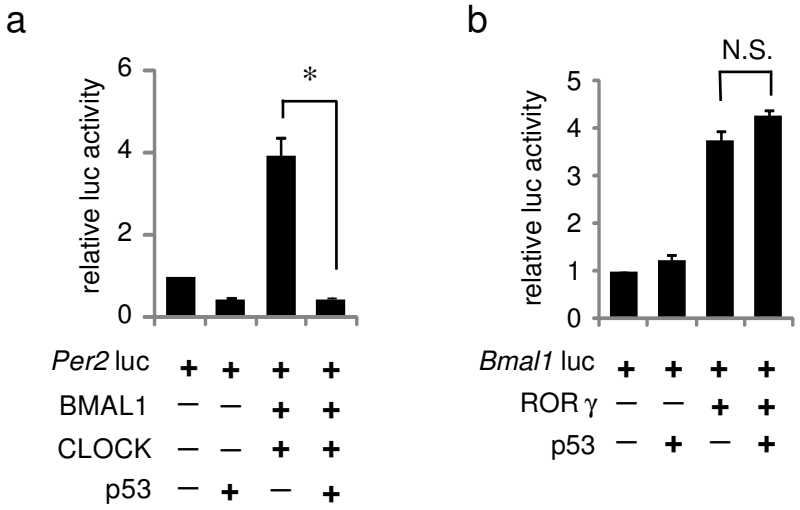
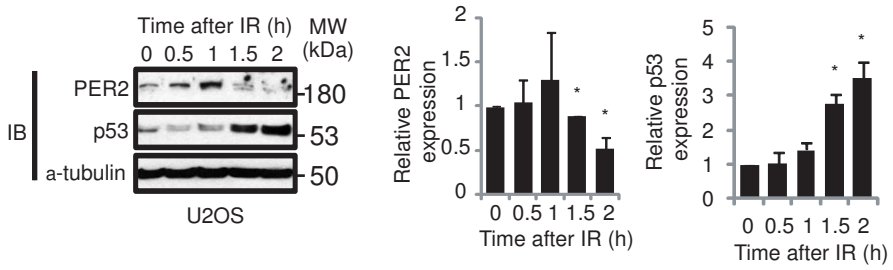
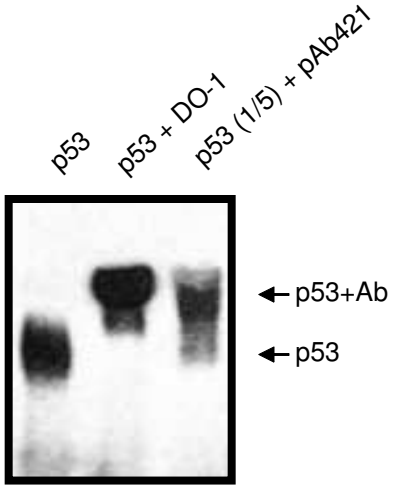


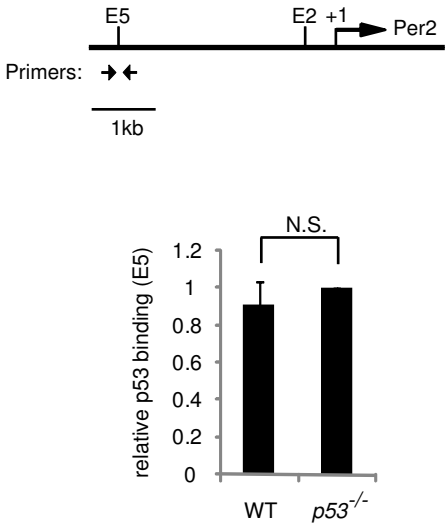
Supplementary Figure S1. p53 effects on the *mPer2* and *mBmal1* promoter in HeLa cells. (a) *Per2* or (b) *Bmal1* promoter luciferase reporter assays were performed in HeLa cells transfected with the indicated expression vectors. Cells were harvested 24 h after transfection. n>3. Error bars are mean ± SEM. t-test: *p< 0.05 N.S., not significant.



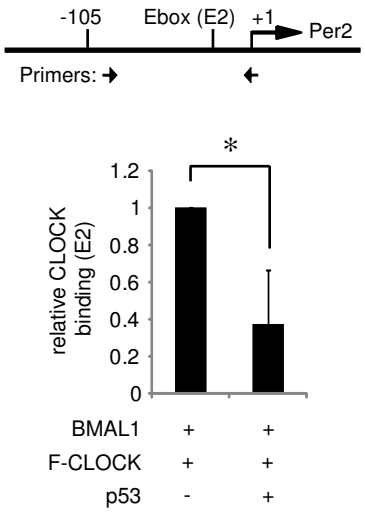
Supplementary FIgure S2. Down-regulation of PER2 in U2OS cells after irradiation. U2OS cells were treated with γ-irradiation (10Gy) and cell lysates were analyzed by immunoblotting using indicated antibodies. Quantification is shown on the right (n=3). Error bars; mean ± SEM. t-test: ∗p< 0.05.



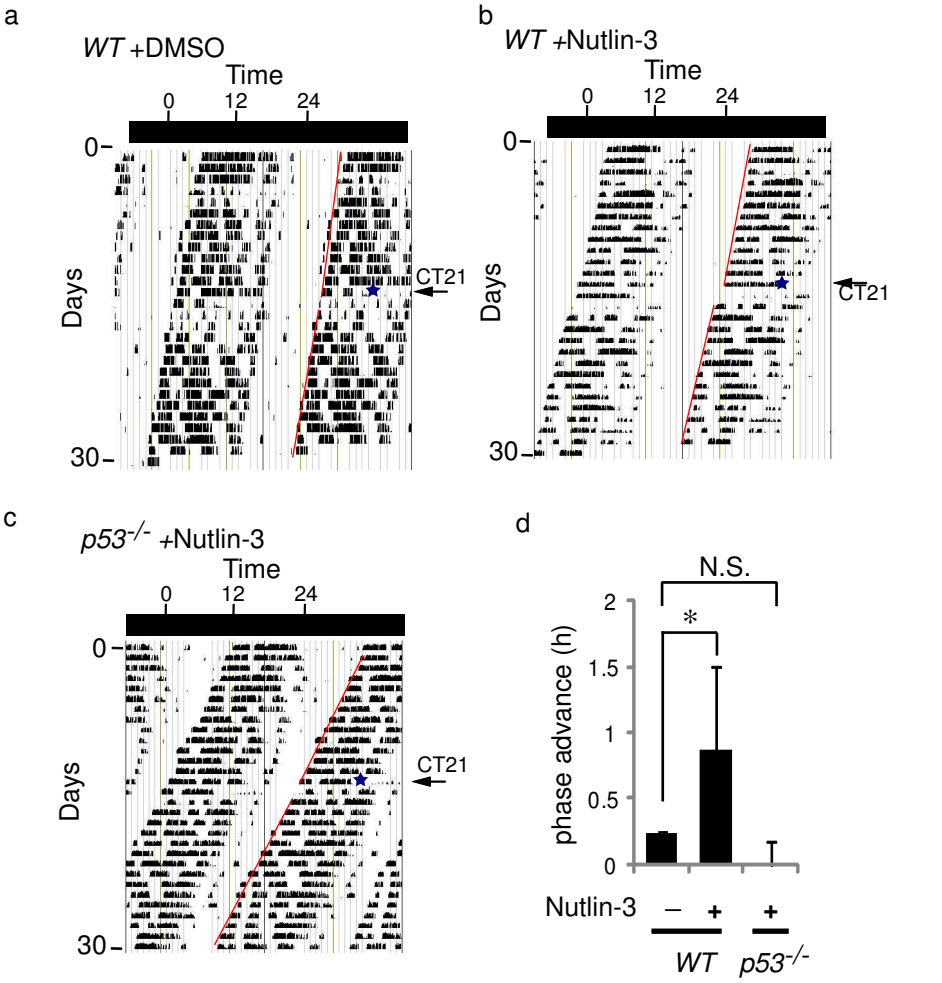
Supplementary Figure S3. Supershift of p53 containing band in EMSA. p53 binding to the *Per2* promoter consensus region is examined by EMSA. Two independent anti-p53 antibodies (DO-1 or pAb421) show supershift of the band.



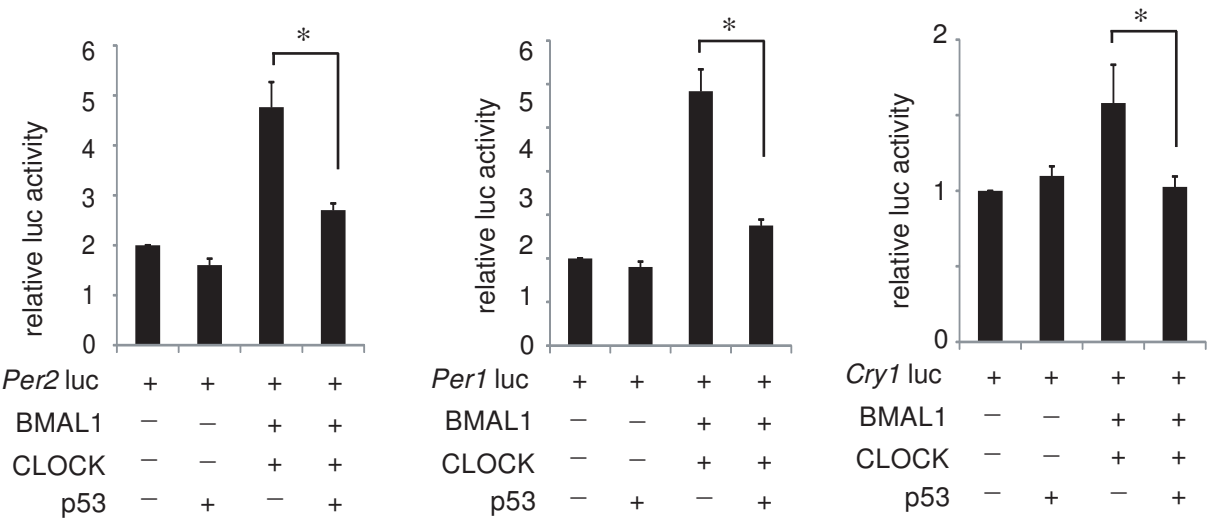
Supplementary Figure S4. p53 binding on *mPer2* promoter (E5).
CHIP assay performed for the *Per2* promoter E5 region using p53 antibody and extracts from WT and *p53*$^{-/-}$ MEF cells. Specific primers for E5 were used for qPCR analysis.
The signal obtained from *p53*$^{-/-}$ MEF cells was set to 1.0. n=2, t-test: N.S., Not Significant.



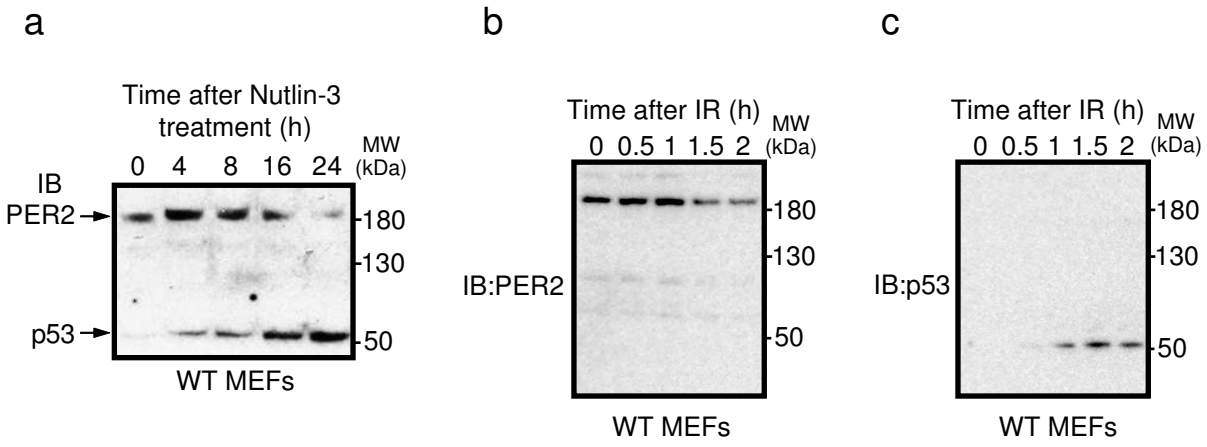
Supplementary Figure S5. CLOCK/BMAL1 binding on Per2 promoter was modulated by p53 expression. CLOCK/BMAL1 binding to the *Per2* promoter examined by ChIP in the presence or absence of p53. *p53*$^{-/-}$ MEF cells were transfected with the indicated protein expression vectors and CHIP assay was performed using an anti-FLAG antibody. Primers for the E2 E-box region were used for qPCR analysis. *p53*$^{-/-}$ MEF cells transfected with BMAL1/FLAG-CLOCK was set to 1.0. Error bar: mean ± SEM. t-test: $*p< 0.05$.



Supplementary Figure S6. Effect of Nutlin-3 injection on phase shift. Actograms show double plotted wheel-running activity. *Wild type* (a, b) or *p53*$^{-/-}$ mice (c) were kept in a DD cycle for 2 weeks and one injection of Vehicle (DMSO) or Nutlin-3 was given at CT21. (d) Quantification of phase advance is performed (n>2).Error bars are mean ± SEM. t-test: N.S., not Significant. ∗p< 0.05



Supplementary Figure S7. Effect of p53 expression on *mPer2*, *mPer1* and *mCry1* promoter. m*Per2*, m*Per1* or m*Cry1* promoter luciferase reporter assays were performed in Wildtype MEF cells transfected with the indicated expression vectors. Cells were harvested 24 h after transfection. Error bars are mean SEM. t-test: ∗p< 0.05



Supplementary Figure S8. Full-length images of immunoblots. (a) Full length image of Figure 1d. Immunoblotting was performed with an anti-mPer2 and an anti-p53 antibody. (b), (c) Full-length images of Figure 1h. Immunoblotting was performed with an anti-mPER2 (b) or an anti-p53 antibody (c).