**Supplementary Tables**

Table e-1: Demographics of patients included in immune-profiling (Nanostring panel)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Groups | No: | Age (Mean & Standard Deviation ) | Gender  (F/M) | BMI(Mean & Standard Deviation ) | Medication |
| AQP4+NMOSD patients with *C. bolteae* | 5 | 36  ( ± 3.6) | F-5 | 21.11 | 5- Mycophenolate Mofetil |
| AQP4+NMO patients without *C. bolteae* | 6 | 38.8  ( ± 2.4) | F-4,  M-2 | 21.09 | 3-Mycophenolate  Mofetil  3-Azathioprine |

Table e-2 Spearman Rho correlation analysis between microbiota abundance and immune gene expression in CD4+ peripheral T cells among AQP4+ NMOSD

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **AQP4+ NMOSD** | **CD70** |  | **IFI35** |  | **MAPK11** |  | **TAP2** |  | **CCR10** |  | **KLRAP1** |  | **PML** |  | **IKBKE** |  |
|  | Rho | p | Rho | p | Rho | p | Rho | p | Rho | p | Rho | p | Rho | p | Rho | p |
| ***Clostridium bolteae*** | **0.66** | **0.02** | 0.46 | 0.14 | 0.43 | 0.18 | **0.65** | **0.03** | 0.46 | 0.15 | 0.5 | 0.11 | **0.68** | **0.02** | **0.74** | **0.009** |
| ***Flavonifractor plautii*** | 0.56 | 0.07 | 0.46 | 0.16 | 0.31 | 0.35 | 0.51 | 0.11 | 0.41 | 0.21 | **0.67** | **0.02** | **0.61** | **0.04** | 0.55 | 0.07 |
| ***Phascolarctobacterium faecium*** | 0.42 | 0.2 | 0.05 | 0.88 | **0.64** | **0.03** | 0.05 | 0.88 | 0.31 | 0.35 | 0.45 | 0.18 | 0.15 | 0.65 | -0.4 | 0.22 |
| ***Bacteroides ovatus*** | 0.49 | 0.12 | -0.38 | 0.25 | **0.69** | **0.02** | -0.19 | 0.57 | 0.24 | 0.48 | 0.1 | 0.76 | -0.16 | 0.62 | -0.28 | 0.39 |
| ***Enterobacteriaceae*** | 0.14 | 0.67 | -0.35 | 0.29 | 0 | 1 | 0.03 | 0.93 | 0.13 | 0.71 | 0.35 | 0.28 | 0.16 | 0.63 | 0.47 | 0.14 |
| ***Clostridium ramosum*** | -0.32 | 0.93 | -0.25 | 0.45 | -0.19 | 0.58 | -0.08 | 0.81 | -0.39 | 0.24 | 0.09 | 0.78 | -0.12 | 0.73 | 0.11 | 0.76 |
| ***Megamonas funiformis*** | -0.2 | 0.55 | 0.16 | 0.63 | -0.47 | 0.14 | 0.23 | 0.49 | -0.18 | 0.6 | -0.07 | 0.83 | 0.2 | 0.55 | 0.06 | 0.86 |
| ***Desulfovibrionaceae*** | -0.45 | 0.17 | -0.23 | 0.49 | -0.66 | 0.03 | -0.24 | 0.48 | -0.52 | 0.09 | -0.38 | 0.25 | -0.27 | 0.43 | -0.11 | 0.74 |
| ***Prevotella*** | -0.059 | 0.86 | -0.31 | 0.36 | -0.18 | 0.58 | 0.03 | 0.89 | -0.23 | 0.49 | -0.17 | 0.62 | 0.02 | 0.94 | 0.32 | 0.34 |
| ***Bifidobacterium longum*** | 0.2 | 0.55 | 0.32 | 0.34 | 0.35 | 0.29 | -0.15 | 0.65 | 0.44 | 0.18 | 0.04 | 0.92 | -0.14 | 0.69 | -0.23 | 0.5 |
| ***Ruminococcus bromii*** | -0.29 | 0.37 | 0.39 | 0.23 | -0.24 | 0.48 | -0.02 | 0.95 | -0.11 | 0.73 | **-0.59** | **0.05** | -0.17 | 0.61 | -0.24 | 0.48 |
| **CONTROL** | **CD70** |  | **IFI35** |  | **MAPK11** |  | **TAP2** |  | **CCR10** |  | **KLRAP1** |  | **PML** |  | **IKBKE** |  |
| ***Clostridium bolteae*** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Flavonifractor plautii*** | -0.51 | 0.08 | 0.13 | 0.68 | -0.02 | 0.94 | -0.03 | 0.91 | -0.27 | 0.39 | 0.07 | 0.82 | 0.08 | 0.78 | 0 | 1 |
| ***Phascolarctobacterium faecium*** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Bacteroides ovatus*** | -0.07 | 0.81 | -0.15 | 0.65 | 0.15 | 0.65 | -0.27 | 0.4 | -0.53 | 0.07 | -0.42 | 0.17 | -0.53 | 0.07 | -0.31 | 0.32 |
| ***Enterobacteriaceae*** | **-0.63** | **0.02** | -0.22 | 0.48 | -0.02 | 0.94 | 0.29 | 0.36 | -0.13 | 0.69 | 0.1 | 0.75 | 0.2 | 0.53 | 0.007 | 0.98 |
| ***Clostridium ramosum*** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Megamonas funiformis*** | 0.26 | 0.41 | -0.01 | 0.98 | -0.13 | 0.69 | 0.15 | 0.64 | -0.09 | 0.76 | -0.21 | 0.51 | 0.02 | 0.95 | 0.12 | 0.71 |
| ***Desulfovibrionaceae*** | -0.13 | 0.68 | -0.09 | 0.77 | 0.36 | 0.25 | 0.39 | 0.21 | -0.06 | 0.85 | -0.28 | 0.38 | 0.1 | 0.75 | 0.34 | 0.27 |
| ***Prevotella*** | -0.34 | 0.27 | -0.18 | 0.56 | -0.48 | 0.11 | -0.08 | 0.81 | 0.31 | 0.33 | 0.5 | 0.09 | 0.09 | 0.76 | -0.26 | 0.41 |
| ***Bifidobacterium longum*** | **0.64** | **0.02** | 0.43 | 0.16 | 0.27 | 0.38 | 0.33 | 0.29 | 0.51 | 0.09 | 0.24 | 0.45 | 0.5 | 0.09 | 0.52 | 0.08 |
| ***Ruminococcus bromii*** | -0.09 | 0.53 | 0.03 | 0.93 | 0.28 | 0.36 | **0.63** | **0.02** | 0.16 | 0.61 | 0.26 | 0.41 | 0.56 | 0.06 | **0.6** | **0.03** |