

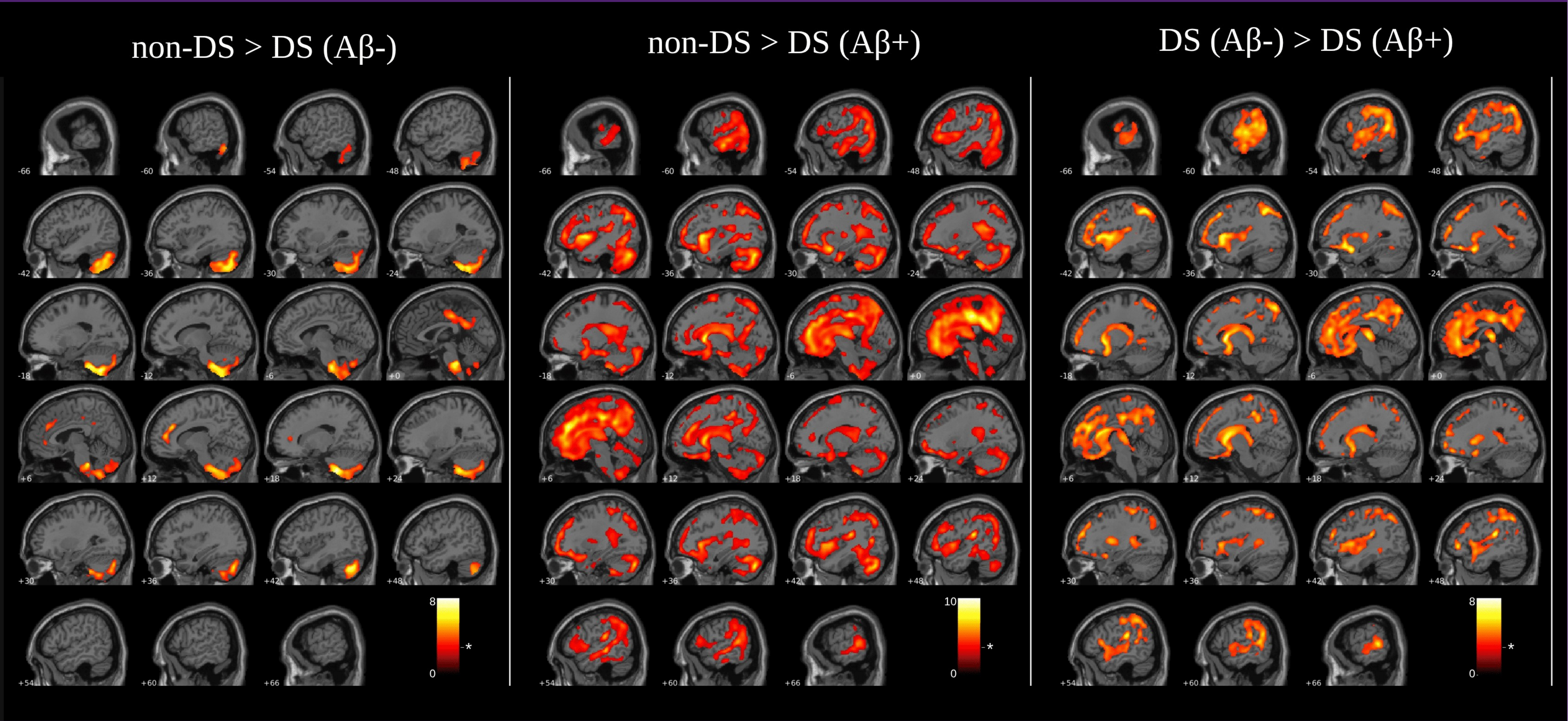
Amyloid-related Cerebral Perfusion in Adults with Down Syndrome

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INTRODUCTION	METHODS	CONCLUSIONS
Individuals with Down syndrome (DS) present early onset of Alzheimer’s disease (AD) biomarkers and reduction in brain volume across multiple regions, including the cerebellum. This study explores the [¹¹ C]PIB perfusion, a proxy to the cerebral blood flow (CBF), in the brain of adults with DS in comparison to neurotypical individuals.	Age-matched DS (n=20; 41.2±12.7 y.o.) and non-DS (n=13; 41.3±12.7 y.o.) adults underwent a 70-minute dynamic [¹¹ C]PIB PET-MR acquisition. MR-T1w images were used for volumes-of-interest segmentation. The centiloid (CL) metric was quantified and CL=18 was used as the cutoff for Aβ positivity. Relative tracer delivery rate (R1) maps were obtained using a voxel-wise basis-function approach of the SRTM2 kinetic model. The brainstem was adopted as reference tissue due to morphological differences in the cerebellum of DS individuals. Group-wise comparisons of R1 maps were carried out between non-DS, DS Aβ-, and DS Aβ+, using one-way ANOVA in SPM12 to evaluate perfusion differences at the voxel level. All p-values were corrected for family-wise error.	Our findings demonstrate that Aβ+ adults with DS exhibit widespread cerebral hypoperfusion encompassing regions classically affected in AD, which was not observed in Aβ- DS individuals, suggesting that these hemodynamic alterations are associated with AD pathology rather than DS-intrinsic neurovascular features. On the other hand, cerebellar hypoperfusion was observed in DS regardless of Aβ status, indicating that the cerebellum should not be used as reference tissue for perfusion measurements in cross-population comparisons involving DS.

RESULTS



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