**Manuscript Data Dictionary**

Data represented in the Figures are contained in the Manuscript\_Data.excel. When organised by nodes, the order corresponds to the use annotation files housed in the parcellation directory of the GitHub and may be called in MATLAB using *annot2classes.m*. (available in <https://github.com/MICA-MNI/micaopen>)

* Figure 1B: separate sheets hold the matrices (“HCPstyle\_GDmatrix”, “HCPstyle\_MPCmatrix”, “HCPstyle\_CSmatrix”, “HCPstyle\_affinitymatrix”) and variance explained by each eigenvector (“HCPstyle\_lambdas”).
* Figure 1C: In the sheet “HCPstyle\_nodewise”, the eigenvectors of the primary cohort are the columns “E1” and “E2” and the colour coding is provided as RGB scaled between [0:1] in “manifold\_colours\_R”, “manifold\_colours\_G”, “manifold\_colours\_B”.
* Figure 1D: wiring distance is provided as separate sheet (“HCPstyle\_WDmatrix”) and the mean wiring distance is the “mean\_wiring\_distance” column in “HCPstyle\_nodewise” sheet.
* Figure 2B: cytoarchitectural similarity is provided as separate sheet (“HCPstyle\_BBmatrix”)
* Figure 2C: externopyramidisation is the “externopyramidisation” column in “HCPstyle\_nodewise” sheet.
* Figure 3A: average expression of each cell type is provided in the “average\_expression” columns of “HCPstyle\_cellwise” sheet with the following order of regions: {'MFC', 'OFC', 'DFC', 'VFC', 'M1C', 'S1C', 'IPC', 'A1C', 'STC', 'ITC', 'V1C'}
* Figure 3B: the noncardinal axes are provided as “noncardinal\_axes” columns in the “HCPstyle\_nodewise” sheet. The r values of each cell type with the axes is presented in the “corr\_with\_noncardinal” columns, where the order aligns with the order in “noncardinal\_axes” columns in the “HCPstyle\_nodewise” sheet.
* Figure 4A-C: functional community assignment is the “yeo\_assignment” column in “HCPstyle\_nodewise” sheet and wiring distance is provided as separate sheet (“HCPstyle\_WDmatrix”).
* Figure 4D: functional connectivity matrix is provided as separate sheet (“HCPstyle\_FCmatrix”).
* Figure 4E-F: mean squared error for the predictive model is provided in the “mse\_combinations” columns in “HCPstyle\_nodewise” sheet, where order corresponds to the rows of Figure 4F.
* Figure 5B: R2 is provided for each node and frequency window in the “R2\_iEEG\_across\_Hz” columns in “HCPstyle\_nodewise” sheet.
* Figure 5C: cluster assignment for each node is the “clusters” column in “HCPstyle\_nodewise” sheet.
* Figure 5D: In the sheet “HCPstyle\_clusterwise”, we provide the coefficients of the principle component analysis in the “coeff” column and the characteristic phase slope index spectra in the “psi\_mean” columns, where the order corresponds to the frequency window. The mean and standard deviation of B weightings for the lasso model are provided in “B\_mean\_across\_lambda” and “B\_std\_across\_lambda”, where the order of columns relates to the lambda value.
* Figure 6: Thresholded phase slope index matrices are the “psi\_\*Hz\_across\_clusters” columns in the “HCPstyle\_clusterwise”, where rows and columns represent clusters. Hierarchical level assignments are the “hierarchical\_level\_\*Hz” columns in “HCPstyle\_clusterwise”.
* Supp Fig 1B: separate sheets hold the matrices (“FSstyle\_GDmatrix”, “FSstyle\_MPCmatrix”, “FSstyle\_CSmatrix”, “FSstyle\_affinitymatrix”) and variance explained by each eigenvector (“FSstyle\_lambdas”).
* Supp Fig 1C: In the sheet “FSstyle\_nodewise”, the eigenvectors of the primary cohort are the columns “E1” and “E2” and the colour coding is provided as RGB scaled between [0:1] in “manifold\_colours\_R”, “manifold\_colours\_G”, “manifold\_colours\_B”.
* Supp Fig 1D: wiring distance is provided as separate sheet (“FSstyle\_WDmatrix”) and the mean wiring distance is the “mean\_wiring\_distance” column in “FSstyle\_nodewise” sheet.
* Supp Fig 3A: the eigenvectors of the replication cohort are the columns “E1\_replication” and “E2\_replication” in the “FSstyle\_nodewise” and “HCPstyle\_nodewise” sheets.
* Supp Fig 4C-E: the inter-individual variation, average prediction across individuals and standard deviation across individuals are the columns “interindividual\_variation”, “mean\_individual\_mse” and “std\_individual\_mse” in the “FSstyle\_nodewise” and “HCPstyle\_nodewise” sheets. The functional community and level of laminar differentiation assignments are “yeo\_assignment” and “mesulam \_assignment” in the “FSstyle\_nodewise” and “HCPstyle\_nodewise” sheets
* Supp Fig 5B: cytoarchitectural similarity is provided as separate sheet (“FSstyle\_BBmatrix”)
* Supp Fig 5C: externopyramidisation is the “externopyramidisation” column in “FSstyle\_nodewise” sheet.
* Supp Fig 6A: average expression of each cell type is provided in the “average\_expression” columns of “FSstyle\_cellwise” sheet with the following order of regions: {'MFC', 'OFC', 'DFC', 'VFC', 'M1C', 'S1C', 'IPC', 'A1C', 'STC', 'ITC', 'V1C'}
* Supp Fig 6B: the noncardinal axes are provided as “noncardinal\_axes” columns in the “FSstyle\_nodewise” sheet. The r values of each cell type with the axes is presented in the “corr\_with\_noncardinal” columns, where the order aligns with the order in “noncardinal\_axes” columns in the “FSstyle\_nodewise” sheet.
* Supp Fig 4C-E: In the “FSstyle\_nodewise” and “HCPstyle\_nodewise” sheets, the group average cortical morphology measures are coded as “thickness” and “curvature”, the “parc\_centroid” is ordered [x,y,z], and unimodal gradients are the “E1\_GDonly”, ”E1\_MPConly”, “E1\_TSonly”, ”E2\_GDonly”, “E2\_MPConly, “E2\_TSonly” columns
* Supp Fig 8A-C: functional community assignment is the “yeo\_assignment” column in “FSstyle\_nodewise” sheet and wiring distance is provided as separate sheet (“FSstyle\_WDmatrix”).
* Supp Fig 8D: functional connectivity matrix is provided as separate sheet (“FSstyle\_FCmatrix”).
* Supp Fig 8E-F: mean squared error for the predictive model is provided in the “mse\_combinations” columns in “FSstyle\_nodewise” sheet, where order corresponds to the rows of Figure 4F.
* Supp Fig 9B: the hyperparameters are provided for each node as “learning\_rate” and “number\_of\_estimators” columns in the “HCPstyle\_nodewise” sheet.
* Supp Fig 10: the eigenvectors of the patient cohort are the columns “E1\_patients” and “E2\_ patients” in the “HCPstyle\_nodewise” sheet.
* Supp Fig 11B: R2 is provided for each node and frequency window in the “R2\_iEEG\_across\_Hz” columns in “FSstyle\_nodewise” sheet.
* Supp Fig 11C: cluster assignment for each node is the “clusters” column in “FSstyle\_nodewise” sheet.
* Supp Fig 11D: In the sheet “FSstyle\_clusterwise”, we provide the coefficients of the principle component analysis in the “coeff” column and the characteristic phase slope index spectra in the “psi\_mean” columns, where the order corresponds to the frequency window. The mean and standard deviation of B weightings for the lasso model are provided in “B\_mean\_across\_lambda” and “B\_std\_across\_lambda”, where the order of columns relates to the lambda value.
* Supp Fig 12A: the number of edges represented between each cluster is provided in “electrodes\_used\_across\_cluster\_pairs” columns of the “HCPstyle\_clusterwise” sheet, where rows and columns are clusters.
* Supp Fig 12C: the weighting of the pca coefficients are provided in the “pca\_coeff\_across\_loo” columns of the the “HCPstyle\_clusterwise” sheet, where columns are leave-one-out-iterations.
* Supp Fig 12D: the mean and standard deviation of psi estimates resulting from the leave-one-out-procedure are provide weighting of the pca coefficients are provided in the “mean\_psi\_loo\_\*Hz\_across\_clusters” and “std\_psi\_loo\_\*Hz\_across\_clusters” columns of the “HCPstyle\_clusterwise” sheet, where rows and columns are clusters.
* Supp Fig 13: Thresholded phase slope index matrices are the “psi\_\*Hz\_across\_clusters” columns in the “FSstyle\_clusterwise”, where rows and columns represent clusters. Hierarchical level assignments are the “hierarchical\_level\_\*Hz” columns in “FSstyle\_clusterwise”.