Supplementary Materials

1. Supplementary Methods

Study Population: We initially compared peripheral blood monocytes (PBMCs) telomere length in 109 community based cases with Parkinson's Disease (PD) fulfilling UK-PD Society brain bank criteria for the diagnosis of PD (Hughes et al., 1992) (mean age 71.41 years, SD = 8.04, 61% male) from the North East of England to an ethnically age and gender matched control group (N = 99, mean age 69.69 years, SD = 7.88, 46% male), with no clinical evidence of PD. All were of Caucasian origin. We subsequently collected mid-brain sections from 45 brains; 28 PD patients (mean age 72.3, SD = 24.3) and 17 age-matched controls (mean age 77.0 SD = 12.0). Mean post mortem delay was 35.7hrs (PD cases = 35.5 compared to controls = 31.2, NS). The *substantia nigra* was micro-dissected from each section before DNA extraction.

Molecular genetics analysis: Telomere length was measured as previously described (Cawthon et al., 2003; Martin-Ruiz et al., 2004). Briefly, high molecular weight DNA was isolated from PBMC samples stored at −196 °C and DNA concentration and quality were measured by agarose gel electrophoresis. Telomere length was measured as abundance of telomeric template versus a single gene by quantitative real-time PCR (Martin-Ruiz et al., 2004). Measurements were performed in quadruplicate. Three DNA samples with known telomere lengths (3.0, 5.5 and 9.5kbp) were run as internal standards together with each batch of 7 study samples. The coefficient of variation of the telomere measurement was <3%. MtDNA haplogroups were determined in a previous (Martin-Ruiz et al., 2004).

2. Power calculation

Statistical power calculations were carried out using
http://www.dssresearch.com/toolkit/spcalc/power_a2.asp

PBMC telomere length;
For 109 affected PD patients and 99 healthy controls, the power to detect a 150bp difference in PBMC telomere length between the groups was 99.3% at the 0.05 significance level (assuming a 5% standard deviation in telomere length in each group).

Substantia nigra telomere length;
For 28 affected PD patients and 17 healthy controls, the power to detect a 400bp difference in *substantia nigra* telomere length between groups was 89.0% at the 0.05 significance level (assuming a 5% standard deviation in telomere length).

References

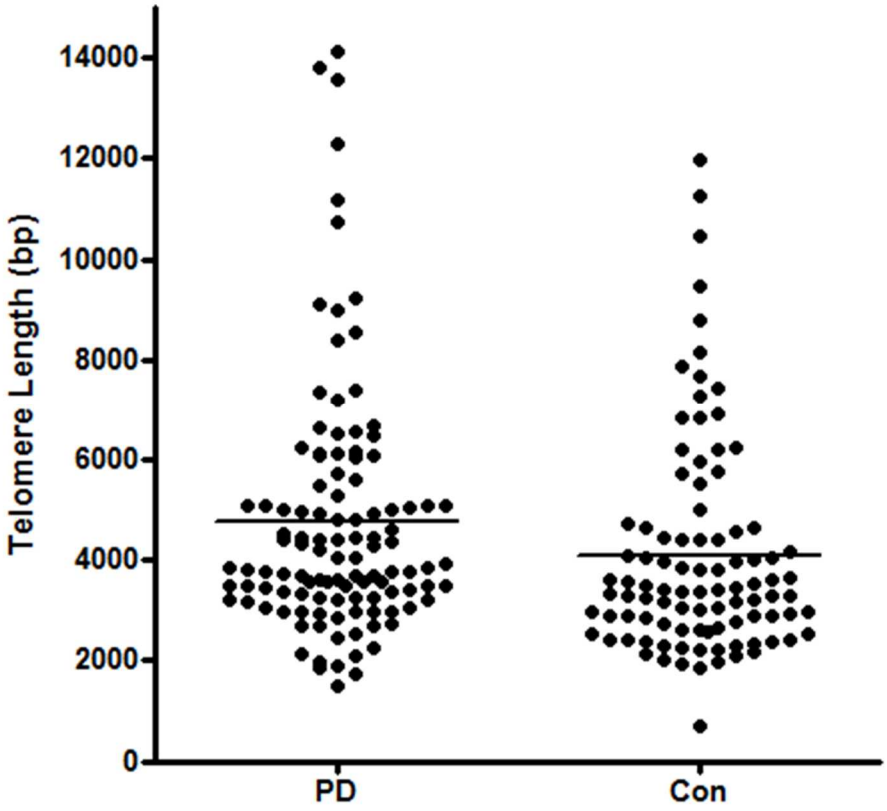
Cawthon, R.M., Smith, K.R., O'Brien, E., Sivatchenko, A., Kerber, R.A., 2003. Association between telomere length in blood and mortality in people aged 60 years or older. Lancet 361, 393-395.

Hughes, A.J., Daniel, S.E., Kilford, L., Lees, A.J., 1992. Accuracy of clinical diagnosis of idiopathic Parkinson's disease: a clinico-pathological study of 100 cases. J Neurol Neurosurg Psychiatry 55, 181-184.

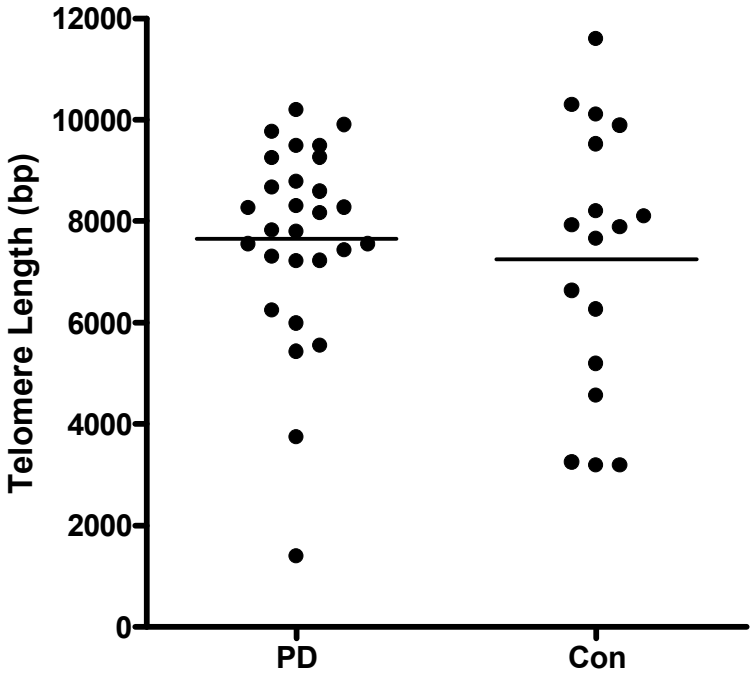
Martin-Ruiz, C., Saretzki, G., Petrie, J., Ladhoff, J., Jeyapalan, J., Wei, W., Sedivy, J., von Zglinicki, T., 2004. Stochastic variation in telomere shortening rate causes heterogeneity of human fibroblast replicative life span. J Biol Chem 279, 17826-17833.

Torroni, A., Huoponen, K., Francalacci, P., Petrozzi, M., Morelli, L., Scozzari, R., Obinu, D., Savontaus, M.L., Wallace, D.C., 1996. Classification of European mtDNAs from an analysis of three European populations. Genetics 144, 1835-1850.

Supplementary Fig. 1
Peripheral blood monocyte telomere lengths in Parkinson's disease patients (PD) and their age-matched spousal controls (Con).



Supplementary Fig. 2
Substantia nigra telomere lengths in Parkinson's disease patients (PD) and their age-matched spousal controls (Con).



Supplementary Fig. 3

Peripheral blood monocyte telomere lengths separated by gender in Parkinson's disease patients (PD) and their age-matched spousal controls (Con) (Where P = 2-sample t-test) .