

# Expression of A<sub>1</sub> and A<sub>3</sub> adenosine receptors in human breast tumors

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

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## ABSTRACT

**Background.** Adenosine receptors (A<sub>1</sub>, A<sub>2A</sub>, A<sub>2B</sub>, A<sub>3</sub>) 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<sub>2A</sub> and A<sub>2B</sub> receptors in normal and tumor breast tissues. In the present study, we used semiquantitative RT-PCR to measure the A<sub>1</sub> and A<sub>3</sub> 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<sub>1</sub> and A<sub>3</sub> adenosine receptor transcripts. However, we observed that the expression level of the A<sub>3</sub> receptor in tumor tissues was 1.27-fold that of normal tissues, whereas there was no significant difference between the expression levels of A<sub>1</sub> in normal and tumor tissues.

**Conclusions.** Interestingly, the results of the present study indicate that breast tumors exhibit a higher level of A<sub>3</sub> transcripts (than normal tissues) and support the possible key role of A<sub>3</sub> adenosine receptor in tumor development. However, further studies based on real-time quantitative RT-PCR are needed to identify the exact gene expression levels.

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