receptor in tumor development. However, further studies based on real-time quantitative RT-PCR are needed to identify the exact gene expression levels.

Key words: adenosine receptors $A_1$ and $A_3$, breast cancer, RT-PCR.

Acknowledgments: The study was supported by the Research Council of Isfahan University of Medical Sciences (No. 387309). The expert technical assistance of Mrs Fateme Moazen is gratefully acknowledged.

Conflict of interest: The authors declare that they have no conflict of interest.

Correspondence to: Mojtaba Panjehpour, PhD, Dept. of Biochemistry & Bioinformatics Research Center, School of Pharmacy and Pharmaceutical Sciences, Isfahan University of Medical Sciences, Post Box:81746-73461, Isfahan, Iran.
Tel +98-311-7922592; fax +98-311-6680011; e-mail panjehpour@pharm.mui.ac.ir

Received April 6, 2011; accepted May 20, 2011.