Supplementary Figure 1. New mutations in the TOC1 protein.

Cartoon illustrating the position and nature of the two new *toc1* alleles represented by the Tc442 and Tc522 mutants. The pseudo receiver (PR) and the "CO, COL and TOC1" (CCT) domains of the TOC1 protein are indicated by grey and striped boxes, respectively. The first two alleles identified (*toc1-1* and *toc1-2*) are also shown.

Supplementary Figure 2. The effect of *ztl* mutations under diurnal and constant dark conditions.

CCA1:LUC+ rhythm of *ztl* mutants under LD 8,16, using blue + red light at ~5 μmol·m^{-2}·s^{-1} (A); *CCR2:LUC*+ rhythm of *ztl* mutants in DD (B) and under LD 8,16, using white light at ~15 μmol·m^{-2}·s^{-1} (C).

Supplementary Figure 3. *ZTL* mRNA levels in the *ztl* mutants.

Seedlings were grown under LD 12,12 cycles for one week then samples were harvested at ZT12. *ZTL* and *18S* rRNA levels were analysed by Northern blotting. The results of three independent experiments are summarised on panel A showing *ZTL* mRNA levels relative to the *18S* rRNA transcript in wild type (WT) and *ztl* mutant plants. A representative Norhern blot is shown on panel B. Error bars represent standard error values.

Supplementary Figure 4. The effect of *ztl* mutations on the free running period length and hypocotyl elongation under varying fluence rates of blue light.

Fluence rate response curves were determined from the period of *CAB2:LUC* (in C24 background) or *CAB2:LUC*+ (in WS background) reporter gene activity under continuous blue light (A, B). Plants were entrained in LD 12:12 for 7 days prior to free run in constant light. Hypocotyl length of 4-day-old seedlings grown in continuous blue light (C, D) of indicated fluence rates. Data were normalised to the hypocotyl length of

the corresponding dark-grown controls. Error bars represent standard error values on all panels.

Supplementary Figure 5. Rhythmic *CCR2:LUC+* expression in dark-grown and dark-adapting plants.

ztl mutant and wild type (WT) seedlings were grown in constant darkness under temperature cycles (12h 26^{o}C / 12h 22^{o}C) for three days (A) or at constant temperature (22^{o}C) under 12h white light / 12h dark cycles for six days (B). All plants were transferred to constant temperature (22^{o}C) and darkness at ZT12 and rhythmic *CCR2:LUC+* activity was recorded during the following six days. White, black, red and blue bars along the time axis represent light, dark, 26^{o}C and 22^{o}C conditions, respectively.

Supplementary Figure 6. Growth of yeast strains in assays for ZTL protein interaction with PHYB.

5 µl of overnight yeast cell cultures (strain AH109), transformed with the indicated plasmids, were dropped and grown on selective medium (HLW + 1mM 3-AT) in the presence of 20µM the chromophore (PCB) under constant dark (DARK) or red (1 µmol·m^{-2}·s^{-1}) light (RED) conditions for three days, or cell cultures were dropped on non-selective medium (LW) and incubated in the dark for three days. HLW: histidine-, leucine- and tryptophan-free medium; LW: leucine- and tryptophan-free medium; 3-AT: 3-aminotriazole; PCB: phycocyanobilin.