

**Drug and Chemical Toxicology** >

Latest Articles

0

Views

0

CrossRef citations to date

0

Altmetric

Research Article

Genotoxic and mutagenic potential of 7-methylxanthine: an investigational drug molecule for the treatment of myopia

Harjeet Singh, Harmanpreet Singh, Sunil Sharma, Harmanpreet Kaur, Arvinder Kaur, Satwinderjeet Kaur , ...show all

Received 04 Jul 2022, Accepted 26 Dec 2022, Published online: 03 Jan 2023

 Download citation <https://doi.org/10.1080/01480545.2022.2164011> Check for updates

Sample our
Bioscience
Journals
>> [Sign in here](#) to start your access
to the latest two volumes for 14 days

Abstract

7-Methylxanthine (7-MX, CAS No. 552-62-5, purity 99.46%) is the first orally administered drug candidate, which showed anti-myopic activity in different pre-clinical studies. In the present study, we investigated the *in-vivo* genotoxic and mutagenic toxicity of 7-MX in Wistar rats using comet/single-cell gel electrophoresis, chromosomal aberration and micronucleus assays after oral administration. For the single-dose study (72 h), two doses of 7-MX 300 and 2000 mg/kg body weight were selected. For a repeated dose 28 d study, three doses (250, 500, and 1000 mg/kg) of 7-MX were selected. The doses were administered via oral gavage in the suspension form. Blood and major vital organs such as bone marrow, lung and liver were used

to perform comet/single cell gel electrophoresis, chromosomal aberration, and micronucleus assays. The *in-vitro* Ames test was performed on TA98 and TA100 strains. In the chromosomal aberration study, a non-significant increase in deformities such as stickiness, ring chromosome, and endoreduplication was observed in bone marrow cells of 7-MX treated groups. These chromosomal alterations were observed upon treatment with doses of 2000 mg/kg single dose for 72 h and 1000 mg/kg repeated dose for 28 d. At a dose of 500 mg/kg, DNA damage in terms of tail length, tail moment, % tail DNA and the olive tail moment was also found to be non-significant in 7-MX treated groups. The Ames test showed the non-mutagenic nature of 7-MX in both strains of TA98 and TA100 of *Salmonella typhimurium* with or without metabolic activation. Thus, the present work is interesting in view of the non- genotoxicity and non-mutagenicity of repeated doses of 7-MX.

Q Keywords: 7-Methyl xanthine (7-MX CAS No. 552-62-5 purity 99%) Wistar rats comet assay genotoxicity Ames test chromosomal aberration myopia

[< Previous article](#)

[View latest articles](#)

[Next article >](#)

Log in via your institution

[> !\[\]\(3211b5d1d968fc1665909b34f9f16010_img.jpg\) Access through your institution](#)

Log in to Taylor & Francis Online

[> Log in](#)

Restore content access

[> Restore content access for purchases made as guest](#)

Purchase options *

[Save for later](#)

PDF download + Online access

- 48 hours access to article PDF & online version
- Article PDF can be downloaded
- Article PDF can be printed

USD 62.00 Add to cart**Issue Purchase**

- 30 days online access to complete issue
- Article PDFs can be downloaded
- Article PDFs can be printed

USD 1,176.00 Add to cart**Purchase access via tokens**

- Choose from packages of 10, 20, and 30 tokens
- Can use on articles across multiple libraries & subject collections
- Article PDFs can be downloaded & printed

From USD 450.00
per package[Learn more](#)

* Local tax will be added as applicable

Acknowledgements

The authors are grateful to the Department of Science & Technology, New Delhi for financial assistance to the Department of Pharmaceutical Sciences, under the DST-FIST scheme (sanction no. SR/FST/LSI-657/2016). Authors are also grateful to University Grant Commission (UGC), New Delhi to provide grants in aid to Guru Nanak Dev University, Amritsar under component 4.0 of RUSA 2.0 scheme to establish Center for Basic and Translational Research in Health Sciences (CBTRHS). The authors are also grateful to the All India Council for Technical Education (AICTE) for providing financial support [Sanction no. 9-47/1DC/MODROB/Policy-1/2019-20]. The authors are also thankful to V.B. Medicare Pvt. Ltd. Hosur, Bangalore for providing 7-MX.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Additional information

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.



Related Research

Recommended articles

Cited by

Recommendations aren't yet available

Information for

[Authors](#)[R&D professionals](#)[Editors](#)[Librarians](#)[Societies](#)

Opportunities

[Reprints and e-prints](#)[Advertising solutions](#)[Accelerated publication](#)[Corporate access solutions](#)

Open access

[Overview](#)[Open journals](#)[Open Select](#)[Dove Medical Press](#)[F1000Research](#)

Help and information

[Help and contact](#)[Newsroom](#)[All journals](#)[Books](#)

Keep up to date

Register to receive personalised research and resources
by email

[Sign me up](#)

Copyright © 2023 Informa UK Limited [Privacy policy](#) [Cookies](#) [Terms & conditions](#) [Accessibility](#)

Registered in England & Wales No. 3099067
5 Howick Place | London | SW1P 1WG

 Taylor & Francis Group
Taylor & Francis Group