

## Description of Additional Supplementary Files

### **Title: Supplementary Data 1**

Description: The differential expression genes between the *HPCAL 1+* L2/3 IT and Exc *NPY* subclasses.

### **Title: Supplementary Data 2**

Description: KEGG enrichment analysis of the Exc *NPY* up-regulated differential expression genes. *P*-value for each term was determined by Fisher's exact test implemented in g:Profiler with FDR-adjust for multiple comparisons.

### **Title: Supplementary Data 3**

Description: Statistics of electrophysiological properties between *HPCAL 1+* L2/3 IT and Exc *NPY*. The significance of differences between *HPCAL 1+* L2/3 IT and Exc *NPY* was determined using two-sided Mann-Whitney test.

### **Title: Supplementary Data 4**

Description: The differential expression genes between the L4 *RORB OSTN* and IT Even subclasses.

### **Title: Supplementary Data 5**

Description: KEGG enrichment analysis of the L4 *RORB OSTN* up-regulated differential expression genes. *P*-value for each term was determined by Fisher's exact test implemented in g:Profiler with FDR-adjust for multiple comparisons.

### **Title: Supplementary Data 6**

Description: Biological Process enrichment analysis of the L4 *RORB OSTN* up-regulated differential expression genes. *P*-value for each term was determined by Fisher's exact test implemented in g:Profiler with FDR-adjust for multiple comparisons.

### **Title: Supplementary Data 7**

Description: KEGG enrichment analysis of the L4 *RORB OSTN* down-regulated differential expression genes. *P*-value for each term was determined by Fisher's exact test implemented in g:Profiler with FDR-adjust for multiple comparisons.

### **Title: Supplementary Data 8**

Description: Biological Process enrichment analysis of the L4 *RORB OSTN* down-regulated differential expression genes. *P*-value for each term was determined by Fisher's exact test implemented in g:Profiler with FDR-adjust for multiple comparisons.