

Supplemental material

**A Volumetric and Functional Connectivity MRI Study of Brain Arginine-vasopressin Pathways in Autistic Children**

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**Table S1. Demographics and scale characteristics in children with ASD**

| <b>Subjects</b>    | <b>Age (years)</b> | <b>Gender</b> | <b>CARS score</b> | <b>ABC score</b> | <b>AQ-Child score</b> |
|--------------------|--------------------|---------------|-------------------|------------------|-----------------------|
| ASD01              | 5.0                | Female        | 30.0              | 87               | 37                    |
| ASD02              | 3.7                | Male          | 41.0              | 80               | 23                    |
| ASD03              | 4.8                | Male          | 30.0              | 63               | 22                    |
| ASD04              | 5.0                | Male          | 30.5              | 21               | 19                    |
| ASD05 <sup>a</sup> | 4.0                | Male          | -                 | -                | -                     |
| ASD06              | 4.0                | Male          | 39.5              | 63               | 27                    |
| ASD07              | 3.4                | Male          | 41.0              | 61               | 35                    |
| ASD08              | 2.9                | Female        | 37.0              | 26               | 42                    |
| ASD09              | 4.5                | Male          | 38.0              | 28               | 29                    |
| ASD10              | 3.1                | Male          | 33.0              | 32               | 32                    |
| ASD11              | 3.5                | Male          | 37.5              | 77               | 34                    |
| ASD12              | 5.0                | Male          | 34.0              | 68               | 31                    |
| ASD13              | 4.5                | Male          | 32.5              | 30               | 24                    |
| ASD14              | 4.0                | Male          | 36.0              | 59               | 33                    |

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<sup>a</sup>This child missed the CARS assessment and his parent questionnaire was technically invalid.

CARS, Childhood Autism Rating Scale; ABC, Autism Behavior Checklist; AQ-Child, Autism Spectrum Quotient Children's Version; ASD, autism spectrum disorder.

The normality of the characteristics (except for gender) was tested by the Shapiro-Wilk test.

**Table S2. Demographics and scale characteristics in TDC**

| <b>Subjects</b> | <b>Age (years)</b> | <b>Gender</b> | <b>ABC score</b> | <b>AQ-Child score</b> |
|-----------------|--------------------|---------------|------------------|-----------------------|
| TDC01           | 3.5                | Female        | 0                | 9                     |
| TDC02           | 5.5                | Male          | 2                | 18                    |
| TDC03           | 5.0                | Male          | 0                | 13                    |
| TDC04           | 5.0                | Male          | 5                | 16                    |
| TDC05           | 5.0                | Male          | 37               | 18                    |
| TDC06           | 4.0                | Male          | 11               | 13                    |
| TDC07           | 4.0                | Female        | 4                | 20                    |
| TDC08           | 4.0                | Male          | 15               | 19                    |
| TDC09           | 5.0                | Female        | 3                | 13                    |
| TDC10           | 4.0                | Male          | 3                | 24                    |
| TDC11           | 3.0                | Male          | 12               | 20                    |
| TDC12           | 5.0                | Male          | 20               | 17                    |
| TDC13           | 5.2                | Female        | 23               | 14                    |
| TDC14           | 4.8                | Male          | 15               | 28                    |

CARS, Childhood Autism Rating Scale; ABC, Autism Behavior Checklist; AQ-Child, Autism Spectrum Quotient Children's Version; TDC, typically developing children.

The normality of the characteristics (except for gender) were tested by the Shapiro-Wilk test.

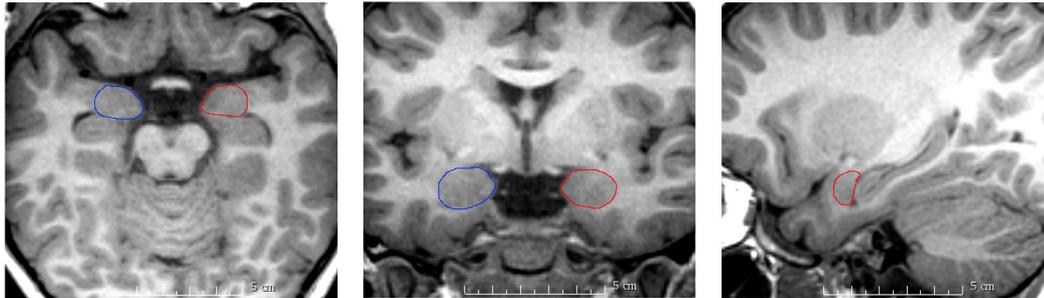


Fig. S1. Amygdala manual tracing in axial, coronal and sagittal planes (red, left; blue, right) in one participant's original-space brain. The amygdala is located within the temporal lobes, the superior aspect is shown to be partly continuous with the inferior margin of the claustrum, separated from the inferior putamen, and in close contact with the optic tract [1, 2].

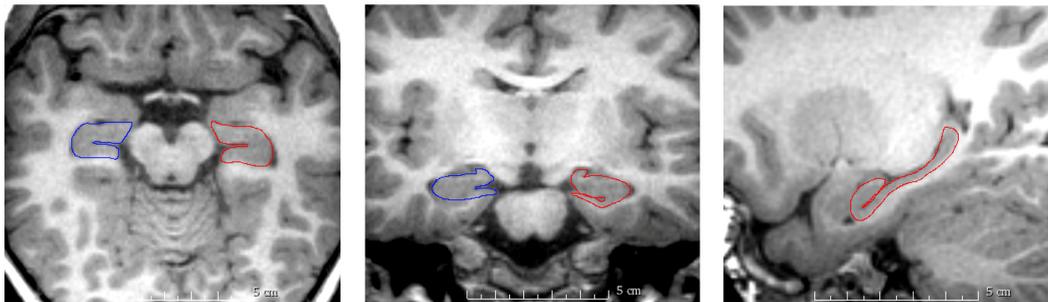


Fig. S2. Hippocampus manual tracing in axial, coronal and sagittal planes (red, left; blue, right) in one participant's original-space brain. The hippocampus is located in the mesial temporal lobe and protrudes into the temporal horn of the lateral ventricle. Its rostral extremity extends ventrally to the amygdala [1, 3]

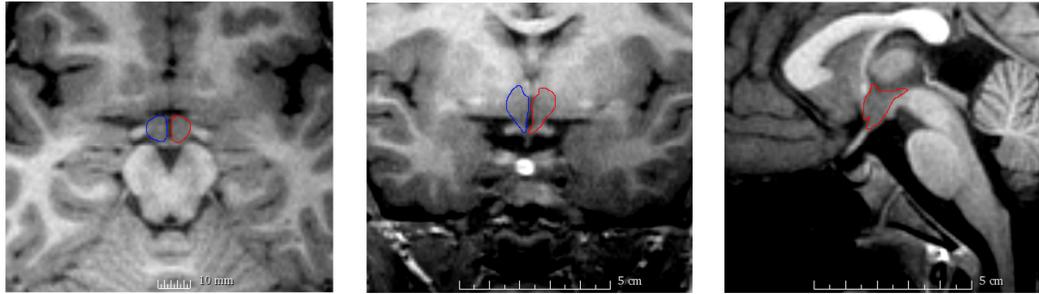


Fig. S3. Hypothalamus manual tracing in axial, coronal and sagittal planes (red, left; blue, right) in one participant's original-space brain. The hypothalamus lies ventral to the thalamic sulcus, extending from the lamina terminalis at the chiasmatal notch in the region of the optic chiasma through a vertical plane caudal to the mammillary body [1, 4]

## REFERENCES

1. Tamraz, J.C., et al., *Atlas of regional anatomy of the brain using MRI with functional correlations*. 2006, Springer: Berlin. p. 1 v.
2. Ortiz-Mantilla, S., et al., *Associations between the size of the amygdala in infancy and language abilities during the preschool years in normally developing children*. *Neuroimage*, 2010. **49**(3): p. 2791-9.
3. Schumann, C.M., et al., *The amygdala is enlarged in children but not adolescents with autism; the hippocampus is enlarged at all ages*. *J Neurosci*, 2004. **24**(28): p. 6392-401.
4. Lemaire, J.J., et al., *Maps of the adult human hypothalamus*. *Surg Neurol Int*, 2013. **4**(Suppl 3): p. S156-63.