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Corrigendum to “Mind-body interactions in the regulation of airway inflammation in asthma: A PET study of acute and chronic stress” [*Brain Behav. Immun.* 58 (2016) 18–30]

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The authors regret that in this article, there was an error in the processing of the PET data for four participants, such that the order of the challenge conditions (stress or control) was incorrectly specified. As a consequence, the PET data were reprocessed. In reprocessing the data the general pipeline remained the same but FSL- and ANTS-based tools were used rather than SPM12. Only results pertaining to the PET data are affected by this error. The results from the corrected analysis are more straightforward and in better alignment with relationships between emotion and inflammation previously reported by our group and others. Some results from the original manuscript, however, were not present in the corrected analysis. In particular, results involving glucose metabolism in the anterior insula and its correlates, together with the conclusions drawn from these results, are invalid as a result of the challenge condition coding error. On the other hand, involvement of the anterior insula in the relationship between psychological stress and airway inflammation in asthma is still indicated by the corrected analyses. Several of the correlations between glucose metabolism in the insula and peripheral or behavioral measures change direction after the

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correction, which also better aligns the corrected results with predominant trends in the literature, indicating that glucose metabolism in anterior, mid, and posterior insula is associated with greater airway inflammation and poorer psychological function. All other conclusions drawn from the PET results remain valid. The results and conclusions pertaining to the peripheral physiological and self-report data are unaffected by this error. Table 1 provides a detailed description of each cluster reported in the published manuscript and how it is impacted by the error correction and data reprocessing. In addition, Figs. 1–4 compare figures presented in the published article to the same figures with the reprocessed data.

In summary, the major consequence of the error reported here is a change in the effect of psychological stress on glucose metabolism in the anterior insula from a group $\times$ challenge interaction to a main effect of challenge, indicating that glucose metabolism in the anterior insula was greater during the stress compared to control condition. The original effect was counterintuitive and this change brings the observation into greater accordance with the literature on the relationships between stress and inflammation and insula function, and continues to suggest a role for the anterior insula in relationship between stress and airway inflammation in asthma.

The authors would like to apologise for any inconvenience caused.

Fig. 1.

Left (panels A–D): Original figure 4 in published article. Right (panels E–H): Former figure 4 with reprocessed data. (E) Cluster showing a main effect of challenge (stress > control) in the insula ROI analysis (thresholded at $p < 0.05$ corrected). (F) Mean glucose metabolism extracted from the cluster shown in (A) for each condition and group. This plot is provided only to show the data over the significant voxels, and inferences are not provided since the voxel-wise analysis and the ROI-averaged analyses utilize the same contrast, which is a case of circular analysis. (G) Overlap (or lack thereof) of the cluster showing a main effect of challenge in the right insula in the current data (violet) with the cluster showing a group $\times$ challenge $\times$ valence interaction (blue), and correlation with sputum EOS (green) published in Rosenkranz et al. (2012). (H) Overlap between erroneous published cluster (A, red) and the cluster showing a main effect of challenge (E, violet).

Fig. 2.

Top (panels A–B): Original figure 5 in published article. Bottom (panels C–D): Former figure 5 with reprocessed data. (C) Cluster showing a group $\times$ challenge interaction in the ACC ROI analysis, thresholded at $p < 0.05$ uncorrected. (D) Mean glucose metabolism extracted from the cluster shown in (C) for each condition and group. This plot is provided only to show the data over the significant voxels, and inferences are not provided since the voxel-wise analysis and the ROI-averaged analyses utilize the same contrast, which is a case of circular analysis.

Fig. 3. Comparison between published (A) and reprocessed (B) data presented in published figure 6. Both figures show the positive association between glucose metabolism in the mid-insula during performance of the TSST, relative to the control challenge (stress-control), and FeNO averaged across measurements. Images thresholded at (A) $p < 0.05$, corrected and (B) $p < 0.05$, uncorrected.

Fig. 4.

Comparison between published (top panels) and reprocessed (bottom panels) data presented in published figure 7. (A & C): Glucose metabolism in the MCC during performance of the TSST, relative to the control task (stress-control), and the increase in IL23A from baseline to post-stress, relative to post-control. Panel A shows the original published cluster and panel C shows this effect in the reprocessed data. (B & D): Glucose metabolism in the ACC during performance of the TSST, relative to the control task (stress-control), and the increase in IL1R1 from baseline to post-stress, relative to post-control. Panel B shows the original published cluster and panel D shows this effect in the reprocessed data. Images thresholded at (A) $p < 0.05$ corrected, (B) $p < 0.06$, corrected, (C & D) $p < 0.05$ uncorrected.

Table 1

Consequences of PET reprocessing on clusters reported in published manuscript. Note: unless otherwise indicated, cluster sizes correspond to a $p < 0.05$, uncorrected threshold.

Cluster	Effect	Direction	Cluster size	Consequences of reprocessing
R ant insula	Group $\times$ condition interaction	High (control > stress) Low (stress > control)	old: 286 new: 201*	Interaction becomes a main effect of condition in this region (stress > control). *Cluster size of the main effect in the reprocessed data is thresholded at $p = 0.05$ corrected, whereas the cluster size of the published effect is thresholded at $p = 0.05$ uncorrected
R MCC	Group $\times$ condition interaction	High (stress > control) Low (control > stress)	old: 102 new: 428	This effect becomes larger and more pronounced. When this analyses is thresholded at a corrected $p = 0.05$, 5 voxels survive
R mid insula	Correlation with mean FeNO	+	old: 128 ($p = 0.05$) new: 41 ($p = 0.06$)	This effect is not present at the published threshold of $p = 0.05$ corrected, but present at $p = 0.06$ corrected. Zero voxels are significant at a corrected threshold of $p = 0.05$
Bilateral mid-insula	Correlation with IL1R1 change	+	old: 593 new: 531	Effect is still present, but location is more ventral anterior and right sided. Peak voxel from published cluster is contained in new cluster. Also a large cluster (345 voxels) shows this effect in the L mid to posterior insula
R post insula	Correlation with blood EOS 24 h-post change	+	old: 230 new: 97	Effect is still present and contains the peak voxel from the published cluster
R post ventral insula	Correlation with cort AUC (stress-control)	+	old: 26 new: 71	Effect is still present and contains the peak voxel from the published cluster. There is also a cluster in the L dorsal mid-insula that shows this effect (113 voxels)
R ant insula	Correlation with sputum EOS 24 h-post change	–	old: 186	This effect is no longer present in the location of the published cluster. However, there are clusters showing a positive correlation in the mid and posterior insula
Bilateral ventral ant to mid insula	Correlation with ACQ score	–	old: 420	This effect is no longer present in the location of the published cluster, but a cluster in the L dorsal mid-insula is present. In addition there is a cluster in the dorsal anterior insula showing a positive correlation
L ant insula	Correlation with BDI score	–	old: 423 new: 283 (R dorsal ant insula positive correlation)	This effect is no longer present in the location of the published cluster and there are no clusters showing a negative correlation in the insula. There are now clusters in the R dorsal ant insula, R ventral post insula, and L dorsal post insula showing a positive correlation
L ant insula	Correlation with STAI score	–	old: 391 new: 127 (R dorsal ant insula positive correlation)	This effect is no longer present in the location of the published cluster and there are no clusters showing a negative correlation in the insula. There is now a cluster showing a positive correlation in the R dorsal ant to mid-insula
L ant insula	Correlation with cortisol AUC (stress-control)	–	old: 216 new: 377 (R ant insula)	This effect is no longer present in the location of the published cluster, but there are clusters showing this effect in R ant insula and L post ventral insula
L ant insula frontal operc.	Correlation with IL1R1 change	–	old: 86	This effect is no longer present in the insula
MCC	Correlation with IL23A change	+	old: 39* new: 115	This effect is still present, but only at a threshold of $p = 0.05$ uncorrected. *Cluster size at a corrected $p = 0.05$ threshold. Zero voxels are significant at this threshold in reprocessed data
Peri-genual ACC	Correlation with IL1R1 change	+	old: 65* new: 68	This effect is no longer present in the location of the published cluster at a corrected threshold, but there is a cluster showing this effect in the subcallosal region of the ACC at a threshold of $p < 0.05$ uncorrected. *Cluster size at a corrected threshold of $p = 0.05$

Cluster	Effect	Direction	Cluster size	Consequences of reprocessing
				corrected. Zero voxels present at this threshold in reprocessed data
Dorsal ACC to MCC	Correlation with blood EOS 24 h-post change	+	old: 533 new: 337	This effect is still present
Supra and perigenual ACC	Correlation with amylase AUC (stress-control)	+	old: 199 new: 45	This effect is still present, but smaller, and is more perigenual than supragenual
MCC	Correlation with BDI	+	old: 54 new: 527	This effect is still present and larger. New cluster contains the peak of the published cluster
MCC	Correlation with Mean FeNO	+	old: 266 new: 471	This effect is still present and larger. New cluster contains the peak of the published cluster
MCC	Correlation with amylase AUC (stress-control)	–	old: 38 new: 26	This effect is still present
Subgenual ACC	Correlation with STAI score	–	old: 260	This effect is no longer present anywhere in the ACC
Subgenual ACC	FeNO 4 h post-task difference	–	old: 74 new: 187 (dorsal ACC)	This effect is no longer present in the location of the published cluster. However, a cluster showing this effect is present in the dorsal ACC
Subgenual ACC		–	old: 31	This effect is no longer present anywhere in the ACC