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**Supplementary Table 1. List of genes involved in Parkinson’s disease and other diseases related to parkinsonism included in the four incremented gene panels used in this study**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Gene** | **Loci or related diseases** | **NM\_transcripts** | **Recessive\_only** | **All\_V.1** | **All\_V.2** | **All\_V.3** |
| **Recessive PD-associated genes** |  |  |  |  |  |
| *PRKN* | PARK2 | NM\_004562.2 | *PRKN* | *PRKN* | *PRKN* | *PRKN* |
| *PINK1* | PARK6 | NM\_032409.2 | *PINK1* | *PINK1* | *PINK1* | *PINK1* |
| *DJ-1* | PARK7 | NM\_007262.4 | *PARK7* | *PARK7* | *PARK7* | *PARK7* |
| *ATP13A2* | PARK9/SPG78 | NM\_022089.2 | *ATP13A2* | *ATP13A2* | *ATP13A2* | *ATP13A2* |
| *PLA2G6* | PARK14/NBIA2B | NM\_003560.2 | *PLA2G6* | *PLA2G6* | *PLA2G6* | *PLA2G6* |
| *FBXO7* | PARK15 | NM\_012179.3 | *FBXO7* | *FBXO7* | *FBXO7* | *FBXO7* |
| *DNAJC6* | PARK19 | NM\_001256864.1 | *DNAJC6* | *DNAJC6* | *DNAJC6* | *DNAJC6* |
| *SYNJ1* | PARK20 | NM\_003895.3 | *SYNJ1* | *SYNJ1* | *SYNJ1* | *SYNJ1* |
| *VPS13C* | PARK23 | NM\_020821.2 | *VPS13C* | *VPS13C* | *VPS13C* | *VPS13C* |
| *ADORA1* | PARK | NM\_000674.2 |  |  | *ADORA1* | *ADORA1* |
|  |  |  |  |  |  |  |
| **Dominant PD-associated genes** |  |  |  |  |  |
| *SNCA* | PARK1 | NM\_000345.3 |  | *SNCA* | *SNCA* | *SNCA* |
| *LRRK2* | PARK8 | NM\_198578.3 |  | *LRRK2* | *LRRK2* | *LRRK2* |
| *VPS35* | PARK17 | NM\_018206.5 |  | *VPS35* | *VPS35* | *VPS35* |
| *UCHL1* | PARK5/SPG79 | NM\_004181.4 |  | *UCHL1* | *UCHL1* | *UCHL1* |
| *EIF4G1* | PARK18 | NM\_182917.4 |  | *EIF4G1* | *EIF4G1* | *EIF4G1* |
| *TMEM230* | PARK21 | NM\_001009923.1 |  |  | *TMEM230* | *TMEM230* |
| *DNAJC13* | PARK21 | NM\_001329126.1 |  | *DNAJC13* | *DNAJC13* | *DNAJC13* |
| *CHCHD2* | PARK22 | NM\_001320327.1 |  |  | *CHCHD2* | *CHCHD2* |
| *TNK2* | PARK | NM\_001010938.1 |  |  | *TNK2* | *TNK2* |
| *TNR* | PARK | NM\_003285.2 |  |  | *TNR* | *TNR* |
| *RIC3* | PARK | NM\_024557.4 |  |  | *RIC3* | *RIC3* |
| *PODXL* | PARK | NM\_001018111.2 |  |  | *PODXL* | *PODXL* |
| *LRP10* | PARK | NM\_014045.3 |  |  |  | *LRP10* |
|  |  |  |  |  |  |  |
| **Related Parkinsonism-associated genes** |  |  |  |  |  |
| *SPG11* | PARK/SPG11 | NM\_025137.3 |  | *SPG11* | *SPG11* | *SPG11* |
| *GCH1* | PARK\_DYT | NM\_001024024.1 |  | *GCH1* | *GCH1* | *GCH1* |
| *TH* | PARK\_DYT | NM\_199292.2 |  | *TH* | *TH* | *TH* |
| *THAP1* | DYT | NM\_018105.2 |  |  |  | *THAP1* |
| *POLG* | PARK/Mitochondrial diseases | NM\_002693.2 |  | *POLG* | *POLG* | *POLG* |
| *DCTN1* | PARK/Perry syndrome | NM\_004082.4 |  | *DCTN1* | *DCTN1* | *DCTN1* |
| *PANK2* | PARK/NBIA1 | NM\_153638.2 |  | *PANK2* | *PANK2* | *PANK2* |
| *RAB39B* | PARK/X-linked ID | NM\_171998.3 |  |  | *RAB39B* | *RAB39B* |
| *MAPT* | DFT/PSP | NM\_001123066.3 |  |  |  | *MAPT* |
| *TARDBP* | DFT | NM\_007375.3 |  |  |  | *TARDBP* |
| *VCP* | DFT | NM\_007126.3 |  |  |  | *VCP* |
| *GRN* | DFT | NM\_002087.2 |  |  |  | *GRN* |
| *PSEN1* | AD/DFT | NM\_000021.4 |  |  |  | *PSEN1* |
| *PSEN2* | AD | NM\_000447.3 |  |  |  | *PSEN2* |
|  |  |  |  |  |  |  |
| **Risk factor for PD** |  |  |  |  |  |
| *GBA* | Candidate gene | NM\_001005741.2 |  | *GBA* | *GBA* | *GBA* |
| *ACMSD* | GWAS | NM\_138326.2 |  |  |  | *ACMSD* |
| *RAB29/NUCKS1* | GWAS | rs823118 |  |  |  rs823118 |  rs823118 |
| *SIPA1L2* | GWAS | rs10797576 |  |  | rs10797576 | rs10797576 |
| *TMEM163* | GWAS | rs6430538 |  |  | rs6430538 | rs6430538 |
| *STK39* | GWAS | rs1474055 |  |  | rs1474055 | rs1474055 |
| *MCCC1* | GWAS | rs12637471 |  |  | rs12637471 | rs12637471 |
| *TMEM175* | GWAS | rs34311866 |  |  | rs34311866 | rs34311866 |
| *FAM200B* | GWAS | rs11724635 |  |  | rs11724635 | rs11724635 |
| *FAM47E* | GWAS | rs6812193g |  |  | rs6812193 | rs6812193 |
| *SNCA* | GWAS | rs356182 |  |  | rs356182 | rs356182 |
| *HLA-DRB6* | GWAS | rs9275326 |  |  | rs9275326 | rs9275326 |
| *KLHL7* | GWAS | rs199347 |  |  | rs199347 | rs199347 |
| *BAG3* | GWAS | rs117896735 |  |  | rs117896735 | rs117896735 |
| *MIR4697* | GWAS | rs329648 |  |  | rs329648 | rs329648 |
| *LRRK2* | GWAS | rs76904798 |  |  | rs76904798 | rs76904798 |
| *OGFOD2* | GWAS | rs11060180 |  |  | rs11060180 | rs11060180 |
| *GCH1* | GWAS | rs11158026 |  |  | rs11158026 | rs11158026 |
| *VPS13C* | GWAS | rs2414739 |  |  | rs2414739 | rs2414739 |
| *ZNF646* | GWAS | rs14235 |  |  | rs14235 | rs14235 |
| *MAPT* | GWAS | rs17649553 |  |  | rs17649553 | rs17649553 |
| *SYT4* | GWAS | rs12456492 |  |  | rs12456492 | rs12456492 |
| *DDRGK1* | GWAS | rs8118008 |  |  | rs8118008 | rs8118008 |
| *RP1–13N12.1* | GWAS | rs591323 |  |  | rs591323 | rs591323 |
| *SREBF1/RAI1* | GWAS | rs11868035 |  |  | rs11868035 | rs11868035 |
|  |  |  |  |  |  |  |
| **Internal candidate genes for autosomal recessive PD** |  |  |  |  |
| *PSMB10* |  | NM\_002801.3 |  |  |  | *PSMB10* |
| *SSH2* |  | NM\_001282129.1 |  |  |  | *SSH2* |
| *COX5A* |  | NM\_004255.3 |  |  |  | *COX5A* |
| *PSME3* |  | NM\_176863.2 |  |  |  | *PSME3* |
| *COX19* |  | NM\_001031617.2 |  |  |  | *COX19* |
| *NAPRT* |  | NM\_145201.5 |  |  |  | *NAPRT* |
| *EPG5* |  | NM\_020964.2 |  |  |  | *EPG5* |
| *PSMF1* |  | NM\_178578.3 |  |  |  | *PSMF1* |

Nota: All gene sequences were obtained from the latest build of the human reference genome, GRCh38 (for Genome Research Consortium human build 38) or hg38 (for Human genome build 38).