

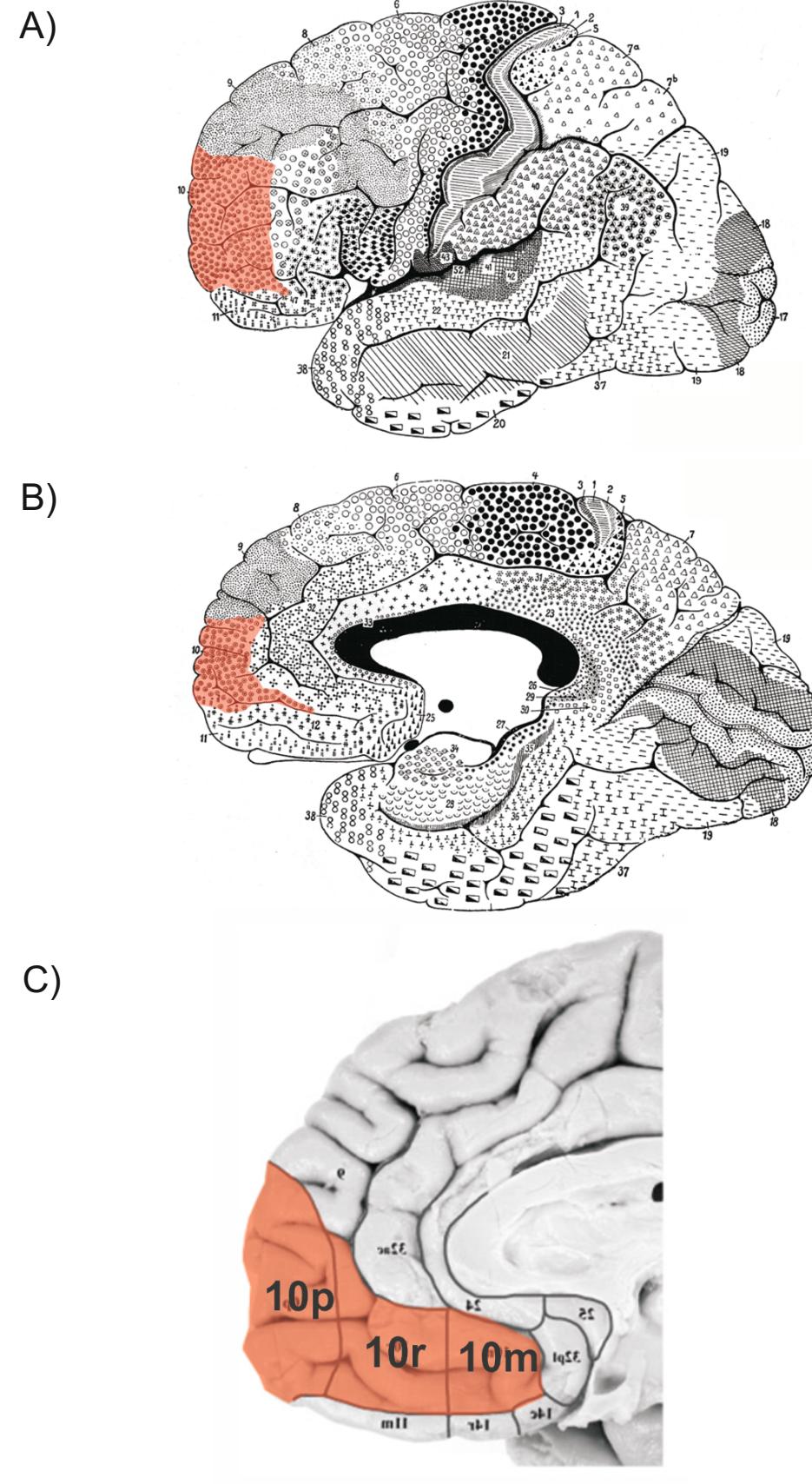
# Two new cytoarchitectonic areas of the human frontal pole

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JARA|BRAIN

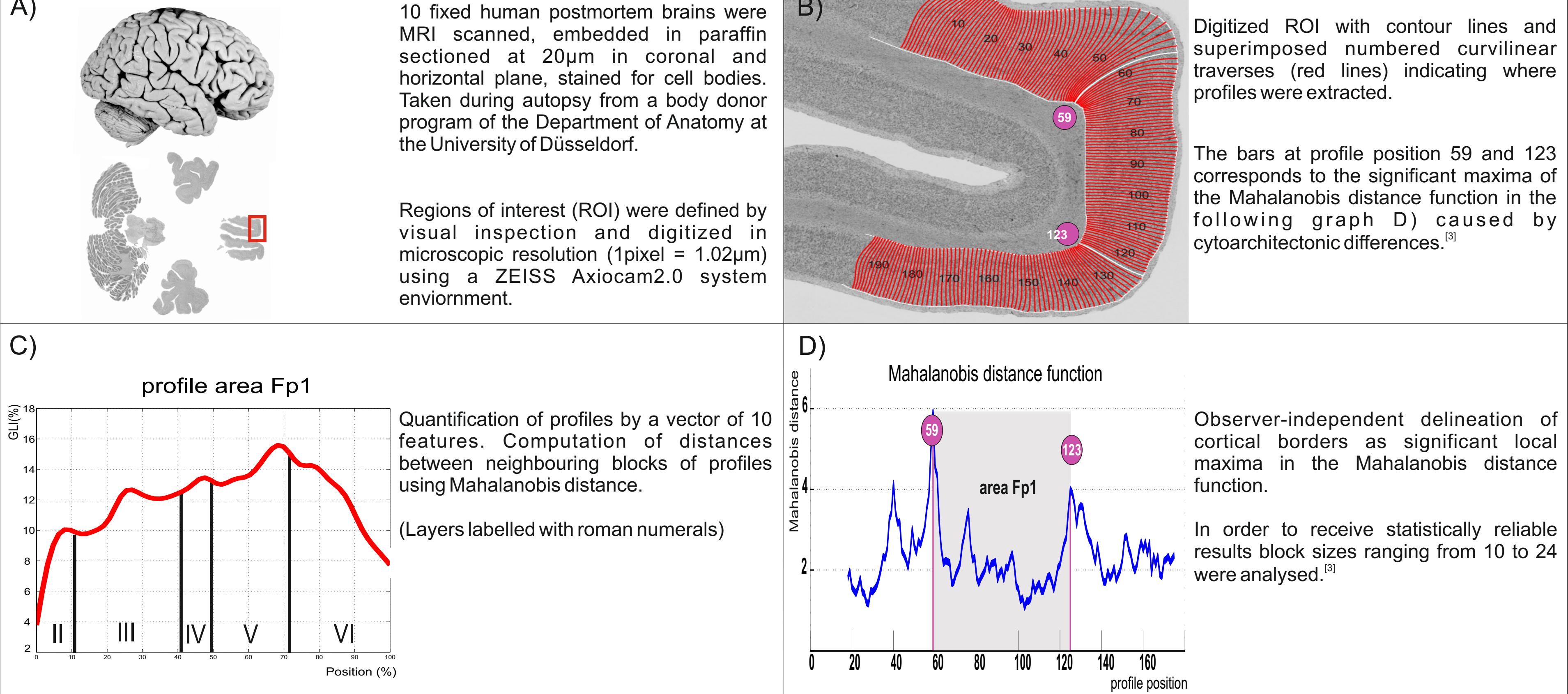
## INTRODUCTION



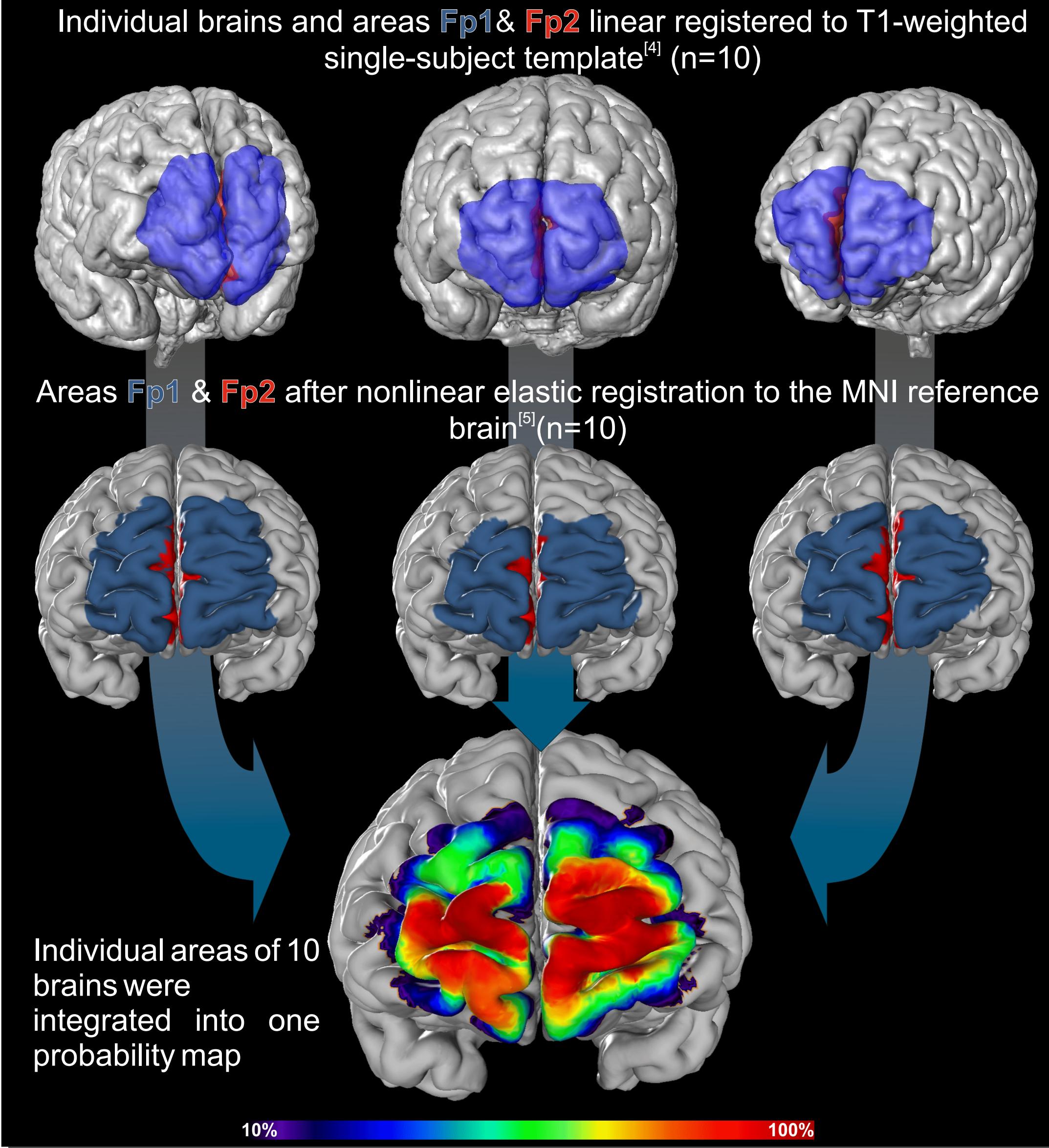
- Area 10 of the frontal pole of the human brain occupies a larger proportion of the brain than in any other species.
- Area 10 is involved in higher cognitive functions such as planning of future actions and the ability to draw analogies.
- Its localization in stereotaxic space and intersubject variability, however, are still unknown.

Published cytoarchitectonic maps of the human frontal pole.  
 - Korbinian Brodmann<sup>[1]</sup> (A,B)  
 - Ongur and colleagues<sup>[2]</sup> (C)  
 (subareas 10p, 10r, 10m)

## OBSERVER-INDEPENDENT BRAIN MAPPING



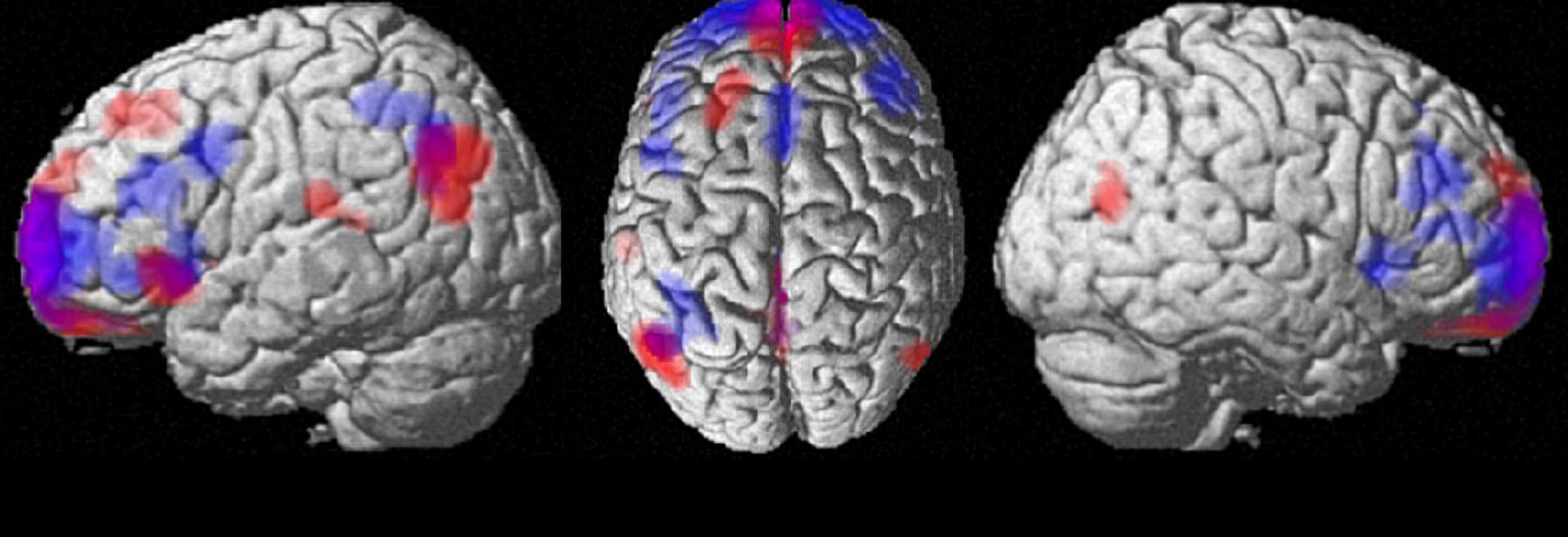
## 3D RECONSTRUCTION



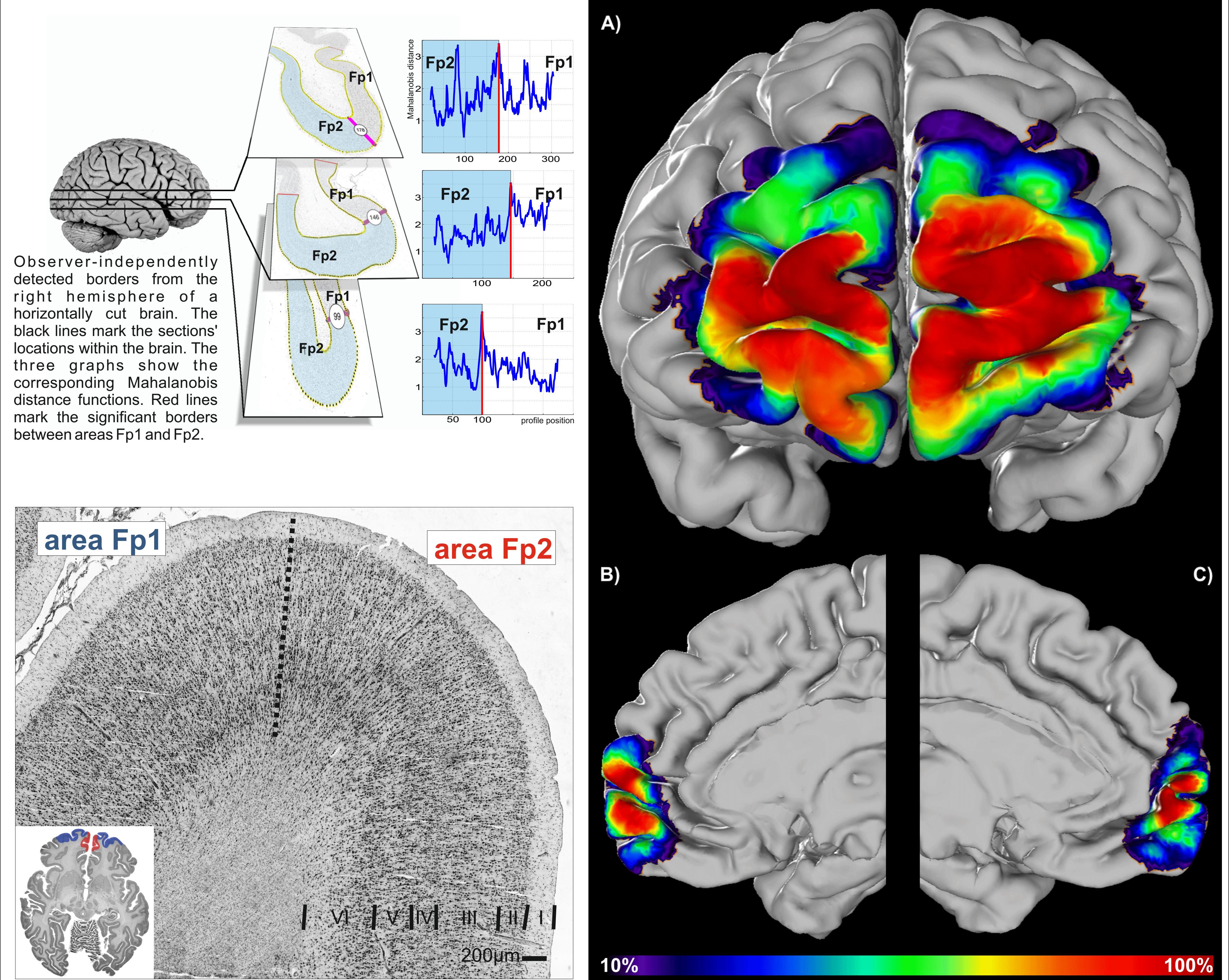
## META-ANALYTIC CONNECTIVITY MODELLING<sup>[6]</sup>

- Investigation of functional connectivity by coordinate-based meta-analysis of task-related activations
- Database driven approach(Brainmap.org)<sup>[7,8]</sup>
- Delineation of concurrent activation patterns

Regions that are co-activated above chance with areas Fp1 & Fp2 as seed regions



## CYTOARCHITECTURE OF AREA Fp1 & Fp2 AND PROBABILISTIC MAPS



## CONCLUSIONS

- Our probabilistic map represents the first stereotaxic map of the frontal pole.
- Area Fp2 shows a significantly smaller extent than described in a previous study<sup>[2]</sup>, which was based on pure visual architectonic analyses.
- The map provides an anatomical basis for comparison with in vivo neuroimaging data for studying structure-function relationships.
- For the first time, an observer-independent subdivision into two distinct areas was demonstrated.
- The meta-analysis showed that areas Fp1 and Fp2 do not only differ with respect to their cytoarchitecture, but also functionally.

### References:

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[5]

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