doi:10.1093/brain/aww325



## LETTER TO THE EDITOR

## Reply: Corticosteroids compromise survival in glioblastoma in part through their elevation of blood glucose levels

Michael Weller, 1,\* Eric C. Holland 2,3,\* and Dolores Hambardzumyan 4,\*

## \*These authors contributed equally to this work.

- 1 Department of Neurology, University Hospital and University of Zurich, CH-8091 Zurich, Switzerland
- 2 Alvord Brain Tumor Center and Department of Neurosurgery, University of Washington, Seattle, WA 98109, USA
- 3 Solid Tumor and Translational Research, University of Washington, Seattle, WA 98109, USA
- 4 Department of Pediatrics, Aflac Cancer and Blood Disorders Center, Children's Healthcare of Atlanta, Emory University School of Medicine, Atlanta, GA, USA

Correspondence to: Dolores Hambardzumyan 1760 Haygood Drive, E-380, Atlanta, 30329, GA, USA E-mail: dhambar@emory.edu

Correspondence may also be addressed to: Eric Holland 1100 Fairview Avenue N., Seattle, WA 98109, USA E-mail: eholland@fhcrc.org

Michael Weller

Frauenklinikstrasse 26, CH-8091, Zürich, Switzerland E-mail: michael.weller@usz

## Sir,

We appreciate the interest of Drs Clement and Champ in our article, which provided overall compelling evidence for a negative impact of corticosteroid medication on survival in patients with glioblastoma. Our colleagues raise the interesting hypothesis that part of this adverse effect of corticosteroids is through its elevation of blood glucose levels. They reason that elevated glucose in turn may induce resistance to radiotherapy and may overall facilitate survival of glioblastoma cells under untoward

microenvironmental conditions. While we do not necessarily concur with the view that hyperglycaemia is the most prominent side-effect of steroids in the context of glioblastoma, the hypothesis is nevertheless interesting and could be tested with appropriate experimental models. The evidence in the literature summarized by our colleagues further lends support to our recommendation that steroid use in glioblastoma patients should be limited to the dose and duration considered absolutely necessary.