von Economo neurons in autism: 
A stereologic study of the frontoinsular cortex in children

Neha Uppal*1, Micaela Santos*13, Camilla Butti1, Bridget Wicinski2, James Schmeidler7, Panteleimon Giannakopoulos34, Helmut Heinsen5, Christoph Schmitz6, Patrick R Hof1

1Department of Neuroscience, Mount Sinai School of Medicine, New York NY 10029, USA; 2Department of Psychiatry, Mount Sinai School of Medicine, New York NY 10029, USA; 3Department of Psychiatry, University Hospitals and School of Medicine, Geneva, Switzerland; 4Department of Psychiatry, University of Lausanne School of Medicine, Switzerland; 5Morphological Brain Research Unit, University of Wuerzburg, Germany; 6Institute of Anatomy, Ludwig-Maximilians-University of Munich, Germany

Results

Research Question
Are there differences in VEN number, morphology or distribution in the frontoinsular cortex associated with autism spectrum disorders?

VENs are large bipolar neurons found in layer V of the frontoinsular cortex (FI) and anterior cingulate cortex (ACC) of humans and other large brained mammals (Nimchinsky, 1995). They are speculated to be involved in intuitive assessments during complex social situations and thus are a very interesting putative target in disorders that involve social deficits, such as autism (Allman, 2005).

The FI is known to participate in the representation of polymodal internal sensations of bodily arousal and in their integration in processing emotional states (Craig, 2009). These functions have been consistently reported to be impaired in patients with autism (Hill et al., 2004).

These impairments give rise to the speculation that abnormalities in numbers or distribution of VENS could be implicated in the etiopathology of autism.

Methods

Region of Interest

Case Details

Seven postmortem brains from four patients with autism and three comparably aged controls were used in this study. Brains were divided medio sagittally and either the left or right side was available for each case. The tissue was fixed in 10% formalin for at least 3 months, followed by embedding in celloidin and cutting into complete series of 200 µm or 500 µm thick sections. Sections were stained with galacocyanin (Nissl stain).

Stereology – Optical Fractionator

Starting with a random section number, we systematically sampled throughout the FI. Using the Optical Fractionator probe, we quantified the number of VENS and pyramidal neurons in each case. For volume calculations, we used the Cavalieri probe.

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