# Additional File

**Identification of novel cerebrospinal fluid biomarker candidates for dementia with Lewy bodies: a proteomic approach**

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**Supplementary Table 1.** Differentially expressed proteins in cohort 1 based on mass spectrometry data analysis

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Uniprot Accession** | **Gene name** | **Protein name** | **Sequence coverage (%)** | **Fold change** | **p-value** | **q-value** | **# DLB samples** | **# Control samples** |
| **O15240** | **VGF** | **Neurosecretory protein VGF** | **63.4** | **-1.777** | **1.62E-06** | **0.003** | **20** | **20** |
| **P13521** | **SCG2** | **Secretogranin-2** | **52.2** | **-1.357** | **8.96E-05** | **0.089** | **20** | **20** |
| **P47972** | **NPTX2** | **Neuronal pentraxin-2** | **43.9** | **-1.548** | **0.001** | **0.498** | **20** | **20** |
| **P05060** | **CHGB** | **Secretogranin-1** | **71.5** | **-1.265** | **0.001** | **0.524** | **20** | **20** |
| CON\_\_ENSEMBL:ENSBTAP00000006074 | | | 16.7 | -1.618 | 0.001 | 0,524 | 0 | 1 |
| P60842 | EIF4A | Eukaryotic initiation factor 4A | 20 | 0,089 | 0.002 | 0.559 | 0 | 1 |
| **P19021;** | **PAM** | **Peptidyl-glycine alpha-amidating monooxygenase** | **56.2** | 0,498 | **0.003** | **0.789** | **20** | **20** |
| **P01213** | **PDYN** | **Proenkephalin-B** | **42.9** | 0,524 | **0.004** | **0.954** | **16** | **20** |
| **O95502** | **NPTXR** | **Neuronal pentraxin receptor** | **67** | **-1.305** | **0.005** | **0.984** | **20** | **20** |
| **P13760** | **HLA-DRB1** | **HLA class II histocompatibility antigen. DRB1-4 beta chain** | **44** | **10.047** | **0.005** | **0.984** | **14** | **5** |
| **P29279-** | **CTGF** | **Connective tissue growth factor** | **31.7** | **-1.229** | **0.006** | **0.985** | **20** | **20** |
| P04440 | HLA-DPB1 | HLA class II histocompatibility antigen. DP beta 1 chain | 29.1 | -1.864 | 0.006 | 0.985 | 0 | 1 |
| Q9UKZ9 | PCOLCE2 | Procollagen C-endopeptidase enhancer 2 | 6.5 | 1.795 | 0.007 | 0.985 | 1 | 0 |
| **Q15063** | **POSTN** | **Periostin** | **45.8** | **-4.435** | **0.008** | **0.985** | **10** | **17** |
| **P49747** | **COMP** | **Cartilage oligomeric matrix protein** | **53.8** | **-1.337** | **0.009** | **0.985** | **20** | **20** |
| P55001 | MFAP2 | Microfibrillar-associated protein 2 | 12.4 | -3.262 | 0.009 | 0.985 | 0 | 5 |
| **Q9BXJ3** | **C1QTNF4** | **Complement C1q tumor necrosis factor-related protein 4** | **57.8** | **-1.260** | **0.010** | **0.985** | **20** | **20** |
| Q9BQ51 | PDCD1LG2 | Programmed cell death 1 ligand 2 | 12.6 | -1.516 | 0.011 | 0.985 | 0 | 1 |
| Q504Y2 | PKDCC | Extracellular tyrosine-protein kinase PKDCC | 17.4 | 1.959 | 0.011 | 0.985 | 2 | 0 |
| **Q8WXD2** | **SCG3** | **Secretogranin-3** | **74.4** | **-1.204** | **0.013** | **0.985** | **20** | **20** |
| **Q5VSG8** | **MANEAL** | **Glycoprotein endo-alpha-1.2-mannosidase-like protein** | **51.4** | **-3.448** | **0.014** | **0.985** | **15** | **20** |
| A6NL88 | SHISA7 | Protein shisa-7 | 7.4 | -3.020 | 0.016 | 0.985 | 16 | 20 |
| **P02452** | **COL1A1** | **Collagen alpha-1(I) chain** | **26.1** | **-1.226** | **0.019** | **0.985** | **20** | **20** |
| Q9ULH4 | LRFN2 | Leucine-rich repeat and fibronectin type-III domain-containing protein 2 | 16 | -3.229 | 0.020 | 0.985 | 2 | 9 |
| P30456 | HLA-A | HLA class I histocompatibility antigen. A-43 alpha chain | 54 | 1.453 | 0.020 | 0.985 | 1 | 0 |
| Q68DQ2 | CRYBG3 | Very large A-kinase anchor protein | 1.6 | -1.557 | 0.021 | 0.985 | 0 | 1 |
| Q16610 | ECM1 | Extracellular matrix protein 1 | 75.7 | -1.158 | 0.022 | 0.985 | 20 | 20 |
| **P15509** | **CSF2RA** | **Granulocyte-macrophage colony-stimulating factor receptor subunit alpha** | **36.9** | **3.247** | **0.022** | **0.985** | **19** | **13** |
| P06703 | S100A6 | Protein S100-A6 | 16.7 | 2.985 | 0.022 | 0.985 | 4 | 0 |
| Q6PCB0 | VWA1 | von Willebrand factor A domain-containing protein 1 | 41.1 | -3.837 | 0.024 | 0.985 | 4 | 10 |
| **P04275;** | **VWF** | **von Willebrand factor;von Willebrand antigen 2** | **48.2** | **-1.244** | **0.024** | **0.985** | **20** | **20** |
| Q16849 | PTPRN | Receptor-type tyrosine-protein phosphatase-like N | 19.6 | -2.408 | 0.024 | 0.985 | 18 | 20 |
| Q6JBY9 | RCSD1 | CapZ-interacting protein | 9.4 | 1.352 | 0.025 | 0.985 | 0 | 1 |
| Q4ZIN3 | TMEM259 | Membralin | 3.4 | -1.644 | 0.025 | 0.985 | 0 | 1 |
| **P01031** | **C5** | **Complement C5** | **63.4** | **1.339** | **0.028** | **0.985** | **20** | **20** |
| P05783 | KRT18 | Keratin, type I cytoskeletal 18 | 24.9 | 1.781 | 0.028 | 0.985 | 1 | 0 |

**Supplementary Table 1.** Differentially expressed proteins in cohort 1 based on mass spectrometry data analysis (continued)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Uniprot Accession** | **Gene name** | **Protein name** | **Sequence coverage (%)** | **Fold change** | **p-value** | **q-value** | **# DLB samples** | **# Control samples** |
| **Q15768** | **EFNB3** | **Ephrin-B3** | **36.5** | **-1.211** | **0.028** | **0.985** | **20** | **20** |
| **P01859** | **IGHG2** | **Ig gamma-2 chain C region** | **36.2** | **-4.036** | **0.029** | **0.985** | **8** | **15** |
| **Q14DG7** | **TMEM132B** | **Transmembrane protein 132B** | **20.2** | **-3.279** | **0.029** | **0.985** | **13** | **18** |
| **P61812** | **TGFB2** | **Transforming growth factor beta-2** | **27.8** | **3.995** | **0.031** | **0.985** | **13** | **7** |
| **P08123** | **COL1A2** | **Collagen alpha-2(I) chain** | **25.5** | **-1.213** | **0.032** | **0.985** | **20** | **20** |
| **P16519** | **PCSK2** | **Neuroendocrine convertase 2** | **28.9** | **-1.833** | **0.032** | **0.985** | **19** | **20** |
| Q9NY56 | OBP2A | Odorant-binding protein 2a | 35.9 | 3.300 | 0.033 | 0.985 | 4 | 0 |
| **Q06141** | **REG3A** | **Regenerating islet-derived protein 3-alpha** | **41.7** | **3.528** | **0.033** | **0.985** | **18** | **12** |
| **Q9Y2E5** | **MAN2B2** | **Epididymis-specific alpha-mannosidase** | **42.8** | **1.330** | **0.034** | **0.985** | **20** | **20** |
| **P07478** | **PRSS2** | **Trypsin-2** | **12.1** | **-7.192** | **0.034** | **0.985** | **13** | **18** |
| **Q9NY33** | **DPP3** | **Dipeptidyl peptidase 3** | **40.8** | **-2.795** | **0.035** | **0.985** | **14** | **18** |
| **Q63HQ2** | **EGFLAM** | **Pikachurin** | **38.4** | **3.074** | **0.035** | **0.985** | **20** | **17** |
| P55087 | AQP4 | Aquaporin-4 | 15.3 | 2.274 | 0.035 | 0.985 | 4 | 0 |
| **Q15493** | **RGN** | **Regucalcin** | **53.2** | **-2.640** | **0.036** | **0.985** | **15** | **20** |
| **P52565** | **ARHGDIA** | **Rho GDP-dissociation inhibitor 1** | **22.5** | **-3.752** | **0.039** | **0.985** | **5** | **11** |
| **Q9UBX7** | **KLK11** | **Kallikrein-11** | **47.6** | **-1.244** | **0.039** | **0.985** | **20** | **20** |
| **Q9NTU7** | **CBLN4** | **Cerebellin-4** | **37.3** | **-1.377** | **0.040** | **0.985** | **20** | **20** |
| **Q9UHG2** | **PCSK1N** | **ProSAAS** | **68.5** | **-1.224** | **0.040** | **0.985** | **20** | **20** |
| Q8IXA5 | SPACA3 | Sperm acrosome membrane-associated protein 3 | 7.5 | 1.471 | 0.042 | 0.985 | 1 | 0 |
| P62837 | UBE2D2 | Ubiquitin-conjugating enzyme E2 D2 | 14.3 | 5.977 | 0.042 | 0.985 | 11 | 5 |
| **Q9BUD6** | **SPON2** | **Spondin-2** | **36.3** | **-2.514** | **0.042** | **0.985** | **17** | **20** |
| **O14793** | **MSTN** | **Growth/differentiation factor 8** | **44.5** | **-1.205** | **0.044** | **0.985** | **20** | **20** |
| Q9NS68 | TNFRSF19 | Tumor necrosis factor receptor superfamily member 19 | 8.9 | 2.217 | 0.044 | 0.985 | 4 | 1 |
| **Q9Y6C2** | **EMILIN1** | **EMILIN-1** | **20.4** | **2.575** | **0.045** | **0.985** | **17** | **12** |
| Q4LDE5 | SVEP1 | Sushi. von Willebrand factor type A. EGF and pentraxin domain-containing protein 1 | 9.5 | -2.750 | 0.045 | 0.985 | 8 | 14 |
| **Q6UY11** | **DLK2** | **Protein delta homolog 2** | **22.2** | **-2.187** | **0.045** | **0.985** | **17** | **20** |
| Q30134 | HLA-DRB1 | HLA class II histocompatibility antigen. DRB1-8 beta chain | 33.5 | 1.430 | 0.046 | 0.985 | 1 | 0 |
| **Q9UKM7** | **MAN1B1** | **Endoplasmic reticulum mannosyl-oligosaccharide 1.2-alpha-mannosidase** | **33.8** | **-1.250** | **0.048** | **0.985** | **20** | **20** |
| **Q92932** | **PTPRN2** | **Receptor-type tyrosine-protein phosphatase N2** | **21.5** | **-1.230** | **0.048** | **0.985** | **20** | **20** |
| O60486 | PLXNC1 | Plexin-C1 | 7.1 | -1.369 | 0.048 | 0.985 | 0 | 1 |
| P35613 | BSG | Basigin | 39.2 | 1.558 | 0.048 | 0.985 | 1 | 0 |
| **O94856** | **NFAS** | **Neurofascin** | **51.1** | **3.576** | **0.049** | **0.985** | **14** | **9** |
| **P02788** | **LTF** | **Lactotransferrin** | **66.5** | **5.211** | **0.049** | **0.985** | **18** | **13** |

*List of 69 differentially expressed proteins in CSF from patients with DLB compared to CSF from cognitively normal controls (p<0.05)*

*Proteins in bold (n=44) also fulfilled the predefined criteria for candidate biomarkers (p<0.05, fold change >1.2, >20% sequence coverage, detected in at least 50% of DLB patients or controls).*

**Supplementary Table 2.** Differentially expressed proteins in cohort 2 based on mass spectrometry data analysis

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Uniprot Accession** | **Gene name** | **Protein name** | **Sequence coverage (%)** | **Fold change** | **p-value** | **q-value** | **# DLB samples** | **# control samples** |
| **P05413** | **FABP3** | **Fatty acid-binding protein, heart** | **75.9** | **1.494** | **0.001** | **0.895** | **17** | **13** |
| **P09936** | **UCHL1** | **Ubiquitin carboxyl-terminal hydrolase isozyme L1** | **60.1** | **16.897** | **0.001** | **0.895** | **15** | **5** |
| **P13489** | **RNH1** | **Ribonuclease inhibitor** | **30.4** | **7.337** | **0.002** | **0.895** | **11** | **2** |
| **P63104** | **YWHAZ** | **14-3-3 protein zeta/delta** | **62.9** | **1.422** | **0.003** | **0.895** | **17** | **13** |
| **P62258** | **YWHAE** | **14-3-3 protein epsilon** | **79.2** | **1.309** | **0.003** | **0.895** | **17** | **13** |
| **P18669** | **PGAM1** | **Phosphoglycerate mutase 1** | **57.1** | **1.212** | **0.004** | **0.895** | **17** | **13** |
| **P52565** | **ARHGDIA** | **Rho GDP-dissociation inhibitor 1** | **22.5** | **4.740** | **0.005** | **0.895** | **17** | **8** |
| **P35080** | **PFN2** | **Profilin-2** | **37.9** | **1.253** | **0.005** | **0.895** | **17** | **13** |
| **P31946** | **YWHAB** | **14-3-3 protein beta/alpha** | **53.7** | **1.276** | **0.005** | **0.895** | **17** | **13** |
| **O43396** | **TXNL1** | **Thioredoxin-like protein 1** | **23.5** | **6.869** | **0.005** | **0.895** | **12** | **3** |
| **P00338** | **LDHA** | **L-lactate dehydrogenase A chain** | **62** | **1.297** | **0.006** | **0.895** | **17** | **13** |
| **Q9H008** | **LHPP** | **Phospholysine phosphohistidine inorganic pyrophosphate phosphatase** | **34.8** | **4.668** | **0.007** | **0.895** | **17** | **9** |
| **O95502** | **NPTXR** | **Neuronal pentraxin receptor** | **67** | **-1.321** | **0.008** | **0.895** | **17** | **13** |
| **Q9Y6R7** | **FCGBP** | **IgGFc-binding protein** | **50.6** | **1.523** | **0.008** | **0.895** | **17** | **13** |
| **Q9H7C9** | **AAMDC** | **Mth938 domain-containing protein** | **53.3** | **6.141** | **0.010** | **0.895** | **9** | **1** |
| **Q9H4F8** | **SMOC1** | **SPARC-related modular calcium-binding protein 1** | **35.3** | **1.406** | **0.010** | **0.895** | **17** | **13** |
| Q99969 | RARRES2 | Retinoic acid receptor responder protein 2 | 74.2 | 1.189 | 0.011 | 0.895 | 17 | 13 |
| Q13591 | SEMA5A | Semaphorin-5A | 7.9 | -1.715 | 0.011 | 0.895 | 0 | 1 |
| **O15240** | **VGF** | **Neurosecretory protein VGF** | **63.4** | **-1.413** | **0.012** | **0.895** | **17** | **13** |
| P09493 | TPM1 | Tropomyosin alpha-1 chain | 25.7 | 1.726 | 0.012 | 0.895 | 1 | 0 |
| **P61981** | **YWHAG** | **14-3-3 protein gamma** | **58.3** | **4.816** | **0.012** | **0.895** | **17** | **10** |
| Q9UBW5 | BIN2 | Bridging integrator 2 | 3.2 | -1.851 | 0.013 | 0.895 | 0 | 1 |
| Q9HD45 | TM9SF3 | Transmembrane 9 superfamily member 3 | 14.1 | 4.770 | 0.013 | 0.895 | 5 | 0 |
| **P29622** | **SERPINA4** | **Kallistatin** | **65.1** | **1.300** | **0.013** | **0.895** | **17** | **13** |
| **P47972** | **NPTX2** | **Neuronal pentraxin-2** | **43.9** | **-1.503** | **0.014** | **0.895** | **17** | **13** |
| **P17936** | **IGFBP3** | **Insulin-like growth factor-binding protein 3** | **44.7** | **1.317** | **0.016** | **0.895** | **17** | **13** |
| **P13521** | **SCG2** | **Secretogranin-2** | **52.2** | **-1.304** | **0.017** | **0.895** | **17** | **13** |
| Q16787 | LAMA3 | Laminin subunit alpha-3 | 3.6 | 1.503 | 0.017 | 0.895 | 1 | 0 |
| **P02647** | **APOA1** | **Apolipoprotein A-I** | **78.3** | **1.581** | **0.017** | **0.895** | **17** | **13** |
| **P01011** | **SERPINA3** | **Alpha-1-antichymotrypsin** | **81.1** | **1.251** | **0.019** | **0.895** | **17** | **13** |
| **P01213** | **PDYN** | **Proenkephalin-B** | **42.9** | **-8.781** | **0.019** | **0.895** | **4** | **8** |
| **P14174** | **MIF** | **Macrophage migration inhibitory factor** | **20.9** | **1.268** | **0.019** | **0.895** | **17** | **13** |
| P07195 | LDHB | L-lactate dehydrogenase B chain | 56.6 | 1.171 | 0.020 | 0.895 | 17 | 13 |
| Q15459 | SF3A1 | Splicing factor 3A subunit 1 | 8.1 | 6.508 | 0.020 | 0.895 | 13 | 5 |
| **P02763** | **ORM1** | **Alpha-1-acid glycoprotein 1** | **41.3** | **5.683** | **0.022** | **0.895** | **16** | **9** |
| **P16152** | **CBR1** | **Carbonyl reductase [NADPH] 1** | **75.1** | **1.262** | **0.022** | **0.895** | **17** | **13** |

**Supplementary Table 2.** Differentially expressed proteins in cohort 2 based on mass spectrometry data analysis (continued)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Uniprot Accession** | **Gene name** | **Protein name** | **Sequence coverage (%)** | **Fold change** | **p-value** | **q-value** | **# DLB samples** | **# control samples** |
| **P12955** | **PEPD** | **Xaa-Pro dipeptidase** | **45** | **1.301** | **0.022** | **0.895** | **17** | **13** |
| **P50453** | **SERPINB9** | **Serpin B9** | **53.7** | **-5.718** | **0.023** | **0.895** | **7** | **11** |
| P51665 | PSMD7 | 26S proteasome non-ATPase regulatory subunit 7 | 7.4 | 1.515 | 0.023 | 0.895 | 1 | 0 |
| Q99832 | CCT7 | T-complex protein 1 subunit eta | 8.6 | 1.588 | 0.023 | 0.895 | 1 | 0 |
| Q16539 | MAPK14 | Mitogen-activated protein kinase 14 | 5.1 | -1.729 | 0.024 | 0.895 | 0 | 1 |
| P0C7U0 | ELFN1 | Protein ELFN1 | 4.6 | -1.978 | 0.024 | 0.895 | 0 | 1 |
| Q15818 | NPTX1 | Neuronal pentraxin-1 | 56.9 | -1.193 | 0.024 | 0.895 | 17 | 13 |
| **Q01469** | **FABP5** | **Fatty acid-binding protein, epidermal** | **80.7** | **1.239** | **0.024** | **0.895** | **17** | **13** |
| **P0C6S8** | **LINGO3** | **Leucine-rich repeat and immunoglobulin-like domain-containing nogo receptor-interacting protein 3** | **20.4** | **-3.082** | **0.025** | **0.895** | **12** | **13** |
| P10644 | PRKAR1A | cAMP-dependent protein kinase type I-alpha regulatory subunit | 36.5 | 2.061 | 0.026 | 0.895 | 1 | 0 |
| Q9HC38 | GLOD4 | Glyoxalase domain-containing protein 4 | 52.7 | 1.185 | 0.026 | 0.895 | 17 | 13 |
| **Q15262** | **PTPRK** | **Receptor-type tyrosine-protein phosphatase kappa** | **16.9** | **-1.207** | **0.026** | **0.895** | **17** | **13** |
| **Q7Z7M8** | **B3GNT8** | **UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 8** | **26.7** | **4.703** | **0.028** | **0.895** | **12** | **4** |
| P10646 | TFPI | Tissue factor pathway inhibitor | 17.1 | 2.023 | 0.028 | 0.895 | 2 | 0 |
| **O15540** | **FABP7** | **Fatty acid-binding protein, brain** | **68.9** | **2.687** | **0.028** | **0.895** | **17** | **11** |
| **P30508** | **HLA-C** | **HLA class I histocompatibility antigen, Cw-12 alpha chain** | **59** | **-6.500** | **0.028** | **0.895** | **4** | **8** |
| **P01009** | **SERPINA1** | **Alpha-1-antitrypsin;Short peptide from AAT** | **72** | **2.543** | **0.029** | **0.895** | **17** | **13** |
| **Q9UHG2** | **PCSK1N** | **ProSAAS** | **68.5** | **-1.208** | **0.029** | **0.895** | **17** | **13** |
| P61278 | SST | Somatostatin | 20.7 | -2.235 | 0.029 | 0.895 | 2 | 5 |
| **Q14520** | **HABP2** | **Hyaluronan-binding protein 2** | **46.3** | **1.316** | **0.030** | **0.895** | **17** | **13** |
| **P59665** | **DEFA1** | **Neutrophil defensin 1** | **28.7** | **4.850** | **0.030** | **0.895** | **17** | **10** |
| **P02787** | **TF** | **Serotransferrin** | **83.4** | **1.799** | **0.030** | **0.895** | **17** | **13** |
| **P62937** | **PPIA** | **Peptidyl-prolyl cis-trans isomerase A** | **70.9** | **1.240** | **0.031** | **0.895** | **17** | **13** |
| Q01151 | CD83 | CD83 antigen | 4.9 | 1.590 | 0.031 | 0.895 | 1 | 0 |
| **P00558** | **PGK1** | **Phosphoglycerate kinase 1** | **77.5** | **1.256** | **0.033** | **0.895** | **17** | **13** |
| A0A0C4DH73 | IGKV1-12 | Immunoglobulin kappa variable 1-12 | 13.7 | -1.603 | 0.033 | 0.895 | 0 | 1 |
| P0DP25 | CALM3 | Calmodulin-3 | 61.1 | 1.186 | 0.033 | 0.895 | 17 | 13 |
| **Q8WY21** | **SORCS1** | **VPS10 domain-containing receptor SorCS1** | **38.1** | **-1.273** | **0.034** | **0.895** | **17** | **13** |
| **Q7Z7G0** | **ABI3BP** | **Target of Nesh-SH3** | **22.2** | **1.233** | **0.035** | **0.895** | **17** | **13** |
| CON\_\_Q3MHN5 | |  | 19,2 | -1.465 | 0.035 | 0,895 | 0 | 1 |
| **P01008** | **SERPINC1** | **Antithrombin-III** | **71.8** | **1.239** | **0.035** | **0.895** | **17** | **13** |
| Q96GD0 | PDXP | Pyridoxal phosphate phosphatase | 28.7 | 3.596 | 0.037 | 0.895 | 8 | 2 |
| Q4LDE5 | SVEP1 | Sushi, von Willebrand factor type A, EGF and pentraxin domain-containing protein 1 | 9.5 | 3.207 | 0.037 | 0.895 | 11 | 4 |
| **P36980** | **CFHR2** | **Complement factor H-related protein 2** | **68.3** | **1.517** | **0.037** | **0.895** | **17** | **13** |
| P13497 | BMP1 | Bone morphogenetic protein 1 | 9.3 | 3.890 | 0.038 | 0.895 | 15 | 7 |
| **P01042** | **KNG1** | **Kininogen-1** | **67.9** | **1.463** | **0.039** | **0.895** | **17** | **13** |

**Supplementary Table 2.** Differentially expressed proteins in cohort 2 based on mass spectrometry data analysis (continued)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Uniprot Accession** | **Gene name** | **Protein name** | **Sequence coverage (%)** | **Fold change** | **p-value** | **q-value** | **# DLB samples** | **# control samples** |
| **Q9BZ76** | **CNTNAP3** | **Contactin-associated protein-like 3** | **30.4** | **-3.497** | **0.041** | **0.895** | **9** | **11** |
| **Q08554** | **DSC1** | **Desmocollin-1** | **24.6** | **2.691** | **0.042** | **0.895** | **17** | **11** |
| **P0C0L5** | **C4B** | **Complement C4-B** | **80** | **1.219** | **0.044** | **0.895** | **17** | **13** |
| **P06744** | **GPI** | **Glucose-6-phosphate isomerase** | **44.4** | **1.250** | **0.044** | **0.895** | **17** | **13** |
| Q6ZN30 | BNC2 | Zinc finger protein basonuclin-2 | 4.3 | -21.430 | 0.044 | 0.895 | 7 | 10 |
| **P00568** | **AK1** | **Adenylate kinase isoenzyme 1** | **59.8** | **3.112** | **0.044** | **0.895** | **17** | **10** |
| **Q16853** | **AOC3** | **Membrane primary amine oxidase** | **19.8** | **-3.288** | **0.045** | **0.895** | **9** | **11** |
| **Q9UIW2** | **PLXNA1** | **Plexin-A1** | **19.5** | **-2.576** | **0.045** | **0.895** | **14** | **13** |
| Q5BIV9 | SPRN | Shadow of prion protein | 22.5 | 3.455 | 0.045 | 0.895 | 6 | 1 |
| **Q14563** | **SEMA3A** | **Semaphorin-3A** | **27.8** | **-3.326** | **0.045** | **0.895** | **9** | **11** |
| **P27348** | **YWHAQ** | **14-3-3 protein theta** | **43.7** | **3.297** | **0.045** | **0.895** | **14** | **7** |
| Q16473 | TNXA | Putative tenascin-XA | 62.4 | -1.597 | 0.046 | 0.895 | 0 | 1 |
| Q9ULB1 | NRXN1 | Neurexin-1 | 48.5 | -1.171 | 0.046 | 0.895 | 17 | 13 |
| **P31150** | **GDI1** | **Rab GDP dissociation inhibitor alpha** | **69.4** | **1.205** | **0.046** | **0.895** | **17** | **13** |
| Q9NZL9 | MAT2B | Methionine adenosyltransferase 2 subunit beta | 17.4 | 2.582 | 0.047 | 0.895 | 3 | 0 |
| Q9HDC9 | APMAP | Adipocyte plasma membrane-associated protein | 28.4 | 2.333 | 0.047 | 0.895 | 3 | 0 |
| **Q9GZQ8** | **MAP1LC3B** | **Microtubule-associated proteins 1A/1B light chain 3B** | **27.2** | **6.112** | **0.048** | **0.895** | **12** | **5** |
| P04899 | GNAI2 | Guanine nucleotide-binding protein G(i) subunit alpha-2 | 10.4 | -1.871 | 0.049 | 0.895 | 0 | 1 |
| P07307 | ASGR2 | Asialoglycoprotein receptor 2 | 33.8 | -1.695 | 0.049 | 0.895 | 0 | 1 |
| **P49862** | **KLK7** | **Kallikrein-7** | **50.2** | **-4.699** | **0.049** | **0.895** | **10** | **12** |
| P35612 | ADD2 | Beta-adducin | 6.1 | 1.375 | 0.050 | 0.895 | 1 | 0 |

*List of 93 differentially expressed proteins in CSF from patients with DLB compared to CSF from cognitively normal controls (p<0.05)*

*Proteins in bold (n=60) also fulfilled the predefined criteria for candidate biomarkers (p<0.05, fold change >1.2, >20% sequence coverage, detected in at least 50% of DLB patients or controls).*

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**Supplementary Figure 1.** K-means cluster plot of identified clusters*Cluster solution was plotted against the first two dimensions The symbols represent the clinical diagnosis (circle = DLB; triangle = Control; plus = FTD, cross = PD, diamond = AD). The colors represent the four different clusters. Abbreviations: AD, Alzheimer’s disease; DLB, dementia with Lewy bodies; FTD, Frontotemporal dementia; PD, Parkinson’s disease.*

**Supplementary Table 3.** Comprehensive overview of CSF studies of the identified candidate biomarkers for DLB

|  |  |  |  |
| --- | --- | --- | --- |
| **Neurosceretory protein VGF (VGF)** | | | |
| **Study** | **Method** | **Participants** | **Results** |
| Brinkmalm (2018) [1] | Targeted Mass Spectrometry (PRM-MS) | 10 AD patients 13 healthy controls | VGF ↓ in AD vs controls |
| Carrette (2003) [2] | Quantitative Mass Spectrometry | 9 AD 10 healthy controls | VGF ↓ in AD vs controls |
| Duits (2018) [3] | Targeted Mass Spectrometry (PRM-MS) | 40 AD 40 MCI 40 non-demented controls | VGF ↓ in AD vs controls  VGF ↑ in MCI vs AD |
| Hendrikson (2015) [4] | Targeted Mass Spectrometry (SRM) | 30 AD 30 controls | VGF ↓ in AD vs controls |
| Holtta (2015) [5] | Quantitative Mass Spectrometry | 8 AD 8 non-demented controls | VGF ↓ in AD vs controls |
| Jahn (2011) [6] | Quantitative Mass Spectrometry | 34 AD 17 controls | VGF ↓ in AD vs controls |
| Llano (2017) [7] | Targeted Mass Spectrometry (MRM) | 66 AD 135 MCI 86 normal aged controls | VGF ↓ in AD vs controls |
| Selle (2005) [8] | Quantitative Mass Spectrometry | 127 AD 86 non-demented controls 66 non-AD demented patients | VGF ↓ in AD vs controls |
| Simonsen (2007) [9] | Quantitative Mass Spectrometry | 85 AD 20 FTD 32 healthy controls | VGF ↓ in AD vs controls |
| Wijte (2012) [10] | Quantitative Mass Spectrometry | 20 AD 20 non-demented controls  NB. Postmortem CSF | VGF ↓ in AD vs controls |
| Ruetschi (2012) [11] | Quantitative Mass Spectrometry | 16 FTD 12 non-demented controls | VGF26-62 ↓ in FTD vs controls |
| Pasinetti (2006) [12] | Quantitative Mass Spectrometry | 36 ALS 21 healthy controls | VGF398-411 ↓ in ALS vs controls |
| Zhao (2008) [13] | ELISA | 17 ALS 21 healthy controls | VGF398-411 ↓ in ALS vs controls |
| Huang (2006) [14] | Quantitative Mass Spectrometry | 41 Schizophrenia 40 healthy controls | VGF23-62 ↑ in schizophrenia vs controls |

**Supplementary Table 3.** Comprehensive overview of CSF studies of the identified candidate biomarkers for DLB (continued)

|  |  |  |  |
| --- | --- | --- | --- |
| **Secretogranin-2 (SCG2)** | | | |
| **Study** | **Method** | **Participants** | **Results** |
| Brinkmalm (2018) [1] | Targeted Mass Spectrometry (PRM-MS) | 10 AD patients 13 healthy controls | SCG2 ↓ in AD vs controls |
| Llano (2017) [7] | Targeted Mass Spectrometry (MRM) | 66 AD 86 normal aged controls | SCG2 ↓ in AD vs controls |
| Mattsson (2007) [15] | Quantitative Mass Spectrometry | 46 MS  46 healthy siblings 50 healthy controls | SCG2 ↓ in MS vs siblings and controls |
| **ProSAAS (PCSK1N)** | | | |
| **Study** | **Method** | **Participants** | **Results** |
| Abdi (2006) [16] | Quantitative Mass Spectrometry | 10 AD 10 PD 5 DLB  10 normal aged controls | ProSAAS ↓ in AD vs controls No significant changes in DLB and PD |
| Jahn (2011) [6] | Quantitative Mass Spectrometry | 34 AD 17 controls | ProSAAS ↓ in AD vs controls |
| Wang (2016) [17] | Quantitative Mass Spectrometry | 8 AD 4 non-demented controls | ProSAAS ↓ in AD vs controls |
| Davidsson (2002) [18] | Quantitative Mass Spectrometry | 15 FTD 12 non-demented controls | ProSAAS ↓ in FTD vs controls |
| **Neuronal pentraxin-2 (NPTX2) and Neuronal pentraxin receptor (NPTXR)** | | | |
| **Study** | **Method** | **Participants** | **Results** |
| Hendrikson (2015) [4] | Targeted Mass Spectrometry (SRM) | 30 AD 30 controls | NPTXR ↓ in AD vs controls |
| Llano (2017) [7] | Targeted Mass Spectrometry (MRM) | 66 AD 135 MCI 86 normal aged controls | NPTX2 and NPTXR ↓ in AD vs controls  NPTX2 and NPTXR ↓ in MCI converters vs non-converters |
| Perrin (2011) [19] | Quantitative Mass Spectrometry | 24 AD 24 non-demented controls | NPTXR ↓ in AD vs controls |
| Spellman (2015) [20] | Targeted Mass Spectrometry (MRM) | 66 AD 134 MCI 85 healthy controls | NPTX2 and NPTXR ↓ in AD vs controls |
| Xiao (2017) [21] | ELISA and Westernblot | 30 AD 36 healthy controls | NPTX2 and NPTXR ↓ in AD vs controls |

**Supplementary Table 3.** Comprehensive overview of CSF studies of the identified candidate biomarkers for DLB (continued)

|  |  |  |  |
| --- | --- | --- | --- |
| **Proenkephalin-B (PDYN)** | | | |
| **Study** | **Method** | **Participants** | **Results** |
| Llano (2017) [7] | Targeted Mass Spectrometry (MRM) | 66 AD  135 MCI 86 normal aged controls | PDYN ↓ in AD vs controls |

*Table lists CSF studies of the six identified candidate biomarkers for DLB in neurological and psychiatric diseases.****Abbreviations****: AD, Alzheimer’s disease; ALS, Amyotrophic lateral sclerosis; DLB, dementia with Lewy bodies; FTD, Frontotemporal dementia; MRM, Multiple reaction monitoring; MS, Multiple sclerosis; NPTX2, Neuronal pentraxin 2; NPTXR, Neuronal pentraxin receptor, PCSK1N, PRM-MS, Parallel Reaction Monitoring Mass Spectrometry; ProSAAS; PDYN, Proenkephalin-B; SCG2, Scretogranin-2 ;SRM, Selected Reaction Monitoring; VGF, Neurosecretory protein VGF.*

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