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Selective inhibitory effect of adenosine A١ receptor agonists on the proliferation of human tumor cell lines

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View references (١٩)

Abstract

Background: In this study, the effects of three structural analogues of adenosine upon proliferation of human tumor cells were investigated. Previous research showed a cytotoxic effect of adenosine via A٣ receptor and A١ receptor and sometimes this effect was receptor independent. The researches showed a differential cytotoxic effect of adenosine and its A٣ agonists on cancerous cells, while other studies demonstrated tumor promoting effect of adenosine and its A١ agonists. The purpose of the present study was the evaluation of the possible selective anti-tumor effect of A ١ receptor agonists on cancerous cells. Methods: The substances of N٦-cyclohexyl-adenosine (CHA, A١ agonist), R-isomer of N٦-phenylisopropyladenosine (R-PIA, A١ agonist) and N٥-ethylcarboxamido-adenosine (NECA, adenosine A١-A٢ non-specific agonist) were tested for their anti-proliferative effect using ٣-(٤،٥-dimethylthiazol-٢-yl)-٢،٥-diphenyltetrazolium bromide (MTT) assay method. Hep G٢, Hep٢, CACO٢, ACHN and L٩٢٩ cell lines were used in this assay. Results: CHA inhibited cell proliferation in three cell lines (in concentration of ٥-٥٠ μM) and R-isomer of R-PIA in one cell line (in concentration of ١٠-٥٠ μM). These effects were inhibited partially by addition of ١،٣-Dipropyl-٨- cyclopentylxanthine (A١ antagonist). The NECA analogue had no inhibitory effect on the cell proliferations. All of the substances had no cytotoxic effect on L٩٢٩ cells (mouse connective tissue fibroblast cell line). Conclusion: CHA and R-PIA had inhibitory effect on the proliferation of human tumor cell lines partially via A١ receptor, while they didn't show such effect on fibroblast cells. These results suggest that A١ adenosine receptor agonists have a good potential of specific anti-tumor activity.

Reaxys Database Information

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Author keywords

A١ receptor; Adenosine; Anti-tumor effect; Cytotoxicity; N ٦-cyclohexyl-adenosine (CHA); N٦-phenylisopropyladenosine (R-PIA)

Indexed Keywords

EMTREE drug terms: ٣ (٤،٥ dimethyl ٢ thiazolyl) ٢،٥ diphenyltetrazolium bromide; ٨ cyclopentyl ١،٣ dipropylxanthine; adenosine ٥' (n ethylcarboxamide); adenosine A١ receptor agonist; cyclohexyladenosine; dimethyl sulfoxide; phenylisopropyladenosine

EMTREE medical terms: animal cell; antineoplastic activity; article; cell proliferation; cell viability; controlled study; drug cytotoxicity; drug mechanism; drug selectivity; fibroblast culture; human; human cell; mouse; nonhuman; tumor cell line

MeSH: Adenosine-٥'-(N-ethylcarboxamide); Cell Line, Tumor; Cell Proliferation; Humans; Methotrexate; Receptor, Adenosine A١

Medline is the source for the MeSH terms of this document.

Chemicals and CAS Registry Numbers: ٣ (٤،٥ dimethyl ٢ thiazolyl) ٢،٥ diphenyltetrazolium bromide, ٢٩٨-٩٣-١; ٨ cyclopentyl ١،٣ dipropylxanthine, ١٠٢١٤٦-٠٧-٦; adenosine ٥' (n ethylcarboxamide), ٣٥٩٢٠-٣٩-٩; cyclohexyladenosine, ٣٦٣٩٦-٩٩-٣; dimethyl sulfoxide, ٦٧-٦٨-٥; phenylisopropyladenosine, ٢٠١٢٥-٤٠-٠;Adenosine-٥'-(N-ethylcarboxamide), ٣٥٩٢٠-٣٩-٩; Methotrexate, ٥٩-٠٥-٢; Receptor, Adenosine A١

Manufacturers:Drug manufacturer: Sigma Aldrich, Germany.