**Supplementary Materials:**

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| **eTable 1. TCRB Gene Rearrangement Primer Sets** |
| Name | Sequence |
| VB2 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGAACTATGTTTTGGTATCGTCA |
| VB4 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGCACGATGTTCTGGTACCGTCAGCA |
| VB5/1 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGCAGTGTGTCCTGGTACCAACAG |
| VB6A/11 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGAACCCTTTATTGGTACCGACA |
| VB6B/25 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGATCCCTTTTTTGGTACCAACAG |
| VB6C R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGAACCCTTTATTGGTATCAACAG |
| VB7 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGCGCTATGTATTGGTACAAGCA |
| VB8A R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGCTCCCGTTTTCTGGTACAGACAGAC |
| VB9 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGCGCTATGTATTGGTATAAACAG |
| VB10 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGTTATGTTTACTGGTATCGTAAGAAGC |
| VB11 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGCAAAATGTACTGGTATCAACAA |
| VB12A/3/13A/15 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGATACATGTACTGGTATCGACAAGAC |
| VB13B R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGGGCCATGTACTGGTATAGACAAG |
| VB13C/12B/14 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGGTATATGTCCTGGTATCGACAAGA |
| VB16 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGTAACCTTTATTGGTATCGACGTGT |
| VB17 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGGGCCATGTACTGGTACCGACA |
| VB18 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGTCATGTTTACTGGTATCGGCAG |
| VB19 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGTTATGTTTATTGGTATCAACAGAATCA |
| VB20 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGCAACCTATACTGGTACCGACA |
| VB21 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGTACCCTTTACTGGTACCGGCAG |
| VB22 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGATACTTCTATTGGTACAGACAAATCT |
| VB23/8B R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGCACGGTCTACTGGTACCAGCA |
| VB24 R2 | GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGCGTCATGTACTGGTACCAGCA |
| BJ1.1 ex R1 | TCGTCGGCAGCGTCAGATGTGTATAAGAGACAGAAAAATGTCTTACCTACAACTG |
| BJ1.2 ex R1 | TCGTCGGCAGCGTCAGATGTGTATAAGAGACAGCCCAGCCTTACCTACAAC |
| BJ1.3 ex R1 | TCGTCGGCAGCGTCAGATGTGTATAAGAGACAGTGACTTACTCACCTACAAC |
| BJ1.4 ex R1 | TCGTCGGCAGCGTCAGATGTGTATAAGAGACAGTCTTTTACATACCCAAGAC |
| BJ1.5 ex R1 | TCGTCGGCAGCGTCAGATGTGTATAAGAGACAGTTCTGCAACTTACCTAGGAT |
| BJ1.6 ex R1 | TCGTCGGCAGCGTCAGATGTGTATAAGAGACAGGAGCCCCCATACCTGTCAC |
| BJ2.1 ex R1 | TCGTCGGCAGCGTCAGATGTGTATAAGAGACAGCCTGGAGCCCCCTTCTTAC |
| BJ2.2 ex R1 | TCGTCGGCAGCGTCAGATGTGTATAAGAGACAGCCGCCTCCTTACCCAGTAC |
| BJ2.3 ex R1 | TCGTCGGCAGCGTCAGATGTGTATAAGAGACAGAGCCCCCGCTTACCGAGCAC |
| BJ2.4 ex R1 | TCGTCGGCAGCGTCAGATGTGTATAAGAGACAGGCCCCAGCTTACCCAGCAC |
| BJ2.5 ex R1 | TCGTCGGCAGCGTCAGATGTGTATAAGAGACAGAGCCCGCGCTCACCGAGCAC |
| BJ2.6 ex R1 | TCGTCGGCAGCGTCAGATGTGTATAAGAGACAGGCGAAAACTCACCCAGCAC |
| BJ2.7 ex R1 | TCGTCGGCAGCGTCAGATGTGTATAAGAGACAGGCCCGAATCTCACCTGTGAC |

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| **eTable 2**. **List of Brain Antigens** |
| **Name** | **Acronym** | **Reference** |
| 14-3-3 protein beta/alpha | YWHAB | Matute-Blanch Handbook of Clinical Neurology 2018 |
| 14-3-3 epsilon | YWHAE | Matute-Blanch Handbook of Clinical Neurology 2018 |
| abCrystallin | CRYAB | From: Human Protein Atlas-Brain-enriched Genes (https://www.proteinatlas.org) |
| AIF-1 | AIF-1 | Jarius et al., 2016 |
| Aquaporin-4 | AQP4 | Dahm et al. 2014  |
| Contactin-associated protein-like 2 | Caspr2 | Hohlfeld et al., 2016 |
| Cell Adhesion Molecule 2 | CADM2 | Dahm et al. 2014  |
| Chitinase-3-like protein 1/YKL40 | CHI3L1/YKL40 | Matute-Blanch Handbook of Clinical Neurology 2018 |
| Collapsing response mediator protein 5 | CRMP5 | Hohlfeld et al., 2016 |
| Connexin29/Gap Junction Protein Gamma 3 | CX29/GJC3 | Hecker et al., 2016 |
| Connexin30/Gap Junction Protein Beta 6 | CX30/GJB6 | Jarius et al., 2016 |
| Connexin32/Gap Junction Protein Beta 1 | CX32/GJb1 | Abrams and Scherer, 2012 |
| Connexin43/Gap Junction Protein Alpha 1 | CX43/GJA1 | Abrams and Scherer, 2012 |
| Connexin47/Gap Junction Protein Gamma 2 | CX47/GJC2 | Abrams and Scherer, 2012 |
| Dipeptidyl Peptidase 6  | DPP6 | Abrams and Scherer, 2012 |
| EBNA1 binding protein 2 | EBNA1BP2 | Abrams and Scherer, 2012 |
| Embryonic Lethal Abnormal Visual Protein2 | ELAVL2 | Jarius et al., 2016 |
| Embryonic Lethal Abnormal Visual Protein3 | ELAVL3 | Yeste and Quitana, 2013 |
| Excitatory Amino Acid Transporter 2 | EAAT2 | Hohlfeld et al., 2016 |
| Glutamate Decarboxylase 1/Glutamate decarboxylase 67kDa | GAD1/GAD67 | Dahm et al. 2014  |
| Galactocerebroside | Galactocerebroside | Fraussen et al., 2014 |
| Glyceraldehyde 3-phosphate dehydrogenase | GAPDH | Somers et al.,2009 |
| Glial fibrillary acidic protein | GFAP | Matute-Blanch Handbook of Clinical Neurology 2018 |
| Glutamate dehydrogenase 2 | GLUD2 | Dahm et al. 2014  |
| Glutamate receptor, ionotropic, N-methyl D-aspartate 1 | GRIN1 | Matute-Blanch Handbook of Clinical Neurology 2018 |
| Glutamate Ionotropic Receptor AMPA Type Subunit 2 | GRIA2 | Jarius et al., 2016 |
| Glutamate Metabotropic Receptor 1 | GRM1 | Dahm et al. 2014  |
| Glucose-regulated protein 78kDA | GRP78 | Shimizu et al., 2017 |
| Heat shock 60kDa protein 1 (chaperonin) | HSPD1 | Jarius et al., 2016 |
| Homolog 3 (Drosophila) (HOMER3) | HOMER3 | Hohlfeld et al., 2016 |
| Inositol 1,4,5-Trisphosphate Receptor Type 1 | ITPR1 | Dahm et al. 2014  |
| Kappa Light Chains  | Kappa Light Chains  | Jarius et al., 2016 |
| Potassium Inwardly-rectifying Channel Subfamily J Member 10 | KCNJ10 | From: Human Protein Atlas-Brain-enriched Genes (https://www.proteinatlas.org) |
| Leucine-rich glioma inactivated-2 | LGI2 | Matute-Blanch Handbook of Clinical Neurology 2018 |
| Metabotropic glutamate receptor 1 | mGlu1 | Jarius et al., 2016 |
| Metabotropic glutamate receptor 2 | mGluR2 | Dahm et al. 2014  |
| Metabotropic glutamate receptor 3 | mGluR3 | Weissert, 2018 |
| Metabotropic glutamate receptor 5 | mGluR5 | Kobeissy and Moshourab, 2015 |
| Microtubule associated protein 2 | MAP2 | Jarius et al., 2016 |
| Myelin associated glycoprotein | MAG | Weissert, 2018 |
| Myelin-associated oligodendrocyte basic protein | MOBP | Matute-Blanch Handbook of Clinical Neurology 2018 |
| Myelin proteolipid protein | PLP1 | Willis et al., 2015 |
| Neural cell adhesion molecule-1/CD56 | NCAM-1/CD56 | Matute-Blanch Handbook of Clinical Neurology 2018 and Hohlfeld et al., 2016 |
| Neurofascin | NFASC | Fraussen et al., 2014 |
| Neurofilament, light polypeptide | NfL | Dahm et al. 2014  |
| neuron-glial antigen 2/Chondroitin sulfate proteoglycan 4 | NG2/CSPG4 | From: Human Protein Atlas-Brain-enriched Genes (https://www.proteinatlas.org) |
| Reticulon 4 Receptor | RTN4R | Fraussen et al., 2014 |
| NOVA Alternative Splicing Regulator 2 | NOVA2 | From: Human Protein Atlas-Brain-enriched Genes (https://www.proteinatlas.org) |
| Oligodendrocyte Transcription Factor 2 | OLIG2 | Jarius et al., 2016 |
| Oligodendrocyte specific protein | OSP | Weissert, 2018 |
| Orphan glutamate receptor delta2  | GluD2 | Hohlfeld et al., 2016 and Querol et al., 2013 |
| Protocadherin Alpha 1 | PCDHA1 | From: Human Protein Atlas-Brain-enriched Genes (https://www.proteinatlas.org) |
| PNMA Family Member 2 | PNMA2 | Dahm et al. 2014  |
| Protein kinase C, gamma | PRKCG | Fraussen et al., 2014 |
| Receptor Accessory Protein 2 | REEP2 | Matute-Blanch Handbook of Clinical Neurology 2018 and Weissert, 2018 |
| Recombination Signal Binding Protein For Immunoglobulin kappa J Region | RBPJ | From: Human Protein Atlas-Brain-enriched Genes (https://www.proteinatlas.org) |
| S100 calcium binding protein B | S100B | From: Human Protein Atlas-Brain-enriched Genes (https://www.proteinatlas.org) |
| Solute Carrier Family 17 | SLC17A6 | Fraussen et al., 2014 |
| Sperm associated antigen 16 | SPAG16 | From: Human Protein Atlas-Brain-enriched Genes (https://www.proteinatlas.org) |
| Synapsin I, transcript variant Ia | SYN1 | From: Human Protein Atlas-Brain-enriched Genes (https://www.proteinatlas.org) |
| Synaptophysin | SYP  | Fraussen et al., 2014 |
| Transaldolase | TALDO1 | Dahm et al. 2014 |

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| **eTable 3**. **IgM and IgG antibody score averages and significance for all brain antigens** |
|  |  | **Average Antibody Score** |
| **CSF IgM** | **CSF IgG** |
| **ID** | **Abr ID** | **HC** | **AD** | **p-val** | **HC** | **AD** | **p-val** |
| 14-3-3 protein beta/alpha | YWHAB | 1.81 | 1.93 | 0.79 | 3.90 | 3.22 | 0.65 |
| 14-3-3 epsilon | YWHAE | 1.75 | 2.30 | 0.49 | 5.43 | 5.02 | 1.00 |
| abCrystallin | CRYAB | 1.49 | 0.85 | 0.57 | 1.71 | 0.35 | 0.15 |
| AIF-1 | AIF-1 | 1.68 | 1.98 | 0.79 | 4.64 | 4.05 | 0.96 |
| Aquaporin-4 | AQP4 | 2.83 | 5.00 | 0.34 | 9.74 | 9.02 | 0.29 |
| Contactin-associated protein-like 2 | Caspr2 | 6.76 | 6.99 | 0.60 | 12.64 | 12.51 | 0.72 |
| Cell Adhesion Molecule 2 | CADM2 | 2.34 | 3.40 | 0.53 | 5.93 | 6.27 | 0.33 |
| Chitinase-3-like protein 1/YKL40 | CHI3L1/YKL40 | 5.94 | 6.27 | 0.66 | 8.37 | 8.09 | 1.00 |
| Collapsing response mediator protein 5 | CRMP5 | 0.71 | 1.90 | 0.56 | 3.02 | 2.01 | 0.31 |
| Connexin29/Gap Junction Protein Gamma 3 | CX29/GJC3 | 2.71 | 4.36 | 0.25 | 4.18 | 5.45 | 0.10 |
| Connexin30/Gap Junction Protein Beta 6 | CX30/GJB6 | 6.69 | 7.15 | 1.00 | 2.60 | 3.38 | 0.49 |
| Connexin32/Gap Junction Protein Beta 1 | CX32/GJb1 | 7.10 | 6.86 | 0.54 | 10.77 | 10.35 | 0.93 |
| Connexin43/Gap Junction Protein Alpha 1 | CX43/GJA1 | 8.95 | 8.60 | 0.93 | 9.57 | 9.49 | 0.86 |
| Connexin47/Gap Junction Protein Gamma 2 | CX47/GJC2 | 2.42 | 3.20 | 0.22 | 7.90 | 8.80 | 0.96 |
| Dipeptidyl Peptidase 6 | DPP6 | 1.01 | 1.59 | 0.76 | 5.04 | 5.13 | 0.72 |
| EBNA1 binding protein 2 | EBNA1BP2 | 0.38 | 0.88 | 0.46 | 2.30 | 1.83 | 0.85 |
| Embryonic Lethal Abnormal Visual Protein2 | ELAVL2 | 17.10 | 15.63 | 0.86 | 7.89 | 7.47 | 0.79 |
| Embryonic Lethal Abnormal Visual Protein3 | ELAVL3 | 7.70 | 9.00 | 0.29 | 14.68 | 16.50 | 0.13 |
| Excitatory Amino Acid Transporter 2 | EAAT2 | 0.00 | 2.21 | 0.12 | 3.73 | 5.60 | 0.28 |
| Glutamate Decarboxylase 1/Glutamate decarboxylase 67kDa | GAD1/GAD67 | 9.96 | 9.13 | 0.93 | 9.97 | 8.82 | 0.86 |
| Galactocerebroside | Galactocerebroside | 0.54 | 2.81 | 0.25 | 6.14 | 5.66 | 0.93 |
| Glyceraldehyde 3-phosphate dehydrogenase | GAPDH | 0.65 | 0.21 | 0.74 | 3.39 | 1.66 | 0.06 |
| Glial fibrillary acidic protein | GFAP | 0.25 | 0.25 | 1.00 | 0.46 | 0.07 | 0.10 |
| Glutamate dehydrogenase 2 | GLUD2 | 0.76 | 0.96 | 0.85 | 0.97 | 1.10 | 0.45 |
| Glutamate receptor, ionotropic, N-methyl D-aspartate 1 | GRIN1 | 0.07 | 0.55 | 0.79 | 1.16 | 1.44 | 0.74 |
| Glutamate Ionotropic Receptor AMPA Type Subunit 2 | GRIA2 | 0.00 | 1.19 | 0.09 | 5.64 | 6.39 | 0.68 |
| Glutamate Metabotropic Receptor 1 | GRM1 | 1.79 | 2.66 | 0.34 | 7.36 | 7.26 | 1.00 |
| Glucose-regulated protein 78kDA | GRP78 | 1.70 | 2.97 | 0.26 | 5.89 | 6.79 | 0.54 |
| Heat shock 60kDa protein 1 (chaperonin) | HSPD1 | 9.57 | 9.97 | 0.59 | 7.13 | 8.26 | 0.79 |
| Homolog 3 (Drosophila) (HOMER3) | HOMER3 | 1.17 | 1.26 | 0.84 | 1.95 | 1.45 | 1.00 |
| Inositol 1,4,5-Trisphosphate Receptor Type 1 | ITPR1 | 1.65 | 3.68 | 0.08 | 6.10 | 5.37 | 1.00 |
| Kappa Light Chains | Light Chains | 2.39 | 3.06 | 0.41 | 0.00 | 0.00 | NA |
| Potassium Inwardly Rectifying Channel Subfamily J Member 10 | KCNJ10 | 2.89 | 2.95 | 0.85 | 7.18 | 6.07 | 0.29 |
| Leucine-rich glioma inactivated-2 | LGI2 | 4.34 | 4.36 | 0.86 | 7.17 | 6.37 | 0.43 |
| Metabotropic glutamate receptor 1 | mGlu1 | 3.19 | 5.15 | 0.41 | 7.98 | 7.41 | 0.72 |
| Metabotropic glutamate receptor 2 | mGluR2 | 5.92 | 5.73 | 0.37 | 12.20 | 11.42 | 0.60 |
| Metabotropic glutamate receptor 3 | mGluR3 | 5.65 | 6.19 | 0.72 | 7.06 | 7.38 | 0.79 |
| Metabotropic glutamate receptor 5 | mGluR5 | 3.64 | 5.13 | 0.22 | 11.92 | 10.84 | 0.43 |
| Microtubule associated protein 2 | MAP2 | 6.63 | 6.94 | 0.72 | 6.46 | 5.86 | 0.60 |
| Myelin associated glycoprotein | MAG | 0.38 | 0.89 | 0.40 | 0.59 | 0.22 | 0.41 |
| Myelin-associated oligodendrocyte basic protein | MOBP | 2.65 | 1.84 | 0.47 | 3.13 | 1.54 | 0.41 |
| Myelin proteolipid protein | PLP1 | 2.20 | 2.18 | 0.84 | 5.63 | 4.28 | 0.49 |
| Neural cell adhesion molecule-1/CD56 | NCAM-1/CD56 | 2.06 | 2.89 | 0.71 | 10.81 | 10.12 | 0.54 |
| Neurofascin | NFASC | 12.66 | 12.46 | 0.72 | 7.09 | 6.97 | 0.37 |
| Neurofilament, light polypeptide | NfL | 0.87 | 2.24 | 0.14 | 2.50 | 1.85 | 0.78 |
| neuron-glial antigen 2/Chondroitin sulfate proteoglycan 4 | NG2/CSPG4 | 5.28 | 6.32 | 0.86 | 8.99 | 8.57 | 0.72 |
| Reticulon 4 Receptor | RTN4R | 0.00 | 1.59 | 0.13 | 4.84 | 8.29 | 0.69 |
| NOVA Alternative Splicing Regulator 2 | NOVA2 | 0.87 | 2.17 | 0.12 | 3.62 | 3.70 | 0.58 |
| Oligodendrocyte Transcription Factor 2 | OLIG2 | 3.94 | 4.58 | 0.50 | 7.19 | 7.50 | 0.66 |
| Oligodendrocyte specific protein | OSP | 1.15 | 1.85 | 0.40 | 4.11 | 3.44 | 0.86 |
| Orphan glutamate receptor delta2 | GluD2 | 0.00 | 0.17 | 0.49 | 1.76 | 0.78 | 0.30 |
| Protocadherin Alpha 1 | PCDHA1 | 3.14 | 4.51 | 0.33 | 6.27 | 6.06 | 0.79 |
| PNMA Family Member 2 | PNMA2 | 0.00 | 0.79 | 0.62 | 4.70 | 3.77 | 0.66 |
| Protein kinase C, gamma | PRKCG | 3.96 | 3.25 | 0.37 | 2.14 | 1.76 | 0.40 |
| Receptor Accessory Protein 2 | REEP2 | 1.75 | 2.19 | 0.78 | 2.64 | 1.95 | 0.52 |
| Recombination Signal Binding Protein For Immunoglobulin kappa J Region | RBPJ | 16.94 | 13.68 | 0.86 | 10.88 | 10.98 | 0.93 |
| S100 calcium binding protein B | S100B | 1.09 | 1.46 | 0.51 | 3.59 | 3.14 | 0.33 |
| Solute Carrier Family 17 | SLC17A6 | 1.88 | 4.20 | 0.08 | 1.01 | 1.35 | 0.89 |
| Sperm associated antigen 16 | SPAG16 | 1.85 | 2.72 | 0.18 | 3.70 | 3.93 | 0.26 |
| Synapsin I, transcript variant Ia | SYN1 | 0.00 | 1.14 | 0.25 | 2.71 | 3.76 | 0.46 |
| Synaptophysin | SYP | 4.34 | 6.72 | 0.96 | 11.01 | 10.72 | 0.37 |
| Transaldolase | TALDO1 | 2.50 | 3.97 | 0.51 | 4.88 | 5.60 | 0.34 |
| Zic Family Member 4 | ZIC4 | 0.38 | 1.48 | 0.08 | 2.33 | 3.77 | 0.17 |