Reviewer’s report

Title: NG2 and phosphacan are present in the astroglial scar after human traumatic spinal cord injury

Version: 1 Date: 29 January 2009

Reviewer: L Gerard Toussaint III

Reviewer’s report:

REVIEW OF:
NG2 and phosphacan are present in the astroglial scar after human traumatic spinal cord injury
Authors:
Armin Buss, Katrin Pech, Byron Kakulas, Didier Martin, Jean Schoenen, Johannes Noth and Gary Brook

I have read with interest the descriptive research contained in this publication. The authors present a cogent argument as to why such a study is valuable. I have recommended publication with minor revisions.

The question addressed, the true spatial and temporal expression of 4 members of the proteoglycan family after spinal cord injury, is posed clearly. The methods used are standard for immunohistochemistry and are described well enough to repeat in another laboratory. The data presentation conforms to norms in the field. The discussion and conclusions are well-delivered and are supported by the data, with the revisions noted below. The limitations of the work are noted, and there is an adequate reference to existing data. The title and abstract are appropriate and the writing is adequate.

The revisions I suggest (and I trust they can be addressed easily), are:

1. How far rostral and caudal to the lesion were samples collected?
2. Why did the authors choose to study 4 proteoglycan molecules and not 5, 7, or 3? Brevican, perlecan, and others may be important. Some reference to the importance of these four over others seems reasonable to expect.
3. The authors present results in two groups of patients – early and late post-injury death. However, in the ‘late’ group, the narrative divides these into 24 days-4 months, and >4months. Adding a third group (early, mid-range, and late) would not devalue the data and may make them easier to understand.
4. The authors may benefit from mentioning that macrophages staining positive for certain proteoglycan species may have positivity from phagocytosis as well as native production of these molecules. I did not see micrographs with enough resolution to determine which was more likely.
5. The determination of the half life of proteoglycans after death is central to the
data. The authors address this shortcoming. An animal experiment could be proposed, at least, showing the temporal loss of NG2, neuracan, versican, and phosphacan with fixation 1 hour, 2 hours, 4 hours, 6 hours, 12 hours, 24 hours, or 48 hours after death. Are these data already in existence?

6. Conclusions about the role of each PG should be tempered. We have here multiple snapshots in time and space, but do not know about potential transient expression of various PGs at the exact time when axons are trying to regenerate. NG2 and phosphocan in the astroglial scar may be secreted to foster regeneration, but their function inhibited by an undetermined molecule. The location of their expression makes them potential candidates for further investigation on inhibitors of neuro-regeneration. Neurocan and versican in the lesion core are described as “unlikely to participate in failed regeneration.” We don’t know if these are secreted to foster regeneration and that effect is negated by some other mechanism. Their location makes them less likely candidates for further investigation. That’s the utility of this paper – to parse out what is more or less likely to be important based on location and timing of expression.

Thank you for allowing me to share my thoughts.

L. Gerard Toussaint
Texas A&M HSC College of Medicine

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

No competing interests.