

Is our Nose dialect with our Eyes?

(An unrevealed Olfactory-Saccadic Pathway)

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Abstract

Background: Our “Team NeurON” made an attempt on tracing the existence of neural structural connectivity between the “Piriform and Entorhinal Cortex (Brodmann Areas 27, 28 and 34) with Motor cortex (Brodmann Areas 4 and 6)”, called Olfactory-Motor pathway. We stumbled across some new structural connections from “Piriform and Entorhinal Cortex with Frontal Eye Field (FEF) (Brodmann Areas 8), which failed to be mentioned by various workers on their previous findings. This new finding, encouraged us to further pursue on this connection and identify its functional correlations.

Objectives: Aimed to identify the existence of neural structural connectivity between “Piriform and Entorhinal Cortex to Frontal Eye Field (FEF),” and correlates with its functional importance, using “Diffusion Imaging fiber Tractography”.

Methods: The observational analysis, used ten healthy adults, ultra-high b-value, diffusion MRI Datasets from an Open access platform. The datasets, ranging from both sex, between 20–59 years, with mean age of 31.1 years. The analysis process includes, data processing and fiber tractography using software tools.

Results: The fibers were traced, and confirmed its structural extension from “Piriform and Entorhinal Cortex to Frontal Eye Field (FEF), which involves in control the movements of neck and eyeball gaze, towards the spatial orientation of olfactory stimulus.

Conclusion: This new observation, provide insight to understand the structural existence and functional correlations between “Piriform and Entorhinal Cortex to Frontal Eye Field (FEF), making possible the results in generation of neck and eyeball gaze movements towards the spatial orientation of olfactory stimulus.

Keywords: Tractography, Piriform Cortex, Entorhinal cortex, Saccadic eye movements, olfactory pathways, Frontal Eye Field.