

## Supplementary Information

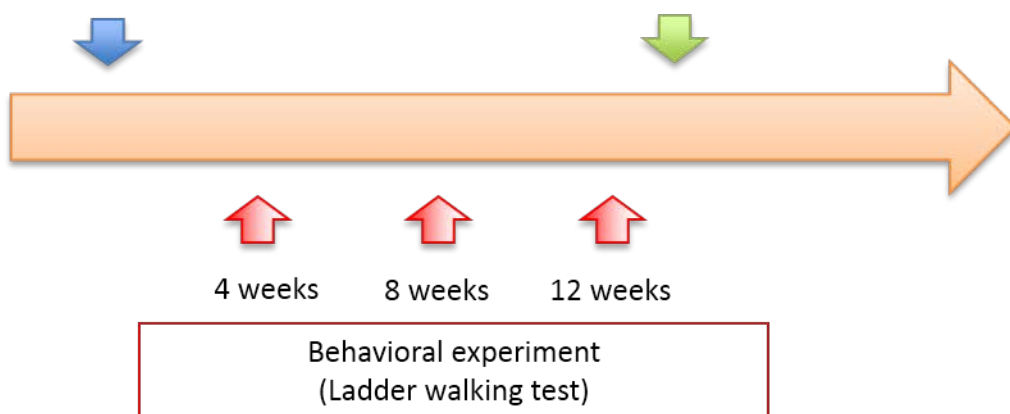
**Figure S1.** (A) Protocol of this study; (B) Ladder rung walking test apparatus. Total length of 82 cm, evaluate length of 60 cm; (C) The regular pattern rung distance is 2 cm. Definition of the footslip; (D) Normal stepping; (E) The right forelimb fall under the rung (arrow); and (F) The right wrist joint position is under the rung (arrow).

**A**

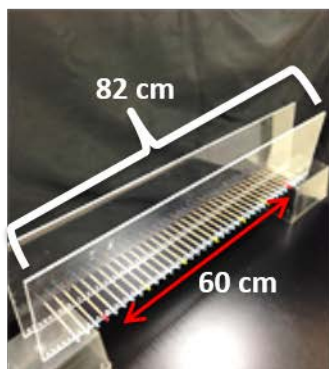
**Left-side unilateral decortication**

- NBH (Postnatal day 7)
- ABH (Postnatal 8-12 weeks)

Retrograde tracing  
•Fluorogold



**B**



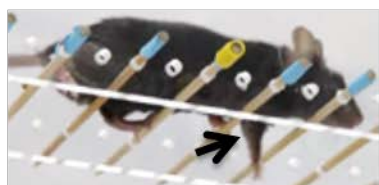
**C**



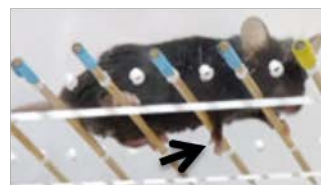
**D**



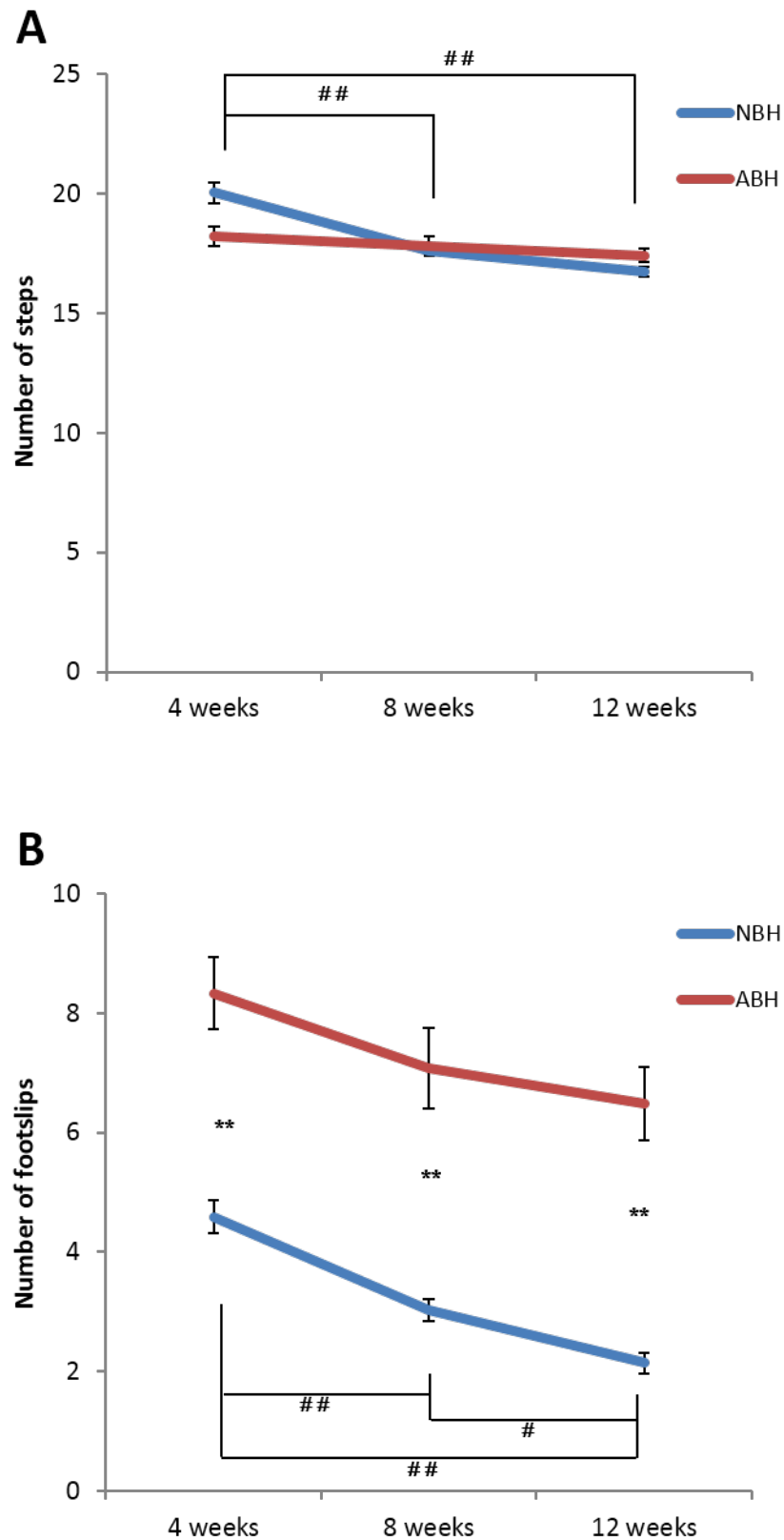
**E**



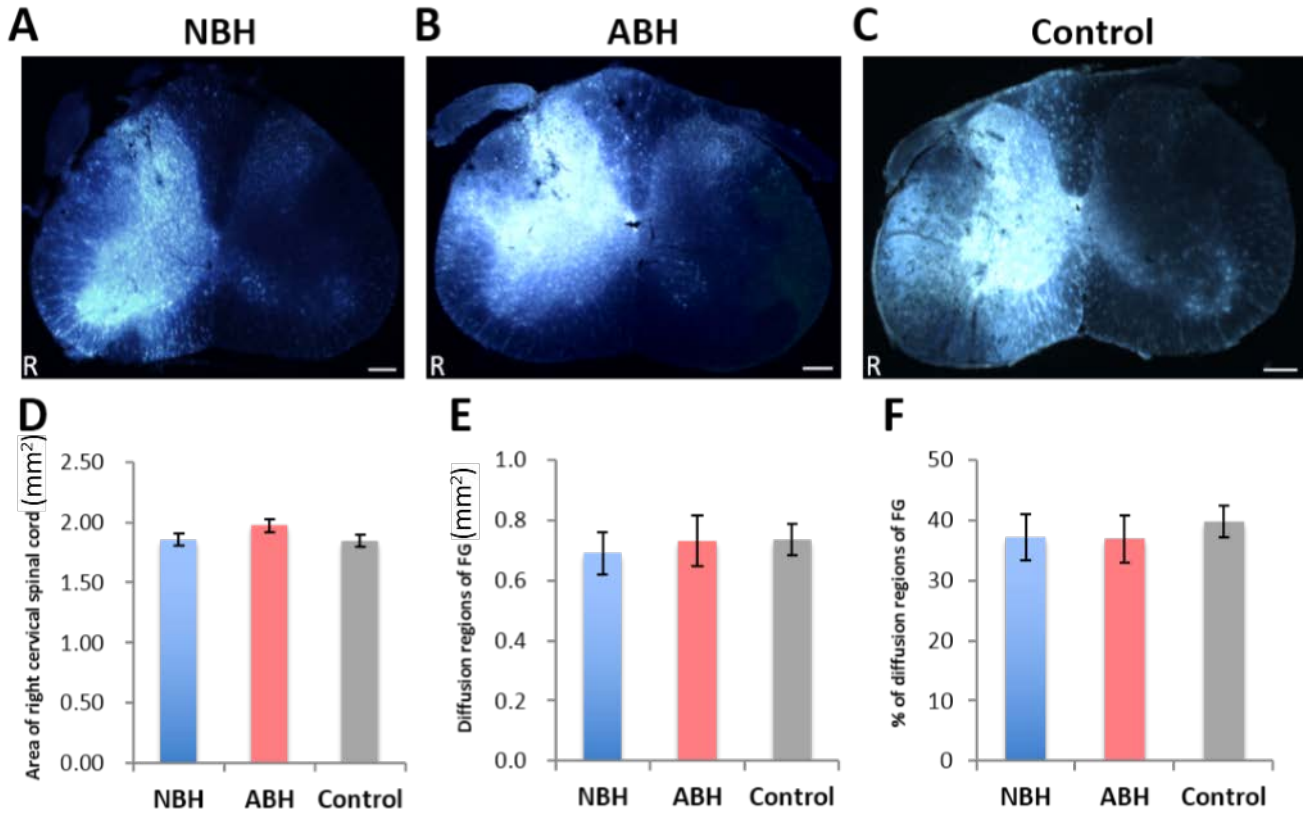
**F**



**Figure S2.** The result of the horizontal ladder rung walking test. The number of total steps (**A**). The number of foot slips (**B**). NBH group ( $n = 20$ ). ABH group ( $n = 12$ ). Control group ( $n = 9$ ). (\*\*  $p < 0.01$ , Mann-Whitney U test,  $^{###} p < 0.01$   $^{\#} p < 0.05$ , Kruskal-Wallis with the Tukey post hoc test).



**Figure S3** Transverse section of the FG injection site within the cervical spinal cord (**A**: NBH, **B**: ABH, **C**: Control). The area of right cervical spinal cord (**D**). The diffusion region of FG within the right spinal cord (**E**). The percent of diffusion region of FG within the right spinal cord (**F**). There are no significant difference these three components in three groups. R = Right side. Scale bar = 200  $\mu$ m (**A–C**).



**Figure S4.** Pathway and disease states focused gene classification of genes in NBH. Genes (up-regulated: **A**; down-regulated: **B**) were classified based on the available categories of more than 100 biological pathways or specific disease states in the SABiosciences PCR array list (QIAGEN; [www.sabiosciences.com](http://www.sabiosciences.com)) for *Mus musculus*. The numbers in the y-axis represent number of genes in each category which are indicated on the x-axis.

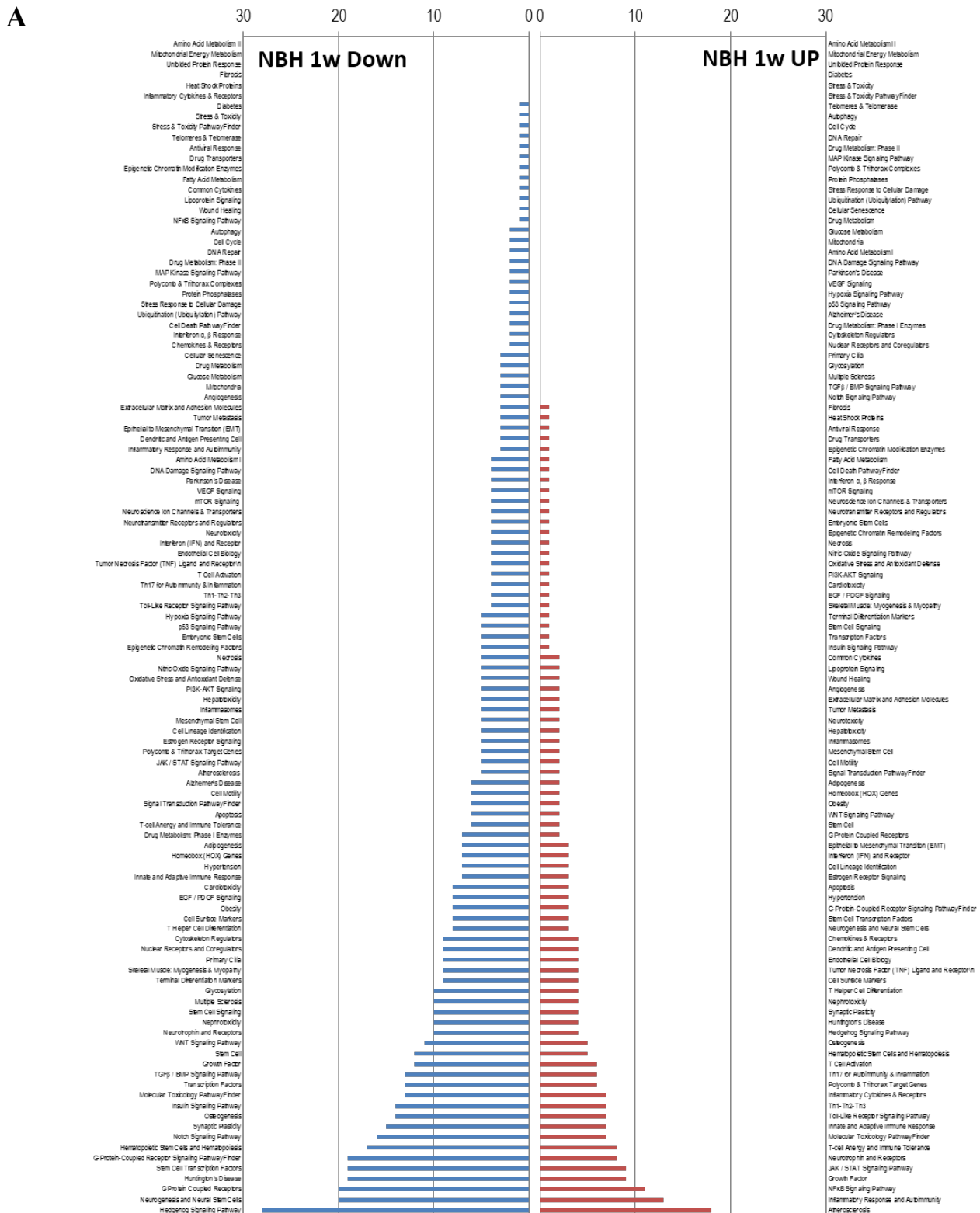
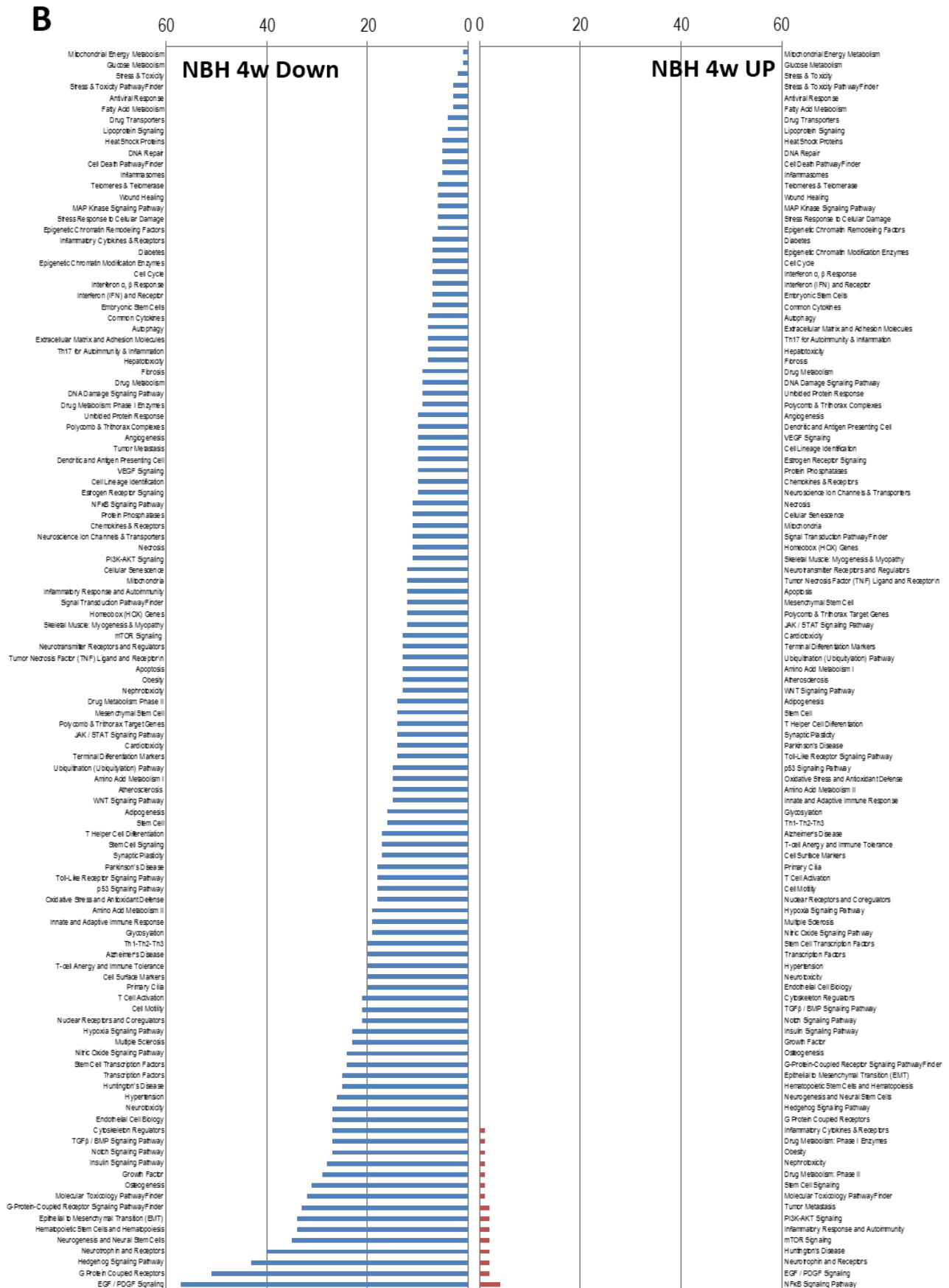


Figure S4. *Cont.*

**Figure 5.** Pathway and disease states focused gene classification of genes in ABH. Genes (up-regulated: **A**; down-regulated: **B**) were classified based on the available categories of more than 100 biological pathways or specific disease states in the SABiosciences PCR array list (QIAGEN; [www.sabiosciences.com](http://www.sabiosciences.com)) for *Mus musculus*. The numbers in the y-axis represent number of genes in each category which are indicated on the x-axis.

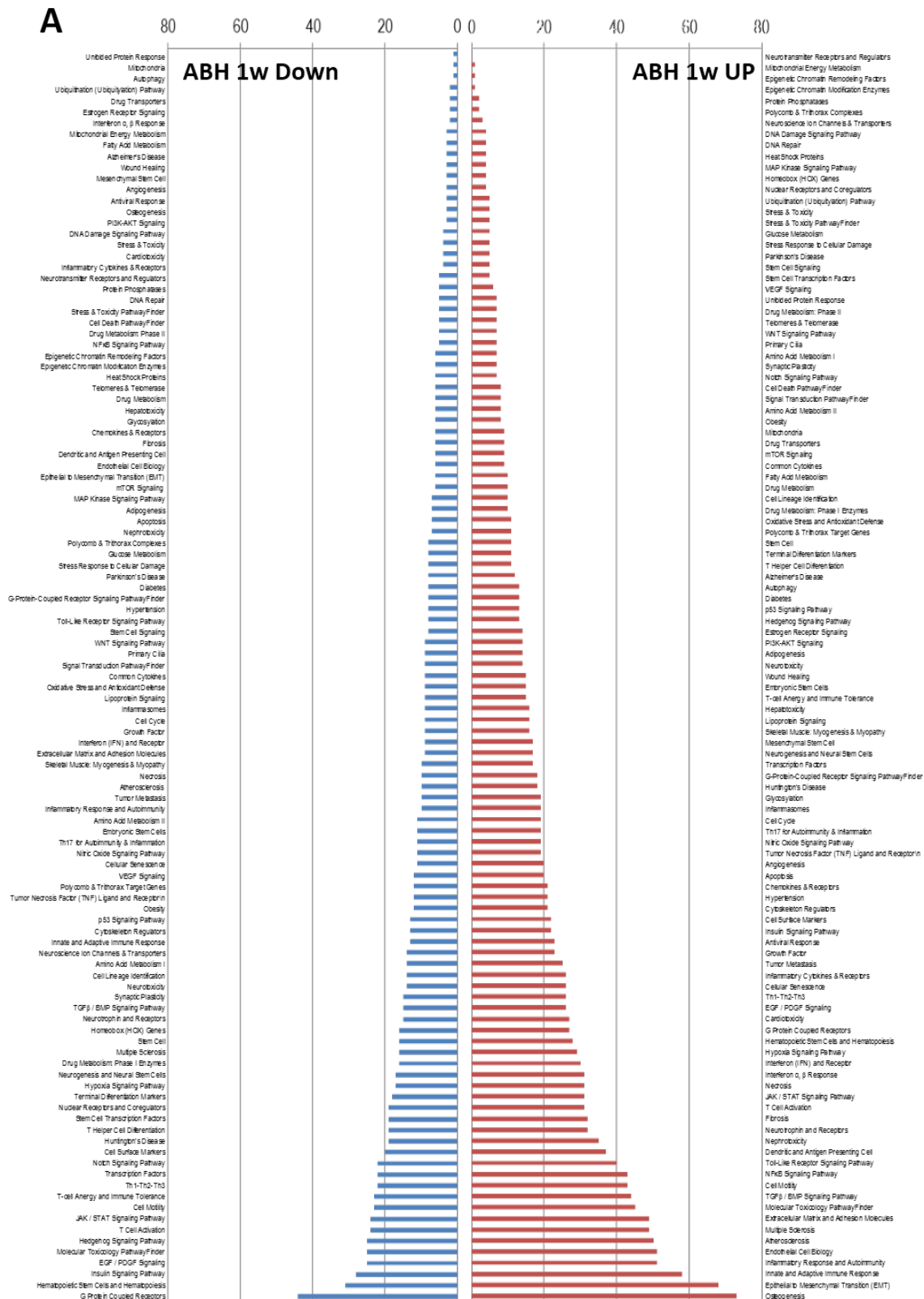


Figure S5. Cont.

