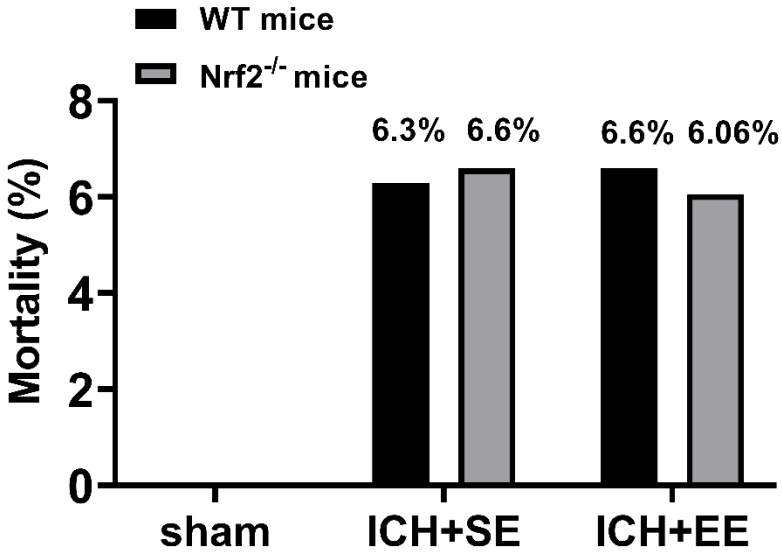
Supplementary material

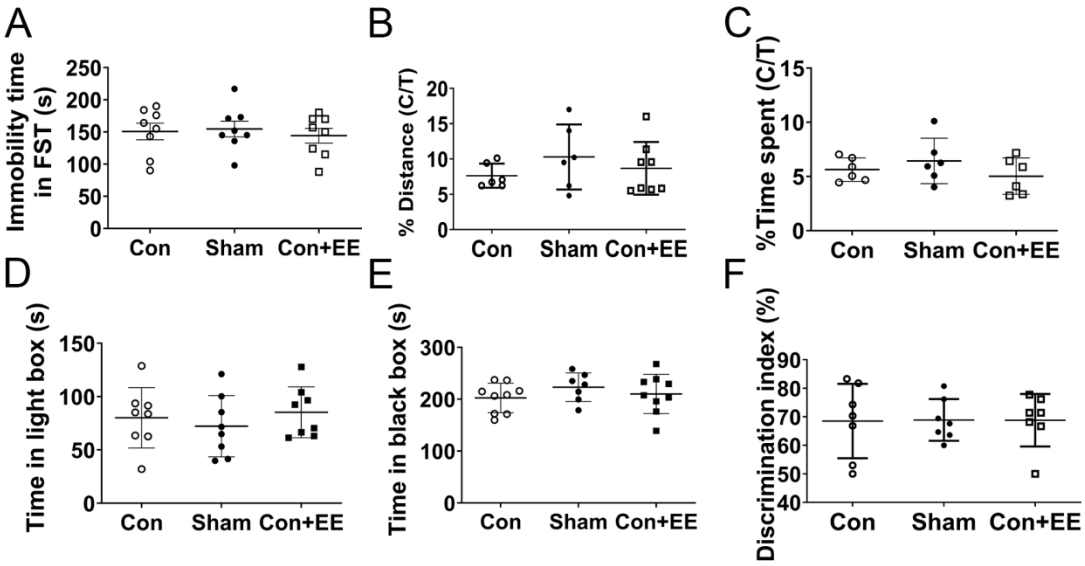
Supplementary Fig. 1

Supplementary Fig. 1 and Supplementary Videos 1-3. Housing conditions in an enriched environment (EE). The EE contained two modified cages, running wheels, igloos with saucer wheels, plastic tubes, and other toys. Six to eight mice were exposed to EE for 6 h/day every day from 8:00 am to 2:00 pm. The toys were replaced and rearranged into a new configuration every day to stimulate the exploratory behavior of the mouse. Video 1 shows mouse activity in an EE setting on day 7 after intracerebral hemorrhage (ICH). Some mice exercise on running wheels or igloos with saucer wheels, and others move back and forth through a maze of plastic tubing-videos 2 and 3 show how the forelimb and hindlimb tests were performed.



Supplementary Fig. 2

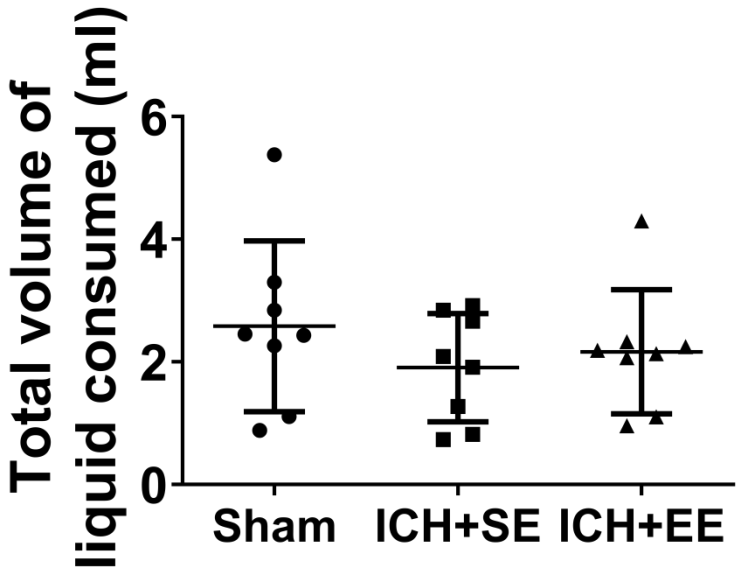
Supplementary Fig. 2. The overall mortality of WT and Nrf2$^{-/-}$ mice in the sham group and the intracerebral hemorrhage (ICH) group exposed to the standard environment (SE) or an enriched environment (EE). No WT (n=73) or Nrf2$^{-/-}$ mice (n=27) died in the sham group. The overall mortality was 6.3% (5 out of 79) in the ICH+SE group and 6.6% (5 out of 76) in the ICH+EE group. The mortality of Nrf2$^{-/-}$ ICH+EE mice (6.06%, 2 out of 33) did not differ from that of Nrf2$^{-/-}$ ICH+SE mice (6.6%, 2 out of 30).



Supplementary Fig. 3

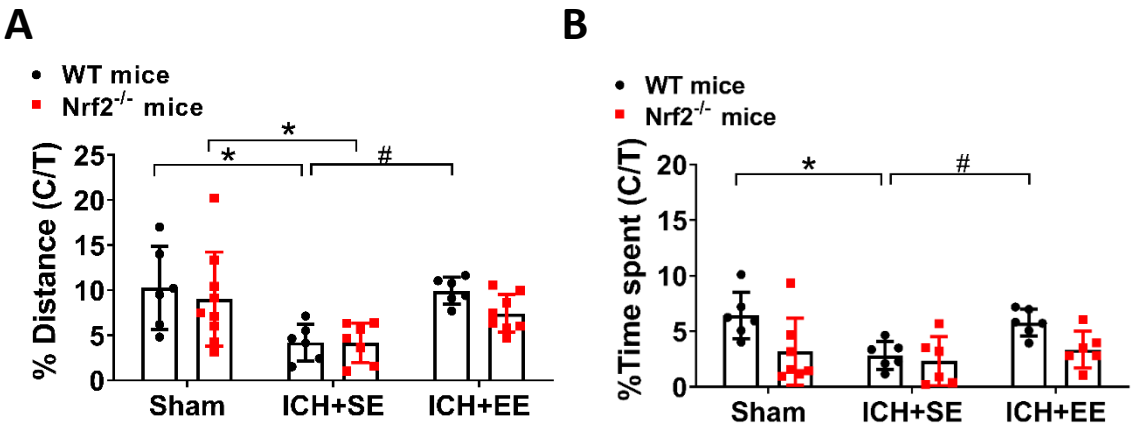
Supplementary Fig. 3. There is no difference in the forced swim test (FST), the light/dark transition test, the open-field test (OFT), and the novel object recognition (NOR) test on day 28 among the control, sham, and control + EE group. (A) FST test. (B) Distance in the center area of the open field. (C) Time in the center area of the open field. (D) The time of the lightbox in the light/dark transition test. (E) The time of the black box in the light/dark transition test. (G) The discrimination index in the NOR test. n=6-9 mice/group; Data are expressed as mean ± SD.

Abbreviation： con: control. C/T: center area/total area

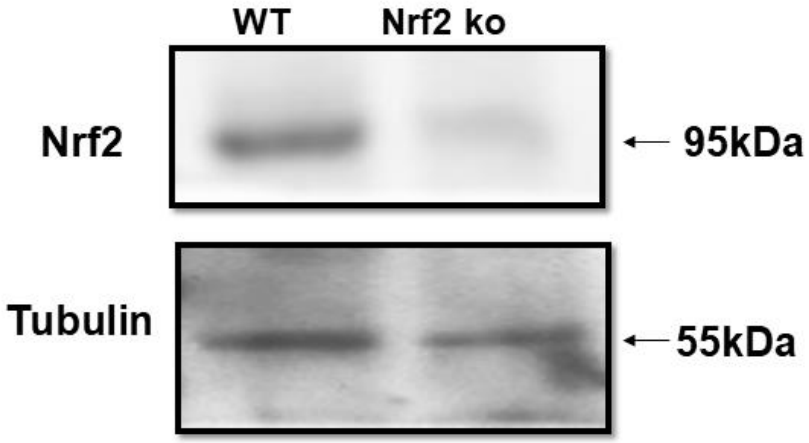


Supplementary Fig. 4

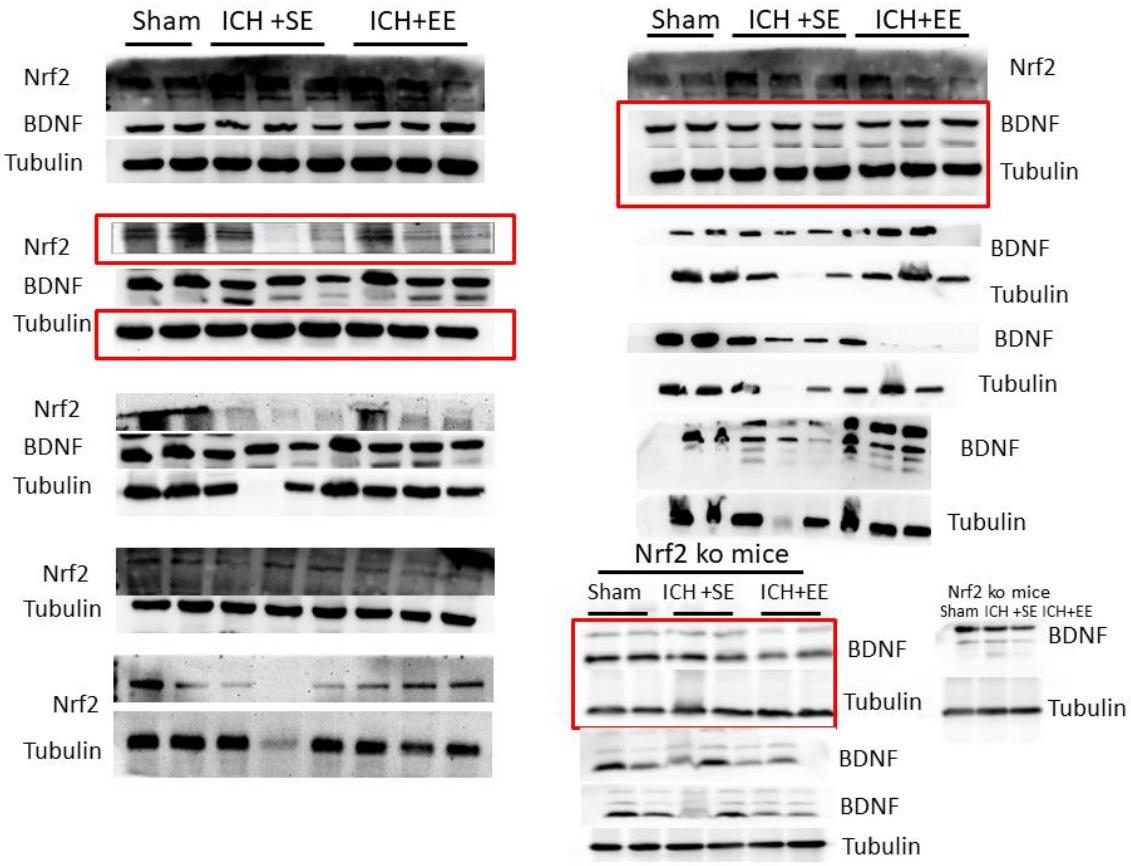
Supplementary Fig. 4. The volume of liquid consumed in the sucrose preference test. The total liquid consumed, including sucrose and water, did not differ among the sham group, the intracerebral hemorrhage (ICH) group exposed to the standard environment (SE), and the ICH group exposed to an enriched environment (EE). n=8 mice/group. Data are expressed as mean ± SD.



Supplementary Fig. 5. (A) In the open field test, exposure of Nrf2$^{-/-}$ mice to the enriched environment (EE) does not increase the percentage of distance in the center area compared to exposure to the standard environment (SE). n=8-10 mice/group, F=0.4416, p<0.05 between ICH+SE and ICH+EE group in Nrf2$^{-/-}$ mice; *p<0.05 vs. sham group; $^{\#}p$<0.05 vs. ICH+SE group; one-way ANOVA followed by Bonferroni's *post hoc* test. (B) There are no differences in time spent in the center area between the ICH groups (SE and EE) and the sham group in Nrf2$^{-/-}$ mice on day 28. n=8-10 mice/group, F=0.2587, p<0.05; *p<0.05 vs. sham group; $^{\#}p$<0.05 vs. ICH+SE group; one-way ANOVA followed by Bonferroni's *post hoc* test. Data are expressed as mean ± SD. C/T: center area/total area



Supplementary Fig. 6. Western blot analysis of Nrf2 expression in perihematomal tissue of the $Nrf2^{-/-}$ mice on day 28 after intracerebral hemorrhage. Nrf2 expression was absent in $Nrf2^{-/-}$ mice.



Supplementary Fig. 7. Raw imaging of Western blots shown in Figs. 6A-B,7F. Western blot analysis of Nrf2 and BDNF expression in the perihematomal tissue on day 28 after intracerebral hemorrhage (ICH). Exposure to EE significantly increased Nrf2 and BDNF expression. n=6 mice/group. Western blot analysis of Nrf2 expression in $Nrf2^{-/-}$ mice and BDNF expression in the perihematomal tissue on day 28 after ICH. BDNF expression did not differ between exposure to the standard environment (SE) and exposure to an enriched environment (EE). n=3 mice/group.