Supporting Information

Deng *et al.* 10.1073/pnas.0803998105

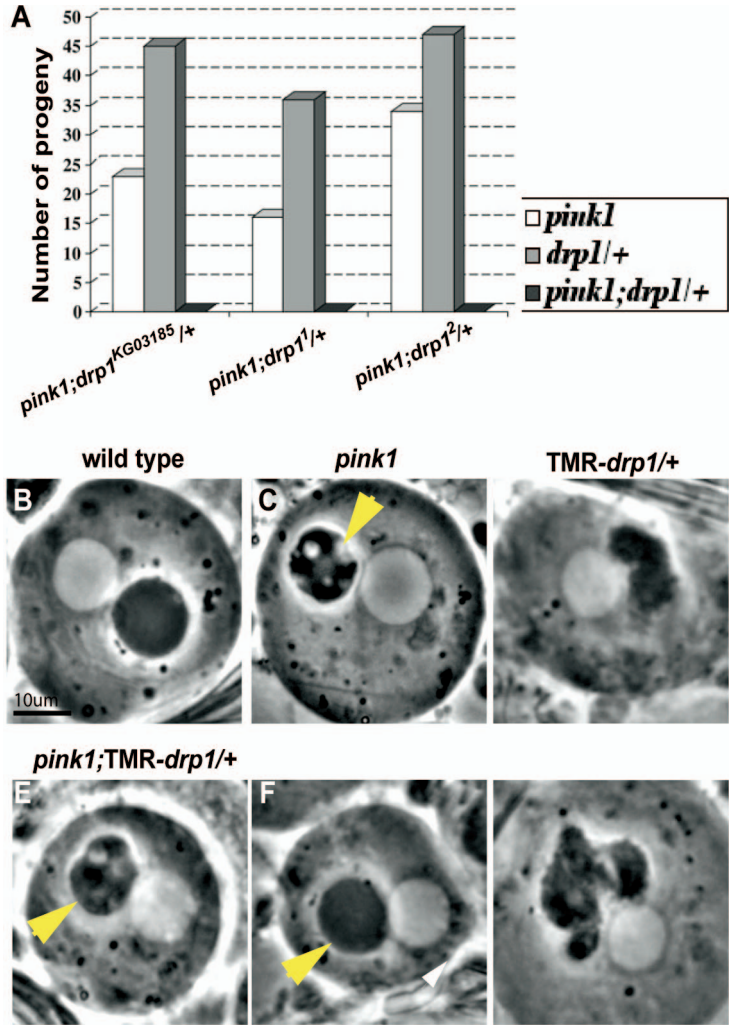

Fig. S1. Genetic interactions between *pink1* and *drp1*. (*A*) Synthetic lethality in *pink1* mutants carrying a heterozygous mutation in *drp1*. Three different sets of experiments using three independent alleles of *drp1* ($drp1^{1}$, $drp1^{2}$ and $drp1^{KG03185}$) are shown. (*B–G*) Phase-contrast images of onion-staged spermatids with various genotypes. Yellow arrows point to the nebenkerns. Testes-specific overexpression of *drp1* (TMR-*drp1*) results in abnormal nebenkerns reminiscent of those seen in *fzo* mutants in a portion of flies (*D*). *drp1* overexpression in the *pink1*-mutant background (*E–G*) results in a range of phenotypes. Some nebenkerns are *pink1* mutant-like (*E*), some appear normal (*F*), and others show bizarre shapes (*G*). In any event, the partial suppression of the *pink1* phenotypes suggests an interaction between *pink1* and *drp1*. The variable phenotypes associated with *drp1* overexpression are likely caused by the late expression timing of the promoter (TMR, i.e., β2-tubulin, which is expressed just before the onion stage). (Scale bars: 10 μm.)

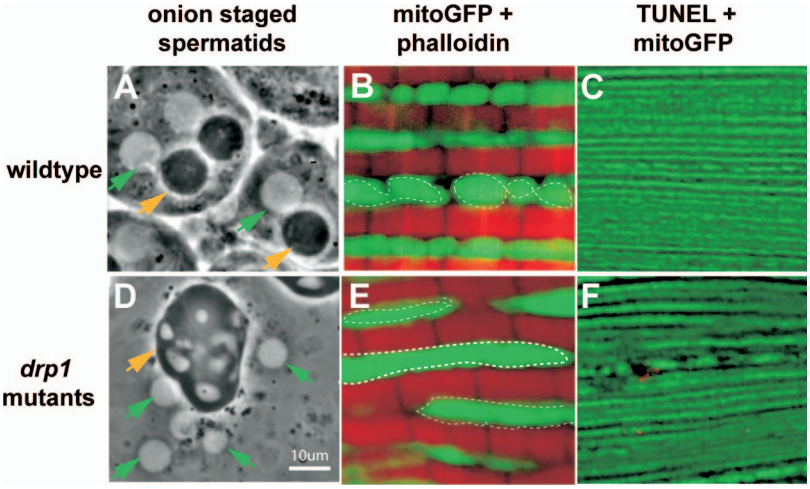

Fig. S2. *drp1* mutants show testes and muscle phenotypes distinct from *pink1* mutants. $drp1^2$ mutants are largely lethal. However, rare adult escaper males show aberrant nebenkerns. Compared with WT specimens (*A*), mitochondria in *drp1* mutant spermatids exhibit large, bizarrely shaped blobs (orange arrow). They also contain irregularly shaped phase-light materials distinct from the phase-light nucleus (green arrow) (*D*). The borders of some mitochondria are marked with white dashed lines. Note that the cytoplasmic bridges connecting spermatids are disrupted during sample preparation. Our results are consistent with a previous study in which lack of *drp1* function in germline clones displayed defects in distribution of mitochondria to spermatids, which results in mitochondria being stuck in ring canals linking nearby spermatids [Aldridge AC *et al.* (2007) Roles for Drp1, a dynamin-related protein, and Milton, a kinesin-associated protein, in mitochondrial segregation, unfurling and elongation during Drosophila spermatogenesis. *Fly* 1:38–46]. Compared with wildtype (*B*), muscles from *drp1* mutant flies show elongated mitochondria (*E*) but no clumps (*F*), which is different from *pink1* mutant phenotypes (Fig. 3 *B* and *G*). In addition, *drp1* mutant flies do not show TUNEL positive signals (*F*), which is also different from *pink1* mutants (Fig. 5*E*). (Scale bars: 10 μm in *A* and *D*.)