# Supplementary Material

**A Preliminary Comparison of the Methylome and Transcriptome from the Prefrontal Cortex Across Alzheimer's Disease and Lewy Body Dementia**
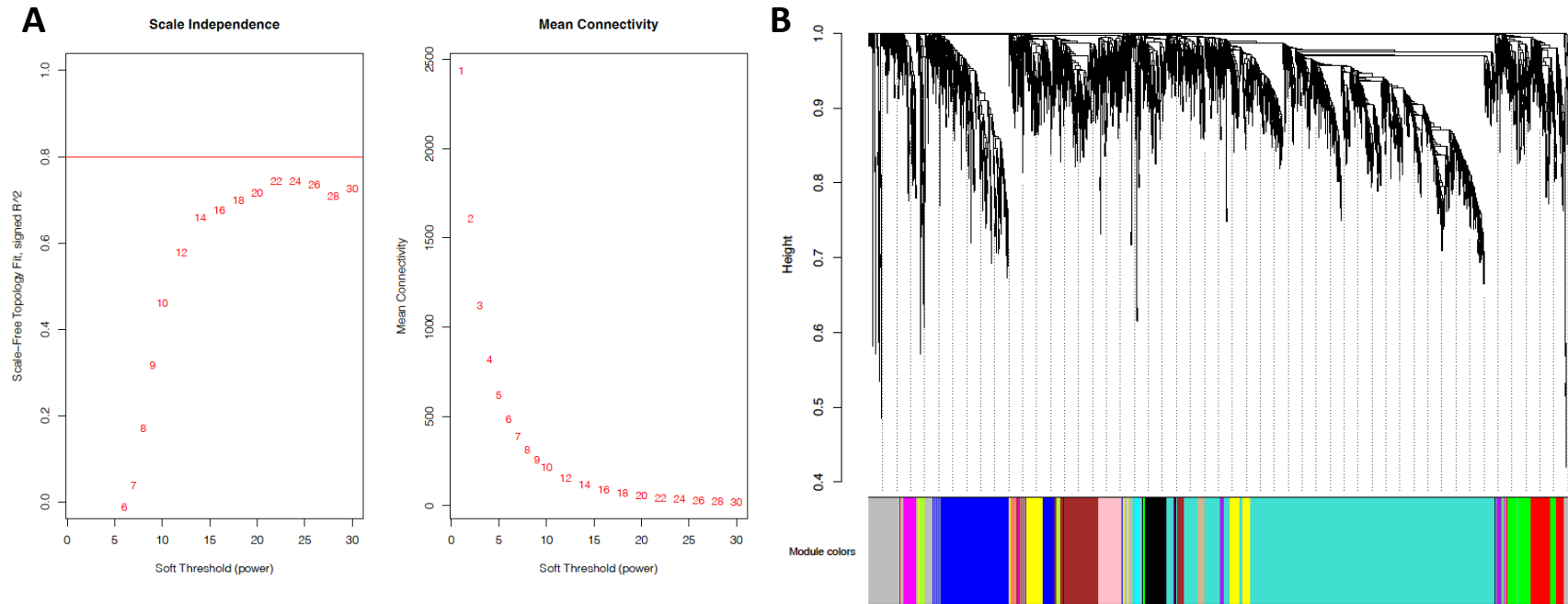
**Supplementary Table 1.** Frequency of DMP overlap between Cognitive Unimpaired Controls and dementia types

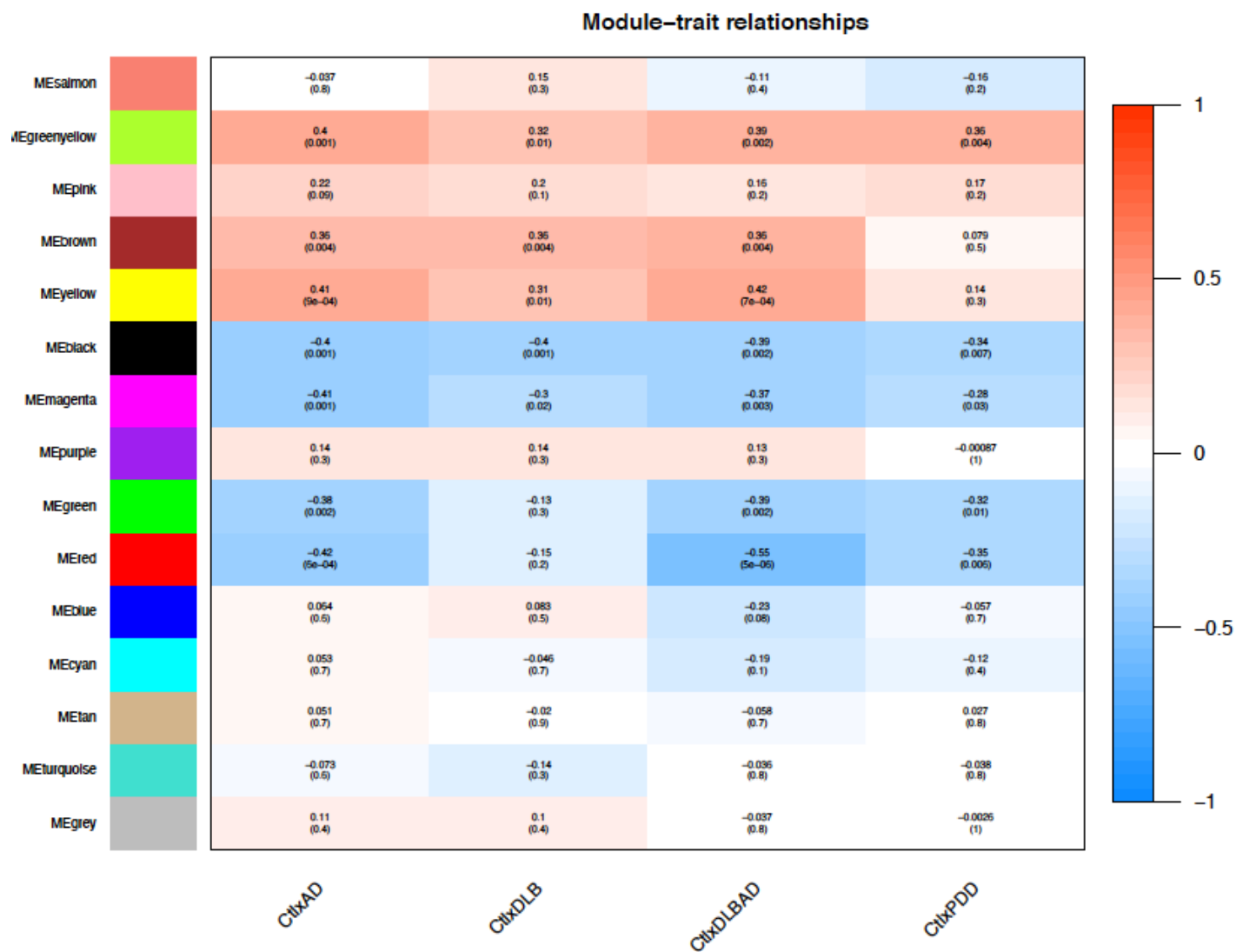| Comparison Group 1 | Total Shared (#) | Comparison Group 2 | Total DMPs | DMPs Up | DMPs Down | All Share (%) | Shared Among Dementias (%) |
|---|---|---|---|---|---|---|---|
| Control | All = 6 | AD | 168 | 88 | 80 | 3.6 | N/A |
| | | DLB | 513 | 217 | 296 | 1.2 | N/A |
| | | DLBAD | 546 | 378 | 168 | 1.1 | N/A |
| | | PDD | 1,151 | 947 | 204 | 0.5 | N/A |
| AD | All = 1, Dementia Only = 3 | Control | 168 | 80 | 88 | 0.6 | N/A |
| | | DLB | 717 | 357 | 360 | 0.1 | 0.4 |
| | | DLBAD | 626 | 439 | 187 | 0.2 | 0.5 |
| | | PDD | 674 | 558 | 116 | 0.1 | 0.4 |
| DLB | All = 5, Dementia Only = 14 | Control | 513 | 296 | 217 | 1.0 | N/A |
| | | AD | 717 | 360 | 357 | 0.7 | 2.0 |
| | | DLBAD | 877 | 577 | 300 | 0.6 | 1.6 |
| | | PDD | 5,505 | 4,225 | 1,280 | 0.1 | 0.3 |
| DLBAD | All = 1, Dementia Only = 2, | Control | 546 | 168 | 378 | 0.2 | N/A |
| | | AD | 626 | 187 | 439 | 0.2 | 0.3 |
| | | DLB | 877 | 300 | 557 | 0.1 | 0.2 |
| | | PDD | 1,908 | 1,189 | 719 | 0.1 | 0.1 |
| PDD | All = 66, Dementia Only = 114 | Control | 1,151 | 204 | 947 | 2.9 | N/A |
| | | AD | 674 | 116 | 558 | 9.8 | 16.9 |
| | | DLB | 5,505 | 1,280 | 4,225 | 1.2 | 2.1 |
| | | DLBAD | 1,908 | 719 | 1189 | 3.5 | 6.0 |

**Supplementary Table 2.** Frequency of DEG overlap between Cognitive Unimpaired Controls and dementia types

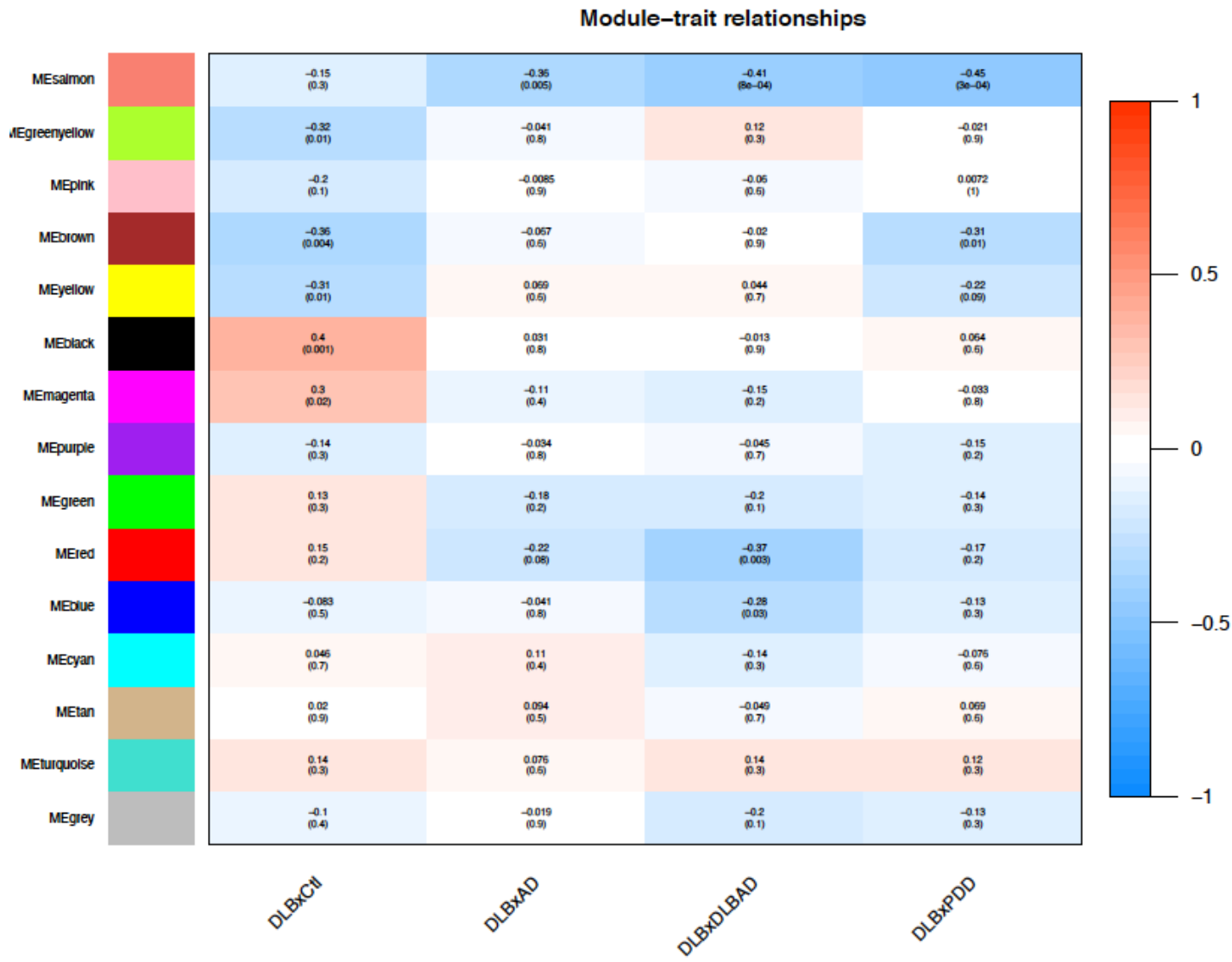| Comparison Group 1 | Total Shared (#) | Comparison Group 2 | Total DEGs | DEGs Up | DEGs Down | All Share (%) | Shared Among Dementias (%) |
|---|---|---|---|---|---|---|---|
| Control | All = 423 | AD | 3,680 | 1,791 | 1,889 | 11.5 | N/A |
| | | DLB | 2,360 | 934 | 1,427 | 17.9 | N/A |
| | | DLBAD | 4,397 | 2,122 | 2,275 | 9.6 | N/A |
| | | PDD | 1,059 | 331 | 730 | 39.9 | N/A |
| AD | All = 0, Dementia Only = 0 | Control | 3,680 | 1,889 | 1,791 | 0.0 | N/A |
| | | DLB | 97 | 43 | 54 | 0.0 | **0** |
| | | DLBAD | 88 | 34 | 54 | 0.0 | **0** |
| | | PDD | 641 | 326 | 315 | 0.0 | **0** |
| DLB | All = 2, Dementia Only = 8 | Control | 2,360 | 1,427 | 934 | 0.1 | N/A |
| | | AD | 97 | 54 | 43 | 2.1 | **8.2** |
| | | DLBAD | 432 | 246 | 186 | 0.5 | **1.9** |
| | | PDD | 541 | 286 | 255 | 0.4 | **1.5** |
| DLBAD | All = 3, Dementia Only = 5 | Control | 4,397 | 2,275 | 2,122 | 0.1 | N/A |
| | | AD | 88 | 54 | 34 | 3.4 | **5.7** |
| | | DLB | 432 | 186 | 246 | 0.7 | **1.2** |
| | | PDD | 793 | 435 | 358 | 0.4 | **0.6** |
| PDD | All = 33, Dementia Only = 219 | Control | 1,059 | 730 | 331 | 3.1 | N/A |
| | | AD | 641 | 315 | 326 | 5.1 | **34.2** |
| | | DLB | 541 | 255 | 286 | 6.1 | **40.5** |
| | | DLBAD | 793 | 358 | 435 | 4.2 | **27.6** |

**Supplementary Figure 1. WGCNA Analysis.** A) Soft-thresholding at each Beta using a signed analysis revealed optimal beta of 14. B) Dendrogram with module assignments. Grey module represents all genes with unique transcriptional patterns that did not sort into a defined transcriptional module.
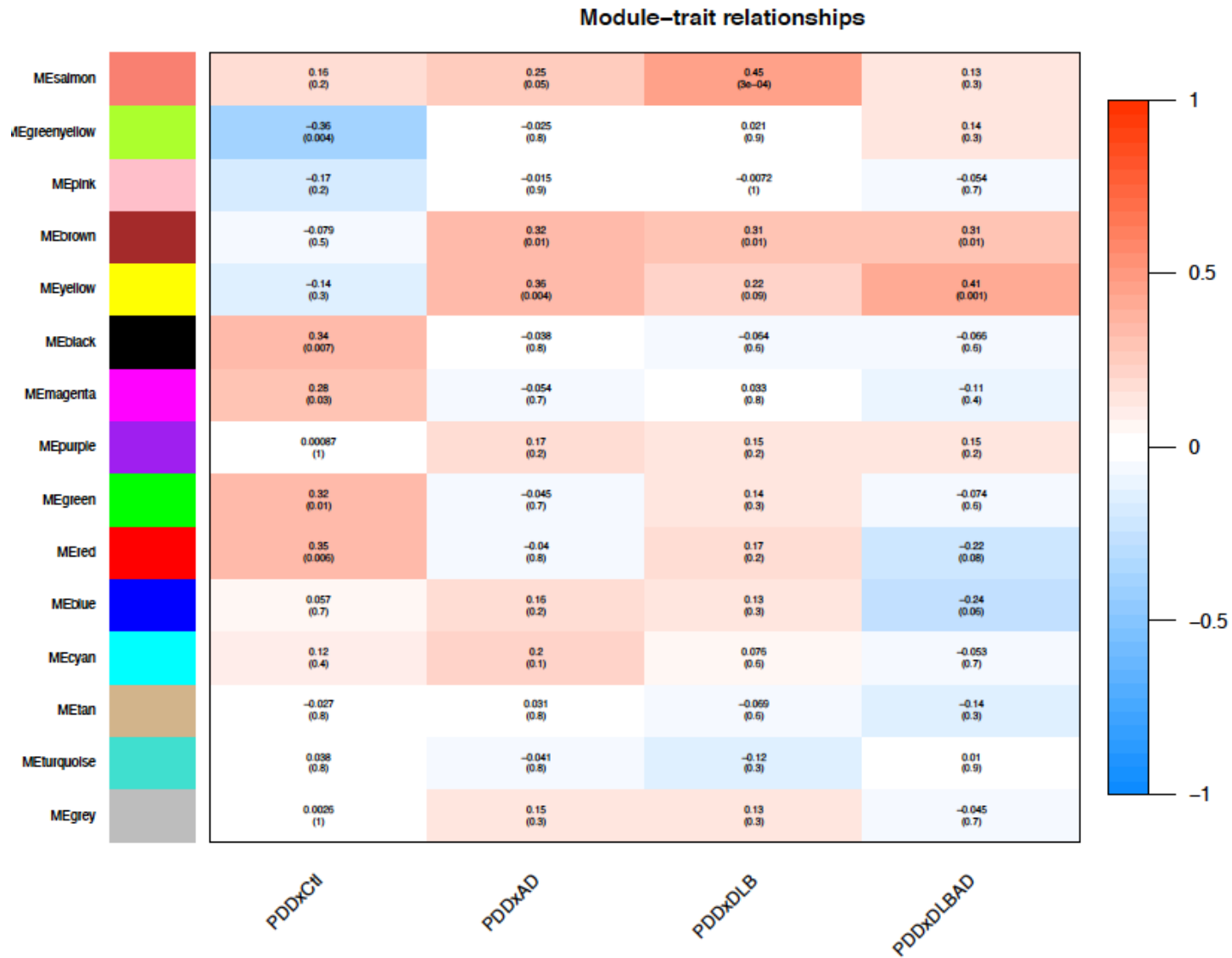
**Supplementary Figure 2. WGCNA Heatmap Control Comparisons.** Correlation of eigengenes for each module (top value) and p-value (bottom value in parenthesis) for each dementia compared to control only. Positive associations are in red and negative associations are in blue.



Module–trait relationships

**Supplementary Figure 3. WGCNA Heatmap Dementia with Lewy Bodies Comparisons.** Correlation of eigengenes for each module (top value) and p-value (bottom value in parenthesis) for DLB to all other groups only. Positive associations are in red and negative associations are in blue.

**Supplementary Figure 4. WGCNA Heatmap Parkinson's Disease Dementia Comparisons.** Correlation of eigengenes for each module (top value) and p-value (bottom value in parenthesis) for PDD to all other groups only. Positive associations are in red and negative associations are in blue.

## Supplementary Figure 5. Overlap between DMPs and WGCNA module genes

| | Con v AD | Con v DLB | Con v DLBAD | Con v PDD | PDD v AD | PDD v DLB | PDD v DLBAD | AD v DLB | DLB v DLBAD | DLBAD v AD |
|---|---|---|---|---|---|---|---|---|---|---|
| **Grey** | 1.66 | 2.05* | 1.22 | 1.01 | 2.29* | 1.01 | 1.31 | 1.70 | 2.20* | 2.13* |
| **Blue** | 1.21 | 0.67 | 0.89 | 1.12 | 0.90 | 1.11 | 0.89 | 0.99 | 1.12 | 1.23 |
| **Pink** | 0.00 | 0.95 | No Overlap | 0.56 | 1.04 | 1.13 | 1.33 | 0.33 | 0.61 | 0.39 |
| **Turquoise** | 0.42 | 0.60 | 0.62 | 0.88 | 0.47 | 1.13 | 0.75 | 0.73 | 0.61 | 0.48 |
| **Brown** | No Overlap | No Overlap | No Overlap | 0.98 | No Overlap | 0.98 | 0.85 | No Overlap | 0.14 | No Overlap |
| **Cyan** | No Overlap | No Overlap | No Overlap | No Overlap | No Overlap | 2.02 | 0.78 | No Overlap | No Overlap | No Overlap |
| **Salmon** | No Overlap | 4.69 | 2.05 | 1.33 | 5.14 | 0.82 | 1.52 | 3.28 | 1.44 | 1.89 |
| **Magenta** | No Overlap | No Overlap | 0.76 | 1.01 | 0.90 | 0.39 | 0.55 | 0.58 | 0.53 | 0.70 |
| **Green** | 3.65 | 2.50* | 3.68* | 1.18 | 2.77* | 0.50 | 1.20 | 2.04 | 2.16* | 2.93* |
| **Black** | 2.74 | 2.44 | 2.74* | 3.10* | 2.09 | 0.86 | 2.20* | 2.85* | 2.98* | 2.52* |
| **Red** | 2.47 | 1.71 | 2.01 | 0.48 | 2.42 | 0.60 | 0.83 | 1.19 | 1.09 | 1.45 |
| **Yellow** | 0.89 | 1.30 | 1.52 | 1.18 | 1.05 | 1.24 | 1.35 | 1.40 | 1.05 | 1.71 |
| **Greenyellow** | No Overlap | No Overlap | No Overlap | No Overlap | No Overlap | 1.24 | 0.34 | No Overlap | No Overlap | No Overlap |
| **Tan** | No Overlap | No Overlap | No Overlap | No Overlap | No Overlap | 0.62 | 0.56 | No Overlap | No Overlap | No Overlap |
| **Purple** | 6.18* | 3.16 | 2.90 | 1.21 | 1.08 | 0.74 | 2.16 | 2.20 | 2.02 | 1.73 |

**See Excel files for Supplementary Data.**

**Supplementary Data 1.** Differentially Methylated Probes Raw Data

**Supplementary Data 2.** Differentially Methylated Regions Raw Data

**Supplementary Data 3.** GoMeth Raw Data

**Supplementary Data 4.** Differentially Expressed Genes Raw Data

**Supplementary Data 5.** Control versus Dementia Common DEG Enrichments

**Supplementary Data 6.** PDD versus Dementia Common DEG Enrichments

**Supplementary Data 7.** Potential Hub Genes

**Supplementary Data 8.** Module Membership and Gene Significance Raw Data

**Supplementary Data 9.** Module Functional Enrichment Raw Data