**Functional connectivity of the orbitofrontal cortex, anterior cingulate cortex,**

**and inferior frontal gyrus in humans**

**Cortex 123: 185-199 (2020)**

**Supplementary Material**

Jingnan Dua,b,#, Edmund T. Rollsa,c,d,#, Wei Chenga, b,\*,Yu Lie,#, Weikang Gonga, Jiang Qiue, andJianfeng Fenga, 2,3 \*\*

a. Institute of Science and Technology for Brain-inspired Intelligence, Fudan University, Shanghai, 200433, PR China

b. Key Laboratory of Computational Neuroscience, Institute of Science and Technology for Brain-inspired Intelligence, Fudan University, Ministry of Education, China

c. Department of Computer Science, University of Warwick, Coventry CV4 7AL, UK

d. Oxford Centre for Computational Neuroscience, Oxford, UK

e. Key Laboratory of Cognition and Personality (SWU), Ministry of Education, Chongqing, China.

# Co-first author.

**Table S1.** The anatomical regions defined in each hemisphere and their label in the automated anatomical labelling atlas AAL3 (Rolls, Huang, Lin, Feng, & Joliot, 2020). The regions that have been redefined in AAL3 compared to AAL2 (Rolls, Joliot, & Tzourio-Mazoyer, 2015) are shown in italics. Column 4 provides a set of possible abbreviations for the anatomical descriptions.

|  |  |  |  |
| --- | --- | --- | --- |
| NO. | ANATOMICAL DESCRIPTION | LABELAal3.nii.gz | POSSIBLEABBREVIATION |
| 1,2  | Precentral gyrus | Precentral | PreCG |
| 3, 4 | Superior frontal gyrus, dorsolateral | Frontal\_Sup | SFG |
| 5, 6 | Middle frontal gyrus | Frontal\_Mid | MFG |
| 7, 8 | Inferior frontal gyrus, opercular part | Frontal\_Inf\_Oper | IFGoperc |
| 9, 10 | Inferior frontal gyrus, triangular part | Frontal\_Inf\_Tri | IFGtriang |
| 11, 12 | Inferior frontal gyrus, pars orbitalis  | Frontal\_Inf\_Orb | IFGorb |
| 13, 14 | Rolandic operculum | Rolandic\_Oper | ROL |
| 15, 16 | Supplementary motor area | Supp\_Motor\_Area | SMA |
| 17, 18 | Olfactory cortex | Olfactory | OLF |
| 19, 20 | Superior frontal gyrus, medial | Frontal\_Sup\_Med | SFGmedial |
| 21, 22 | Superior frontal gyrus, medial orbital | Frontal\_Med\_Orb | PFCventmed or VMPFC |
| 23, 24 | Gyrus rectus | Rectus | REC |
| 25, 26 | Medial orbital gyrus | OFCmed | OFCmed |
| 27, 28 | Anterior orbital gyrus | OFCant | OFCant |
| 29, 30 | Posterior orbital gyrus | OFCpost | OFCpost |
| 31, 32 | Lateral orbital gyrus | OFClat | OFClat |
| 33, 34 | Insula | Insula | INS |
| *35, 36* | *Anterior cingulate & paracingulate gyri* | Cingulate\_Ant | ACC |
| 37, 38 | Middle cingulate & paracingulate gyri | Cingulate\_Mid | MCC |
| 39, 40 | Posterior cingulate gyrus | Cingulate\_Post | PCC |
| 41, 42 | Hippocampus | Hippocampus | HIP |
| 43, 44 | Parahippocampal gyrus | ParaHippocampal | PHG |
| 45, 46 | Amygdala | Amygdala | AMYG |
| 47, 48 | Calcarine fissure and surrounding cortex | Calcarine | CAL |
| 49, 50 | Cuneus | Cuneus | CUN |
| 51, 52 | Lingual gyrus | Lingual | LING |
| 53, 54 | Superior occipital gyrus | Occipital\_Sup | SOG |
| 55, 56 | Middle occipital gyrus | Occipital\_Mid | MOG |
| 57, 58 | Inferior occipital gyrus | Occipital\_Inf | IOG |
| 59, 60 | Fusiform gyrus | Fusiform | FFG |
| 61, 62 | Postcentral gyrus | Postcentral | PoCG |
| 63, 64 | Superior parietal gyrus | Parietal\_Sup | SPG |
| 65, 66 | Inferior parietal gyrus, excluding supramarginal and angular gyri | Parietal\_Inf | IPG |
| 67, 68 | SupraMarginal gyrus | SupraMarginal | SMG |
| 69, 70 | Angular gyrus | Angular | ANG |
| 71, 72 | Precuneus | Precuneus | PCUN |
| 73, 74 | Paracentral lobule | Paracentral\_Lobule | PCL |
| *75, 76* | *Caudate nucleus* | Caudate | CAU |
| *77, 78* | *Lenticular nucleus, Putamen* | Putamen | PUT |
| 79, 80 | Lenticular nucleus, Pallidum | Pallidum | PAL |
| 81, 82 | Thalamus | Thalamus | THA |
| 83, 84 | Heschl’s gyrus | Heschl | HES |
| 85, 86 | Superior temporal gyrus | Temporal\_Sup | STG |
| 87, 88 | Temporal pole: superior temporal gyrus | Temporal\_Pole\_Sup | TPOsup |
| 89, 90 | Middle temporal gyrus | Temporal\_Mid | MTG |
| 91, 92 | Temporal pole: middle temporal gyrus | Temporal\_Pole\_Mid | TPOmid |
| 93, 94 | Inferior temporal gyrus | Temporal\_Inf | ITG |
| 95, 96 | Crus I of cerebellar hemisphere | Cerebellum\_Crus1 | CERCRU1 |
| 97, 98 | Crus II of cerebellar hemisphere | Cerebellum\_Crus2 | CERCRU2 |
| 99, 100 | Lobule III of cerebellar hemisphere | Cerebellum\_3 | CER3 |
| 101, 102 | Lobule IV, V of cerebellar hemisphere | Cerebellum\_4\_5 | CER4\_5 |
| 103, 104 | Lobule VI of cerebellar hemisphere | Cerebellum\_6 | CER6 |
| 105, 106 | Lobule VIIB of cerebellar hemisphere | Cerebellum\_7b | CER7b |
| 107, 108 | Lobule VIII of cerebellar hemisphere | Cerebellum\_8 | CER8 |
| 109, 110 | Lobule IX of cerebellar hemisphere | Cerebellum\_9 | CER9 |
| 111, 112 | Lobule X of cerebellar hemisphere | Cerebellum\_10 | CER10 |
| 113 | Lobule I, II of vermis | Vermis\_1\_2 | VER1\_2 |
| 114 | Lobule III of vermis | Vermis\_3 | VER3 |
| 115 | Lobule IV, V of vermis | Vermis\_4\_5 | VER4\_5 |
| 116 | Lobule VI of vermis | Vermis\_6 | VER6 |
| 117 | Lobule VII of vermis | Vermis\_7 | VER7 |
| 118 | Lobule VIII of vermis | Vermis\_8 | VER8 |
| 119 | Lobule IX of vermis | Vermis\_9 | VER9 |
| 120 | Lobule X of vermis | Vermis\_10 | VER10 |

**Table S2.** The extra anatomical regions defined AAL3 (Rolls et al., 2020) in each hemisphere (compared to AAL2 (Rolls et al., 2015)) and their label. Column 4 provides a set of possible abbreviations for the anatomical descriptions. In AAL3, the label shown in column 3 is followed by the number shown in column 1. In most cases, the first number in a row is for the left hemisphere, and the second number is for the right hemisphere. This does not apply to the raphe, which is a midline structure.

|  |  |  |  |
| --- | --- | --- | --- |
| NO. | ANATOMICAL DESCRIPTION | LABELaal3.nii.gz | POSSIBLEABBREVIATION |
| 121, 122  | Thalamus, Anteroventral Nucleus | Thal\_AV | tAV |
| 123, 124 | Lateral posterior | Thal\_LP | tLP |
| 125, 126 | Ventral anterior | Thal\_VA | tVA |
| 127, 128 | Ventral lateral | Thal\_VL | tVL |
| 129, 130 | Ventral posterolateral | Thal\_VPL | tVPL |
| 131, 132 | Intralaminar | Thal\_IL | tIL |
| 133, 134 | Reuniens | Thal\_Re | tRe |
| 135, 136 | Mediodorsal medial magnocellular | Thal\_MDm | tMDm |
| 137, 138 | Mediodorsal lateral parvocellular | Thal\_MDl | tMDl |
| 139, 140 | Lateral geniculate | Thal\_LGN | tLGN |
| 141, 142 | Medial Geniculate | Thal\_MGN | tMGN |
| 143, 144 | Pulvinar anterior | Thal\_PuA | tPuA |
| 145, 146 | Pulvinar medial | Thal\_PuM | tPuM |
| 147, 148 | Pulvinar lateral | Thal\_PuL | tPuL |
| 149, 150 | Pulvinar inferior | Thal\_PuI | tPuI |
| 151, 152 | Anterior cingulate cortex, subgenual | ACC\_sub | ACCsub |
| 153, 154 | Anterior cingulate cortex, pregenual | ACC\_pre | ACCpre |
| 155, 156 | Anterior cingulate cortex, supracallosal | ACC\_sup | ACCsup |
| 157, 158 | Nucleus accumbens | N\_Acc | Nacc |
| 159, 160 | Ventral tegmental area | VTA | VTA |
| 161, 162 | Substantia nigra, pars compacta | SN\_pc | SNpc |
| 163, 164 | Substantia nigra, pars reticulata | SN\_pr | SNpr |
| 165, 166 | Red nucleus | Red\_N | RedN |
| 167, 168 | Locus coeruleus | LC | LC |
| 169 | Raphe nucleus, dorsal | Raphe\_D | RapheD |
| 170 | Raphe nucleus, median | Raphe\_M | RapheM |

Fig. S1. The 24 parcels shown on coronal slices. The Y value in MNI space is provided.

References

Rolls, E. T., Huang, C. C., Lin, C. P., Feng, J., & Joliot, M. (2020). Automated anatomical labelling atlas 3. *Neuroimage, 206*, 116189. doi: 10.1016/j.neuroimage.2019.116189

Rolls, E. T., Joliot, M., & Tzourio-Mazoyer, N. (2015). Implementation of a new parcellation of the orbitofrontal cortex in the automated anatomical labeling atlas. *Neuroimage, 122*, 1-5. doi: 10.1016/j.neuroimage.2015.07.075