

## Description of Additional Supplementary Files

File Name: Supplementary Data 1

Description: Summary statistics from the RBD genome-wide association study meta-analysis (repeated logistic regression across the genome, adjusted for age, sex, and principal components) for variants used in polygenic risk score analyses. P-values displayed are unadjusted and two-sided.

File Name: Supplementary Data 2

Description: Results of colocalization analysis using the RBD GWAS and eQTLs derived from eQTLGen and PsychENCODE.

File Name: Supplementary Data 3

Description: Specificity values of *MMRNI* and *SNCA-ASI* in GTEx and AIBS datasets.

File Name: Supplementary Data 4

Description: Detailed significant results from gene-set enrichment with WebGestalt. Two-sided p-values are displayed both unadjusted and FDR-adjusted.

File Name: Supplementary Data 5

Description: GWAS summary statistics for all GWAS (logistic regression, case status as dependent variable)-nominated synucleinopathy loci in PD, iRBD, PD+pRBD, the RBD meta-analysis, DLB, and PD age at onset GWAS (linear regression, age at onset as dependent variable). P-values are unadjusted and two-sided.

File Name: Supplementary Data 6

Description: LD-score regression genetic correlation results for iRBD, PD+pRBD, and the RBD GWAS meta-analysis. Two sided correlation p-values are displayed both unadjusted and FDR-adjusted.