Corrigendum: Brain scaling in mammalian evolution as a consequence of concerted and mosaic changes in numbers of neurons and average neuronal cell size

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A Corrigendum on

Brain scaling in mammalian evolution as a consequence of concerted and mosaic changes in numbers of neurons and average neuronal cell size
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It has come to our attention that some of the data on the cellular composition of the brain of artiodactyls, presented in Table 1 of Kazu et al. (2014) and used in this review, needed minor corrections, which were published in a Corrigendum to that paper.

While those corrections do not at all modify the conclusions of the present paper, some of the power exponents reported here were influenced in minor, non-significant ways. We provide those corrected power exponents below.

p. 4, Figure 2, top right—The mass of each brain structure varies as a similar, shared power function of the number of non-neuronal (other) cells in the structure of exponent 1.050 ± 0.018 (p < 0.0001).

p. 6, Figure 3, top: Mass of the cerebral cortex increases with number of neurons raised to an exponent of 1.694 ± 0.048 across non-primates.

p. 6, Figure 3, bottom: Neuronal density in the cerebral cortex decreases with number of neurons raised to an exponent of −0.693 ± 0.048 (p < 0.0001).

p. 9, Figure 4: In non-primates, non-eulipotyphlans, cerebellar mass increases with number of neurons raised to an exponent of 1.283 ± 0.035 (p < 0.0001) and cerebellar neuronal density scales with number of neurons raised to an exponent of −0.282 ± 0.035 (p < 0.0001).

Figure 7:
A—Neuronal density in the cerebral cortex scales with neuronal density in the rest of brain raised to an exponent of 0.876 ± 0.041, p < 0.0001 (excludes primates).

B—Neuronal density in the cerebellum scales with neuronal density in the rest of brain raised to an exponent of 0.442 ± 0.049, p < 0.0001 (excludes primates and eulipotyphlans).

C—Neuronal density in the olfactory bulb scales with neuronal density in the rest of brain raised to an exponent of 0.994 ± 0.118, p < 0.0001 (excludes primates and eulipotyphlans).
D—Neuronal density in the olfactory bulb scales with neuronal density in the cerebral cortex raised to an exponent of $1.139 \pm 0.113$, $p < 0.0001$ (excludes primates and eulipotyphlans).

E—Neuronal density in the cerebellum scales with neuronal density in the cerebral cortex raised to an exponent of $0.516 \pm 0.041$, $p < 0.0001$ (excludes primates and eulipotyphlans).

F—Neuronal density in the olfactory bulb scales with neuronal density in the cerebellum raised to an exponent of $1.706 \pm 0.161$, $p < 0.0001$ (includes all clades).

p. 12, Figure 8A—Artiodactyls gain neurons in the cerebral cortex faster than they gain neurons in the rest of brain, as a power function of exponent $1.552 \pm 0.056$, $p = 0.0013$, $r^2 = 0.997$ (excludes the giraffe).

p. 12, Figure 8B—Artiodactyls gain neurons in the cerebellum faster than they gain neurons in the rest of brain, as a power function of exponent $1.737 \pm 0.304$, $p = 0.0107$, $r^2 = 0.916$.

p. 14, Figure 9B—The number of neurons in the cerebellum varies as a power function of the number of neurons in the cerebral cortex with an exponent of $0.922 \pm 0.110$, $p = 0.0036$, across artiodactyls. The relationship for the ensemble of clades can also be fit with a linear function of slope $4.16$ ($p < 0.0001$, $r^2 = 0.985$).

p. 15, Figure 10A—Artiodactyls have on average $7.35 \pm 1.24$ neurons in the cerebral cortex to every neuron in the rest of brain. This ratio increases as a power function of the number of neurons in the rest of brain with an exponent of $0.904 \pm 0.132$ ($p = 0.0135$, $r^2 = 0.902$).

p. 16, Figure 10B—Artiodactyls have a ratio between numbers of neurons in the cerebellum and in the rest of brain of $38.32 \pm 6.19$.

p. 17—Artiodactyls have an average ratio of neurons in the cerebellum relative to the cerebral cortex of $5.28 \pm 0.31$.

p. 21, Figure 13:

A—The mass of the cerebral cortex increases across non-primates with the mass of the rest of brain raised to an exponent of $1.155 \pm 0.027$, $p < 0.0001$.

B—The mass of the cerebellum increases across non-primates with the mass of the rest of brain raised to an exponent of $1.054 \pm 0.019$, $p < 0.0001$.

C—The mass of the olfactory bulb increases across non-primates with the mass of the rest of brain raised to an exponent of $0.812 \pm 0.043$, $p < 0.0001$.

D—The relative mass of the cerebral cortex increases across all species in correlation with brain mass with a Spearman correlation $r^2 = 0.7840$, $p < 0.0001$.

E—The relative mass of the cerebellum varies across all species in correlation with brain mass with a Spearman correlation $r^2 = −0.5270$, $p = 0.0008$.

F—The relative mass of the rest of brain varies across all species in correlation with brain mass with a Spearman correlation $r^2 = −0.7994$, $p < 0.0001$.

p. 21, Figure 14—The cerebral cortex of artiodactyls gains mass as a function of the number of neurons in the rest of brain with exponent $2.759 \pm 0.145$, $p = 0.0028$. The cerebellum of artiodactyls gains mass as a function of the number of neurons in the rest of brain with exponent $2.142 \pm 0.492$, $p = 0.0489$.

p. 24, Figure S17—In artiodactyls, cerebral cortical mass increases as a power function of body mass with exponent $0.589 \pm 0.028$, $p = 0.0023$; rest of brain mass increases as a power function of body mass with exponent $0.378 \pm 0.056$, $p = 0.0215$; the number of neurons in the cerebral cortex scales with body mass raised to an exponent of $0.454 \pm 0.107$, $p = 0.0511$; and the number of neurons in the rest of brain scales with body mass raised to an exponent of $0.227 \pm 0.027$, $p = 0.0136$.

Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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