



INTERNATIONAL JOURNAL OF
Radiation Oncology
BIOLOGY • PHYSICS

Official Journal of the American Society for Therapeutic Radiology and Oncology **ASTRO**

Register or Login: Password: **SIGN IN** Auto-Login [\[Reminder\]](#)

Search This Periodical for **GO**

[Advanced Search](#) - [MEDLINE](#) - [My Recent Searches](#) - [My Saved Searches](#) - [Search Tips](#)

- JOURNAL HOME
- CURRENT ISSUE
- BROWSE ALL ISSUES
- ASTRO ABSTRACTS
- ARTICLES IN PRESS
- ISSUE HIGHLIGHTS
- SEARCH THIS JOURNAL
- THE GREEN JOURNAL
- JOURNAL INFORMATION
 - Aims and Scope
 - Editorial Board
 - Submit Manuscript
 - Submit Review
 - Author Information
 - COI Disclosure
 - Abstracting/Indexing
 - Contact Information
 - Pricing Information
- SUBSCRIBE TO JOURNAL
- ADVERTISING INFORMATION
- RTSOURCE
- ASTRO
- MY PDA

Volume 69, Issue 4, Pages 1246-1253
(15 November 2007)

◀ previous 40 of 61 next ▶

Differential Radiosensitizing Potential of Temozolomide in MGMT Promoter Methylated Glioblastoma Multiforme Cell Lines

Krista A. van Niftrik, M.Sc.*†, Jaap van den Berg, B.S.*, Lukas J.A. Stalpers, M.D., Ph.D.‡, M. Vincent M. Lafleur, Ph.D.*, Sieger Leenstra, M.D., Ph.D.§, Ben J. Slotman, M.D., Ph.D.*, Theo J.M. Hulshof, Ph.D.‡, Peter Sminia, Ph.D.*✉

Received 25 April 2007; received in revised form 28 June 2007; accepted 30 July 2007

Purpose

To investigate the radiosensitizing potential of temozolomide (TMZ) for human glioblastoma multiforme (GBM) cell lines using single-dose and fractionated γ -irradiation.

Methods and Materials

Three genetically characterized human GBM cell lines (AMC-3046, VU-109, and VU-122) were exposed to various single (0–6 Gy) and daily fractionated doses (2 Gy per fraction) of γ -irradiation. Repeated TMZ doses were given before and concurrent with irradiation treatment. Immediately plated clonogenic cell-survival curves were determined for both the single-dose and the fractionated irradiation experiments. To establish the net effect of clonogenic cell survival and cell proliferation, growth curves were determined, expressed as the number of surviving cells.

Results

All three cell lines showed MGMT promoter methylation, lacked MGMT protein expression, and were sensitive to TMZ. The isotoxic TMZ concentrations used were in a clinically feasible range of 10 $\mu\text{mol/L}$ (AMC-3046), 3 $\mu\text{mol/L}$ (VU-109), and 2.5 $\mu\text{mol/L}$ (VU-122). Temozolomide was able to radiosensitize two cell lines (AMC 3046 and VU-122) using single-dose irradiation. A reduction in the number of surviving cells after treatment with the combination of TMZ and fractionated irradiation was seen in all three cell lines, but only AMC 3046 showed a radiosensitizing effect.

Conclusions

This study on TMZ-sensitive GBM cell lines shows that TMZ can act as a radiosensitizer and is at least additive to γ -irradiation. Enhancement of the radiation response by TMZ seems to be independent of the epigenetically silenced MGMT gene.

[Human GBM cell lines](#), [Temozolomide](#), [MGMT](#), [Radiosensitization](#), [Fractionated irradiation](#)

* Department of Radiation Oncology, VU University Medical Center, Amsterdam, The Netherlands

† Department of Neurogenetics, Academic Medical Center, Amsterdam, The Netherlands

‡ Department of Radiotherapy, Academic Medical Center, Amsterdam, The Netherlands

§ Department of Neurosurgery, Academic Medical Center, Amsterdam, The Netherlands

✉ Reprint requests to: Peter Sminia, Ph.D., Division of Radiobiology, Department of Radiation Oncology, VU University Medical Center, Bldg: Faculty of Medicine, Room J-392, Van der Boechorststraat 7, 1081 BT Amsterdam, The Netherlands. Tel: (+31) 20-4448355; Fax: (+31) 20-4448285

Supported by Dutch Cancer Society Grant No. VU 2000-2149.

Conflict of interest: none.

- ▶ ABSTRACT
- FULL TEXT
- FULL-TEXT PDF (321 KB)
- CITATION ALERT
- CITED BY
- RELATED ARTICLES
- EXPORT CITATION
- EMAIL TO A COLLEAGUE



More periodicals:

- FIND A PERIODICAL
- FIND A PORTAL
- GO TO PRODUCT CATALOG

PII: S0360-3016(07)03859-X

doi:10.1016/j.ijrobp.2007.07.2366

© 2007 Elsevier Inc. All rights reserved.

Copyright © 2007 Elsevier, Inc. All rights reserved | [Privacy Policy](#) | [Terms & Conditions](#) | [Feedback](#) | [About Us](#) | [Help](#) | [Contact Us](#) |
The content on this site is intended for health professionals.