**Supplementary Figures**

**Supplementary Fig. 1**

**a)** The open-field apparatus. The open field was divided into 25 blocks and behaviour was observed and measured using software. Rats were placed in block 1 at the beginning of the test. Light blue shading indicates the centre region. **b)** Comparison of the time each strain stayed in a block during the first open-field test (OFT) trial using statistical heat mapping overlaid on a schematic of the apparatus. Red shading indicates that Wistar rats spent less time in a block than Wistar-Kyoto (WKY) rats (light red: *p* < 0.05; repeated measures general linear model (GLM) with Bonferroni correction and total intracranial volume (TIV) as a covariate). Blue shading indicates that Wistar rats spent more time in a block than WKY rats, and tint indicates statistical significance (light: *p* < 0.05; dark: *p* < 0.001). WKY, *n* = 13; Wistar, *n* = 13.

We found that the WKY rats spent significantly more time in block 1 in the first trial, whereas Wistar rats spent significantly more time in blocks 3–5, 8, 9, 13, 18, and 20–25 in the first trial (*p* < 0.05; repeated-measures GLM with Bonferroni correction and TIV covariate). **c)** Comparison of the time each strain stayed in a block during the second OFT trial using statistical heat mapping overlaid on a schematic of the apparatus. Red shading indicates that Wistar rats stayed in a block for less time than WKY rats (light red: *p* < 0.05; repeated-measures GLM with Bonferroni correction and TIV covariate). Blue indicates Wistar rats stayed in a block for more time than WKY rats; tint indicates statistical significance (light: *p* < 0.05, dark*:* *p* < 0.001). WKY, *n* = 13; Wistar, *n* = 13. WKY rats spent significantly more time in block 1 in the second trial. Wistar rats spent significantly more time in blocks 3–5, 13–15, and 19–25 in thesecond trial (*p* < 0.05; repeated-measures GLM with Bonferroni correction and TIV covariate).

**Supplementary Fig. 2**

Dimensions of the cradle for magnetic resonance imaging, as described by Rehabitech (Kyoto, Japan). An acrylic tube (106.5 mm × 86.5Φ) was divided into four segments. During image acquisition, skulls including the brain were set in the segments and fixed with parafilm. Fluorinert (3M Japan, Tokyo, Japan), a proton-free medium, was injected using an injection bulb to fill all segments. Air was removed using a separate bulb.

**Supplementary Fig. 3**

A *t*-score distribution map of axial brain slices. Blue indicates atrophy and red indicates hypertrophy. In this *t*-score map, the frontal region, including the anterior cingulate cortex and dorsolateral prefrontal cortex, seems to indicate a hypertrophic trend that does not reach significance.