

# Supplementary Information:

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## Distinct metabolic patterns of neuropsychiatric systemic lupus erythematosus on hierarchical cluster analysis

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# Online resource 6: Correlation between FDG uptake and SLEDAI-2K score

## Methods

- For each region in the atlas, we performed a correlation between FDG uptake and the composite disease activity score SLEDAI-2K for all subjects irrespective of cluster membership. We had no information on the SLEDAI-2K for one subject.
- Multiple comparisons were corrected using the False Discovery Rate (FDR) procedure using the Benjamini-Hochberg procedure with a  $q < 0.05$ .
- We also calculate a linear regression between SLEDAI-2K and the FDG uptake in 2 composite regions defined as those regions where FDG uptake in subjects belonging to cluster 1 was more than the FDG uptake in subjects belonging to cluster 2 (and vice versa).

## Negative correlations

| region ID Name    | r     | uncorrected p (surviving FDR correction) |
|-------------------|-------|------------------------------------------|
| 23MFG_L_7_5_8vl   | -0.67 | 6.20E-07                                 |
| 143IPL_L_6_5_39rv | -0.59 | 1.80E-05                                 |
| 15MFG_L_7_1_9-46d | -0.58 | 2.80E-05                                 |
| 5SFG_L_7_3_9l     | -0.58 | 3.40E-05                                 |
| 3SFG_L_7_2_8dl    | -0.55 | 9.40E-05                                 |
| 31IFG_L_6_2_IFS   | -0.54 | 1.10E-04                                 |
| 141IPL_L_6_4_40c  | -0.54 | 1.30E-04                                 |
| 1SFG_L_7_1_8m     | -0.51 | 3.50E-04                                 |
| 6SFG_R_7_3_9l     | -0.49 | 7.10E-04                                 |
| 17MFG_L_7_2_IFJ   | -0.48 | 7.40E-04                                 |
| 11SFG_L_7_6_9m    | -0.48 | 7.80E-04                                 |
| 25MFG_L_7_6_6vl   | -0.48 | 8.40E-04                                 |
| 24MFG_R_7_5_8vl   | -0.47 | 1.10E-03                                 |
| 16MFG_R_7_1_9-46d | -0.45 | 1.70E-03                                 |
| 19MFG_L_7_3_46    | -0.44 | 2.50E-03                                 |
| 139IPL_L_6_3_40rd | -0.43 | 2.90E-03                                 |
| 107FuG_L_3_3_37lv | -0.43 | 3.10E-03                                 |
| 4SFG_R_7_2_8dl    | -0.43 | 3.10E-03                                 |
| 55PrG_L_6_2_6cdl  | -0.43 | 3.50E-03                                 |
| 7SFG_L_7_4_6dl    | -0.41 | 5.60E-03                                 |
| 32IFG_R_6_2_IFS   | -0.41 | 5.70E-03                                 |
| 26MFG_R_7_6_6vl   | -0.40 | 5.90E-03                                 |
| 85MTG_L_4_3_37dl  | -0.40 | 6.00E-03                                 |
| 145IPL_L_6_6_40rv | -0.39 | 7.50E-03                                 |
| 97ITG_L_7_5_37vl  | -0.39 | 8.60E-03                                 |

## Positive correlations

| region ID Name       | r    | uncorrected p (surviving FDR correction) |
|----------------------|------|------------------------------------------|
| 78STG_R_6_5_38l      | 0.38 | 1.00E-02                                 |
| 233Tha_L_8_2_mPMtha  | 0.39 | 7.90E-03                                 |
| 224Str_R_6_3_NAC     | 0.40 | 5.90E-03                                 |
| 254Cb_Left_Crus_I    | 0.40 | 6.50E-03                                 |
| 70STG_R_6_1_38m      | 0.41 | 5.10E-03                                 |
| 166INS_R_6_2_vla     | 0.41 | 5.80E-03                                 |
| 255Cb_Vermis_Crus_I  | 0.42 | 4.50E-03                                 |
| 256Cb_Right_Crus_I   | 0.43 | 3.20E-03                                 |
| 268Cb_Right_VIIIb    | 0.43 | 3.30E-03                                 |
| 221Str_L_6_2_GP      | 0.43 | 3.40E-03                                 |
| 263Cb_Left_VIIIa     | 0.43 | 3.50E-03                                 |
| 265Cb_Right_VIIIa    | 0.43 | 3.60E-03                                 |
| 257Cb_Left_Crus_II   | 0.44 | 2.40E-03                                 |
| 248Cb_Right_I-IV     | 0.44 | 2.60E-03                                 |
| 182CG_R_7_4_23v      | 0.44 | 2.80E-03                                 |
| 262Cb_Right_VIIb     | 0.45 | 1.80E-03                                 |
| 241Tha_L_8_6_Otha    | 0.45 | 2.10E-03                                 |
| 259Cb_Right_Crus_II  | 0.47 | 1.00E-03                                 |
| 269Cb_Left_IX        | 0.47 | 1.10E-03                                 |
| 266Cb_Left_VIIIb     | 0.47 | 1.10E-03                                 |
| 222Str_R_6_2_GP      | 0.47 | 1.30E-03                                 |
| 261Cb_Vermis_VIIb    | 0.48 | 8.20E-04                                 |
| 267Cb_Vermis_VIIIb   | 0.48 | 8.30E-04                                 |
| 260Cb_Left_VIIb      | 0.48 | 8.70E-04                                 |
| 247Cb_Left_I-IV      | 0.48 | 9.00E-04                                 |
| 212Amyg_R_2_1_mAmyg  | 0.49 | 6.00E-04                                 |
| 251Cb_Left_VI        | 0.50 | 5.00E-04                                 |
| 264Cb_Vermis_VIIIa   | 0.50 | 5.10E-04                                 |
| 249Cb_Left_V         | 0.53 | 1.90E-04                                 |
| 252Cb_Vermis_VI      | 0.53 | 2.00E-04                                 |
| 253Cb_Right_VI       | 0.57 | 4.20E-05                                 |
| 258Cb_Vermis_Crus_II | 0.58 | 2.70E-05                                 |
| 250Cb_Right_V        | 0.60 | 1.20E-05                                 |

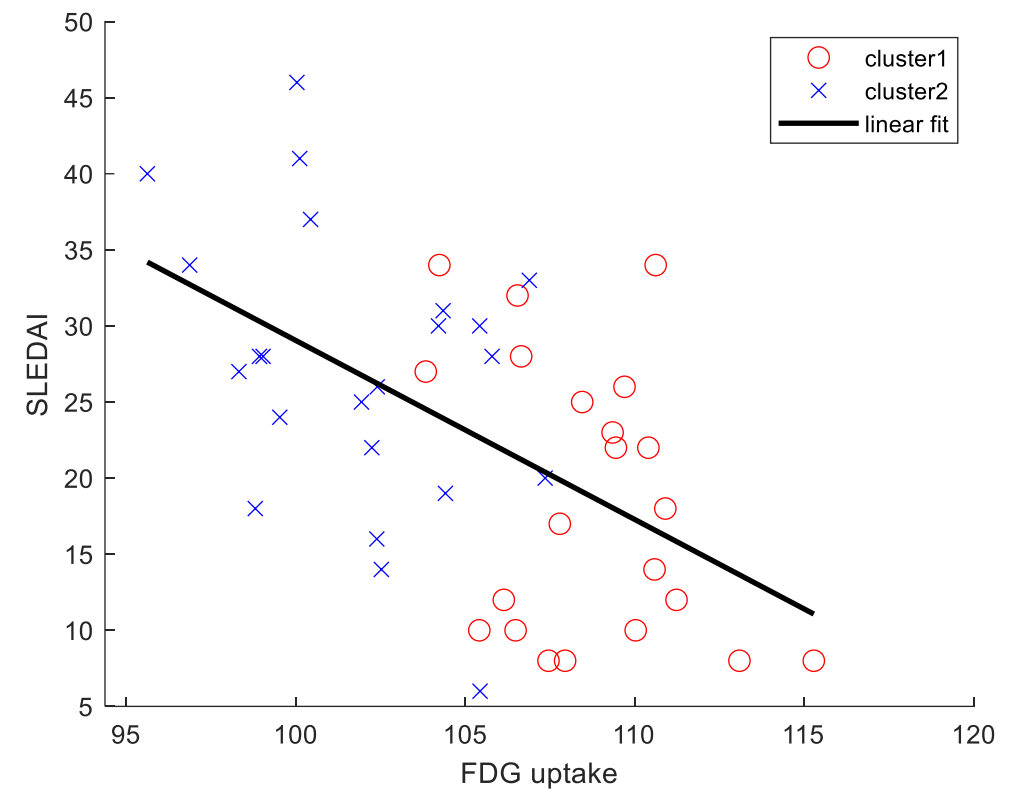
## Correlation between SLEDAI and FDG uptake in the composite VOI (all regions where FDG uptake in cluster1 > cluster2)

Estimated Coefficients:

|             | <u>Estimate</u> | <u>SE</u> | <u>tStat</u> | <u>pValue</u> |
|-------------|-----------------|-----------|--------------|---------------|
| (Intercept) | 146.7           | 29.865    | 4.9123       | 1.3485e-05    |
| x1          | -1.1766         | 0.28358   | -4.1489      | 0.00015459    |

Number of observations: 45, Error degrees of freedom: 43

- Root Mean Squared Error: 8.61
- R-squared: 0.286, Adjusted R-Squared: 0.269
- F-statistic vs. constant model: 17.2, p-value = 0.000155



# Correlation between SLEDAI and FDG uptake in the composite VOI (all regions where FDG uptake in cluster2 > cluster1)

Estimated Coefficients:

Estimated Coefficients:

|             | <u>Estimate</u> | <u>SE</u> | <u>tStat</u> | <u>pValue</u> |
|-------------|-----------------|-----------|--------------|---------------|
| (Intercept) | -42.426         | 15.346    | -2.7647      | 0.0083572     |
| x1          | 0.67248         | 0.1574    | 4.2725       | 0.00010503    |

Number of observations: 45, Error degrees of freedom: 43

Root Mean Squared Error: 8.54

R-squared: 0.298, Adjusted R-Squared: 0.282

F-statistic vs. constant model: 18.3, p-value = 0.000105

