

Supplementary Table 1.

| Site | size | t-value | FWE | x | y | z |
|--|-------------|----------------|------------|----------|----------|----------|
| R Parietal Operculum | 3262 | 20.77 | < 0.001 | 54 | -28 | 22 |
| R Central Operculum | | 15.15 | | 56 | 2 | 4 |
| R Insular Cortex | | 13.80 | | 34 | -20 | 14 |
| R Postcentral Gyrus | 1120 | 16.60 | < 0.001 | 12 | -38 | 68 |
| R Precentral Gyrus | | 12.64 | | 4 | -14 | 64 |
| L Parietal Operculum | 2228 | 14.57 | < 0.001 | -52 | -34 | 20 |
| L Central Operculum | | 12.58 | | -52 | -2 | 2 |
| L Postcentral Gyrus/Supramarginal Gyrus | | 12.29 | | -62 | -24 | 24 |
| R Anterior Cingulate Cortex | 403 | 8.19 | < 0.001 | 6 | -8 | 42 |
| L Paracingulate Gyrus | | 7.14 | | -6 | 12 | 46 |
| R Anterior Cingulate Cortex | | 6.29 | | 4 | 2 | 44 |
| R Putamen | 31 | 6.35 | 0.001 | 20 | 12 | -8 |

Anatomical site, cluster size (minimum size of 10 voxels), maximum t-value, p-values per cluster corrected for multiple comparisons using a family-wise error (FWE) rate approach ($p < 0.05$) and Montreal Neurological Institute-coordinates of the local maxima for the main effect of P30 pooled across subjects. L, left; R, right.

Supplementary Table 2. Spearman's correlations between P30 BOLD signal and glutamate as well as between P30 BOLD signal and GABA in rACC and thalamus.

| | rACC glutamate - BOLD | | | | THALAMUS glutamate - BOLD | | | | rACC GABA - BOLD | | | | THALAMUS GABA - BOLD | | | | |
|-----------------|-----------------------|----------------|----------|----------------|---------------------------|----------------|----------|----------------|------------------|----------------|----------|----------------|----------------------|----------------|-------------------|----------------|--------|
| | Absolute | | Relative | | Absolute | | Relative | | Absolute | | Relative | | Absolute | | Relative compound | | |
| | compound | concentrations | compound | concentrations | compound | concentrations | compound | concentrations | compound | concentrations | compound | concentrations | compound | concentrations | compound | concentrations | |
| | N | | | | | | | | | | | | | | | | |
| | (rACC/thalamus) | | r | p-value | r | p-value | r | p-value | r | p-value | r | p-value | r | p-value | r | p-value | |
| ACROSS | | | | | | | | | | | | | | | | | |
| | 94/98 | -0.0796 | 0.4460 | -0.0092 | 0.9299 | -0.0872 | 0.3933 | -0.0116 | 0.9096 | 0.0698 | 0.5041 | 0.0810 | 0.4376 | -0.0669 | 0.5129 | -0.0464 | 0.6500 |
| SUBJECTS | | | | | | | | | | | | | | | | | |
| FM | 61/64 | -0.2491 | 0.0531 | -0.1574 | 0.2250 | -0.1099 | 0.3864 | 0.0903 | 0.4768 | 0.1455 | 0.2631 | 0.1772 | 0.1719 | -0.0008 | 0.9951 | 0.0027 | 0.9831 |
| HC | 33/34 | 0.1654 | 0.3560 | 0.2814 | 0.1126 | -0.0918 | 0.6042 | 0.1545 | 0.3816 | -0.0003 | 0.9985 | -0.0010 | 0.9956 | -0.2404 | 0.1709 | -0.1691 | 0.3389 |
| HAB | 55/55 | -0.0203 | 0.8830 | 0.0742 | 0.5891 | -0.1670 | 0.2231 | -0.0716 | 0.6036 | 0.1029 | 0.4549 | 0.1305 | 0.3423 | -0.1633 | 0.2336 | -0.1758 | 0.2155 |
| MLAB | 39/43 | -0.1630 | 0.3204 | -0.1180 | 0.4729 | -0.0190 | 0.9036 | 0.0616 | 0.6938 | 0.0009 | 0.9956 | -0.0078 | 0.9624 | 0.0743 | 0.6358 | 0.0947 | 0.5457 |

FM, fibromyalgia; HC, healthy controls; HAB, high affinity binders; MLAB, mixed/low affinity binders; rACC, rostral anterior cingulate cortex; BOLD, blood oxygen level-dependent; GABA, γ -aminobutyric acid.