Network properties:

Small-worldness is defined by clustering coefficient (Cp) and shortest path length (Lp).

Cp is defined as the ratio of the number of edges between "other nodes" directly connected to node i in the network to the maximum number of possible edges between these "other nodes".

The equation is as follows: $C_i=E_i/\frac{1}{2}k_i(k_i-1)$.

E_i means the number of edges between "other nodes" directly connected to node i, and K_i means the connectivity of node i. $\frac{1}{2}k_i(k_i-1)$ is the maximum number of edges of "other nodes". Ci measures the collective degree of this node.

Lp is defined as the shortest path length of node i.

The equation is as follows: $Li=\frac{1}{N-1}*\Sigma_{i\neq j\in G}*L_{i,j.}$

L_{ij} means the shortest path between node i and node j.

Global efficiency is defined as the reciprocal average of the shortest path length between each pair of nodes in the whole brain network.

The equation is as follows: $E_{global}=1/N(N-1)*\Sigma_{i,j,i\neq j}*(1/d_{ij})$

N is the number of nodes, and d_{ij} means the distance between node i and node j.

Local efficiency is defined as the local efficiency of the whole brain network as each sub-network's global efficiency (Gi).

The equation is as follows: $E_{local}(i)= E_{global}(G_i)$.

Assortativity is used to examine whether nodes with similar values are connected.

Nodal Efficiency is defined as the global efficiency of Node i.

The equation is as follows: $Eglob\_i=(1/N-1)*\Sigma(1/Li,j)$.

L_{ij} means the shortest path between node I and node j.

Nodal Local Efficiency is defined as the local efficiency of Node i.

The equation is as follows: $E_{loc\_i}=1/N_{Gi}(N_{Gi}-1)*\Sigma_{j,k\in Gi}*(1/L_{i,j})$.

G_i is the sub-network composed of "other nodes" directly connected by node I; N_{Gi} is the total number of nodes in the subnetwork; and $L_{j,k}$ means the shortest path between nodes j and k.

Degree centrality is defined as the number of edges shared by node i with other nodes in the network.

The equation is as follows: $K_i=1/n\sum k_i$.

K_i is the centrality value of node I.

Betweenness centrality is the number of shortest paths through a particular node among all other node pairs in the network.

The equation is as follows: $N_{bc}(i)= \Sigma_{j\neq i\neq k\in G}*\frac{djk(i)}{djk}$.

δ_{jk} means the number of shortest paths between any two nodes in the connected network

except node i; $\delta_{jk}(i)$ is the number of paths passing through node i in the shortest path between any two nodes.