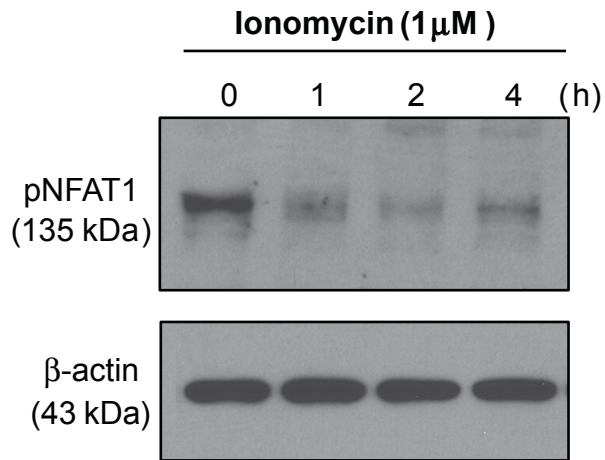
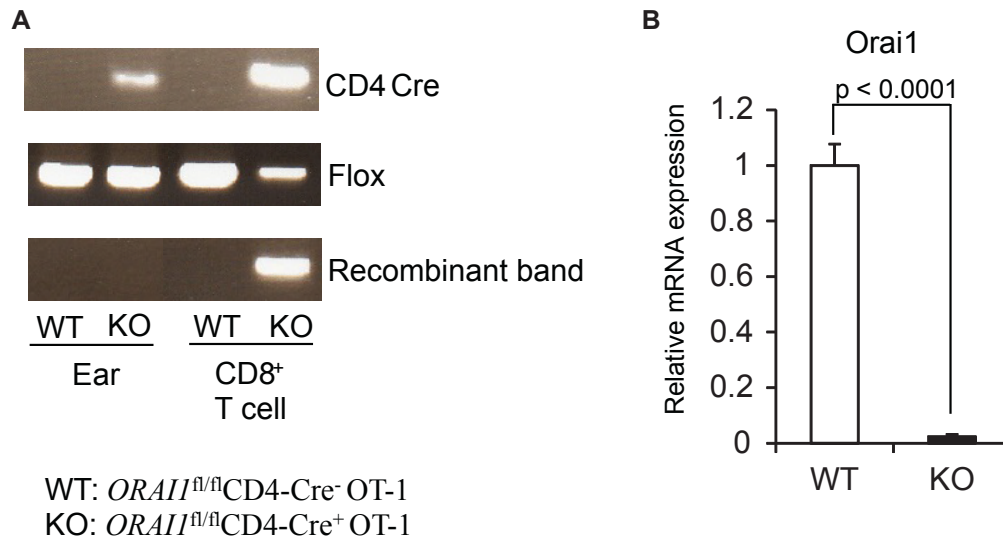


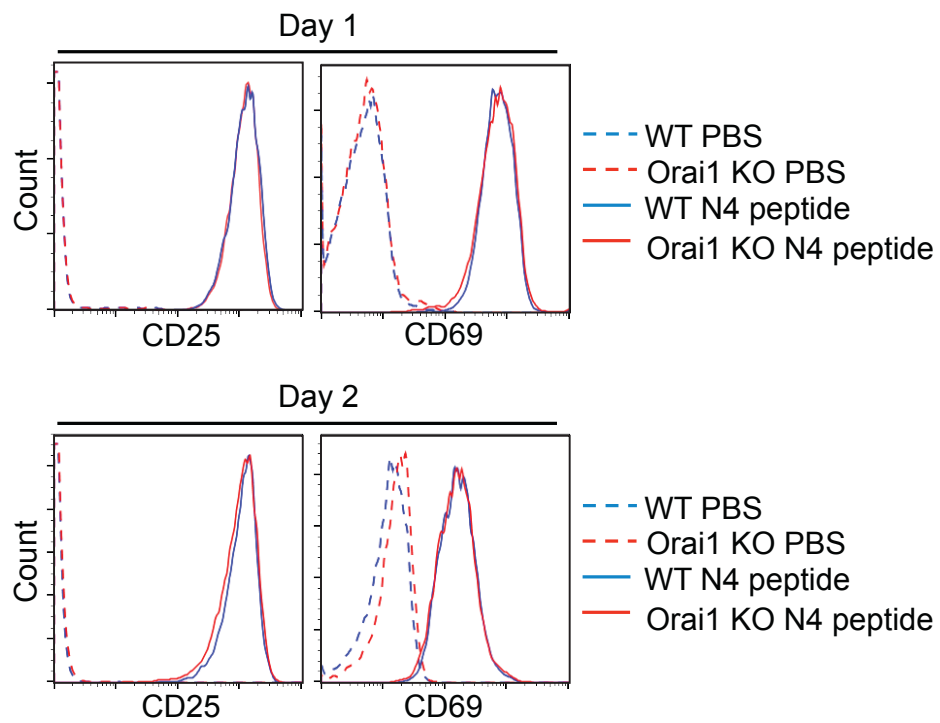
**Supplementary Figure 1.** T cell infiltration in the B16F10 melanoma. B16F10 melanoma cells were intradermally injected into the mouse ear skin. Tumor samples were collected on days 7, 14 and 21 ( $n > 5$ ). CD4<sup>+</sup> Foxp3<sup>-</sup> T cells, CD8<sup>+</sup> T cells and CD4<sup>+</sup>Foxp3<sup>+</sup> Treg cells were monitored by flow cytometry. Data were analyzed with Student's *t*-test.



**Supplementary Figure 2.** Treatment of OT-I CTLs with ionomycin resulted in the dephosphorylation of NFAT1. OT-I CTLs were stimulated by 1  $\mu$ M ionomycin for indicated times, and lysed in RIPA buffer. The cell lysates were analyzed by immunoblotting using anti-phospho-NFAT1 or anti- $\beta$ -actin.

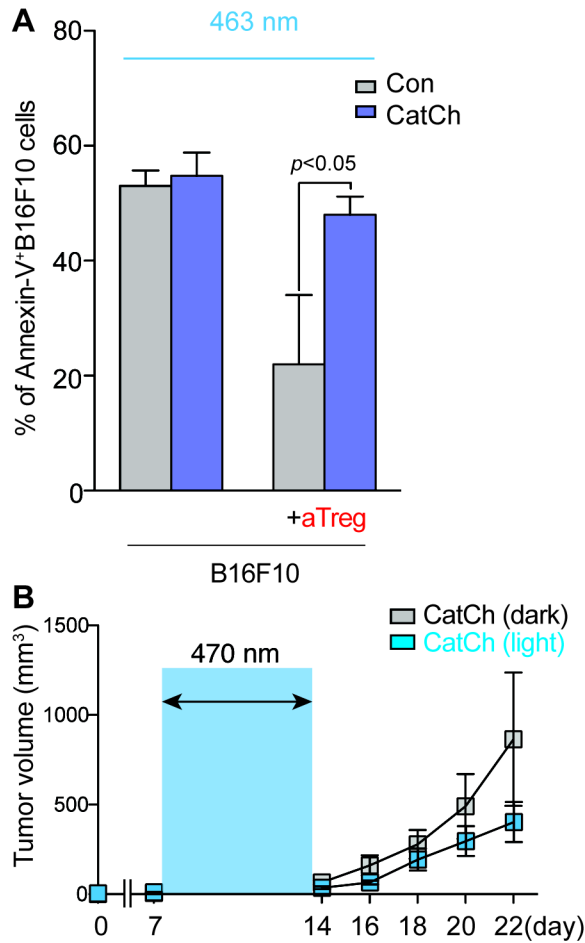


**Supplementary Figure 3.** Genotypic characterization and identification of CD4-cre Orai1 conditional knockout mice. (a) Genomic DNA samples were prepared from the mice ears and purified CD8<sup>+</sup> T cells, and PCR was performed using primers for the Cre gene sequence, intact Orai1-floxed allele and the recombined Orai1 allele. (b) The mRNA expression level of Orai1 was analyzed by quantitative RT-PCR (n = 3). Data were analyzed with Student's *t*-test.

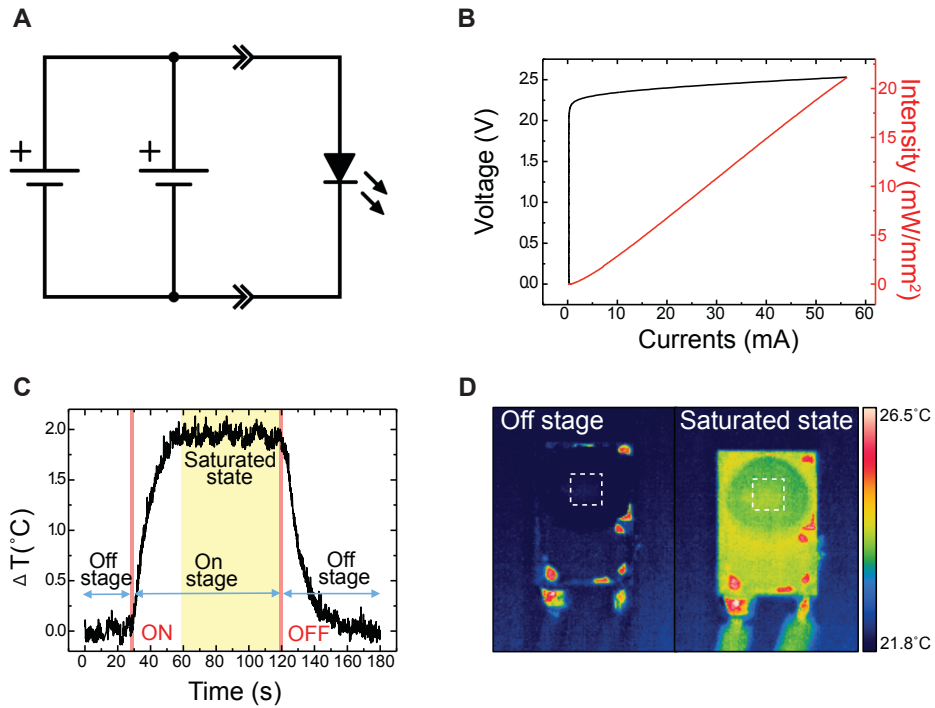


**Supplementary Figure 4.** Activation of WT and Orai1 cKO OT-I CTLs after N4 peptide stimulation. Purified OT-I CD8<sup>+</sup> T cells were stimulated with N4 peptide and irradiated splenocytes. Expression of CD25 and CD69 were measured by flow cytometry.





**Supplementary Figure 5.** (a) Killing of hgp100<sub>25-33</sub> peptide-loaded B16F10 cells after light stimulation of CatCh- or GFP-expressing Pmel-1 CD8<sup>+</sup> T cells for 16 h in the presence or absence of aTregs (n = 4). (b) Growth curves of B16 tumors on the ear treated with adoptive transfer of CatCh-expressing Pmel-1 CD8<sup>+</sup> T cells with vaccination with mgp100<sub>25-33</sub> (EGSRNQDWL) (light, n = 5; dark, n = 6). The light stimulation (470-nm) times are denoted with a blue box. Data were analyzed with Student's *t*-test.



**Supplementary Figure 6.** Battery powered LED operation and its electrical, optical, and thermal properties. (A) A scheme of battery powered LED system. (B) Light output-current and voltage (LIV) measurement for a 505 nm LED. (C) Temperature variation of the LED system for 90 second operation. (D) Measured temperature distribution for the LED system at off and on (saturated) stage.

Figure 1j: phospho-NFAT1 western blot

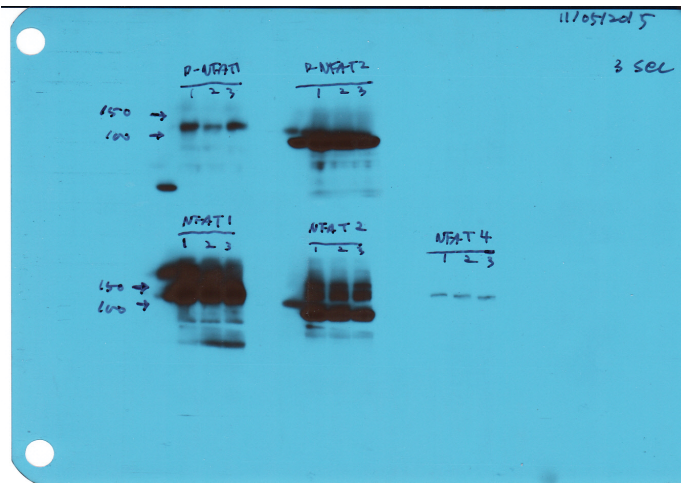


Figure 1j: NFAT1 western blot

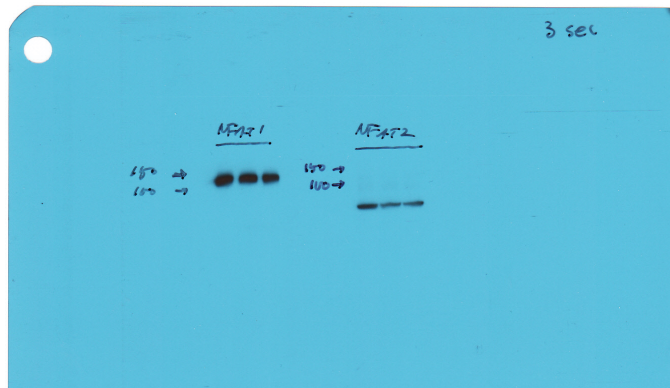
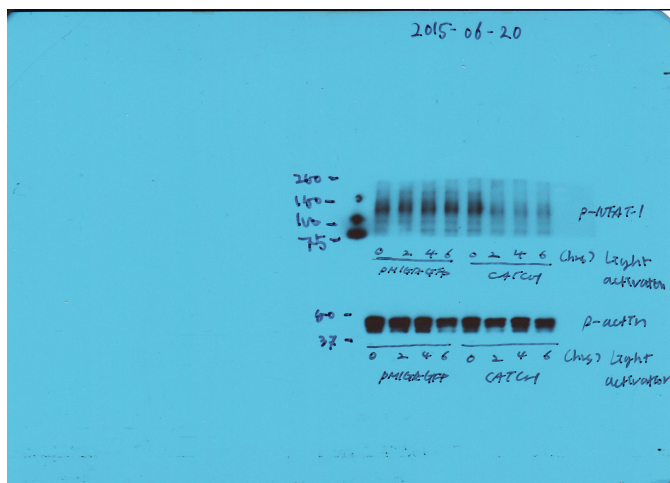


Figure 3b: Phospho-NFAT1 and beta-actin western blot



Supplementary Figure 7. Uncropped Western blots for shown in the manuscript.