Supplementary Fig. 1. Dermal inflammatory cells are diminished by Tyk2 deficiency in IL-23-induced skin inflammation. Dermal cells were isolated from digested Tyk2+/+ and Tyk2−/− ear skin on day 4, and subjected to flow cytometry. The absolute number of inflammatory cells from uniformly collected ear tissue by biopsy punch is shown. Data represents mean ± SD (n=5). **p<0.01, ***p<0.001 compared with BSA-injected mice group; ###p<0.001 compared with Tyk2−/− mice group. Similar results were obtained in two independent experiments. (B) Tyk2+/+ and Tyk2−/− mice were intradermally injected with 1 µg/ear of IL-23 or BSA for every day. mRNAs were prepared from the ear draining LN of Tyk2+/+ and Tyk2−/− mice on day 4, and subjected to quantitative RT-PCR with the indicated primers. Gene expression level was normalized by GAPDH expression. Data represents mean ± SD (n=5). *p<0.05, **p<0.01 compared with BSA-injected mice group; apia<0.05, apia<0.01 compared with Tyk2−/− mice group. Similar results were obtained in two independent experiments.
Supplemental Fig. 2

(A) The ear pinna of Tyk2+/+ and Tyk2−/− mice was intradermally injected with 1 µg/ear of IL-23 or BSA on an intermissive schedule, 5-times in 10 days. Ear swelling was evaluated on the days as indicated. (B) Epidermal hyperplasia was evaluated by measuring the epidermal thickness by imaging analysis. Data represents mean ± SD (n=5). *p<0.05, **p<0.01, ***p<0.001 compared with BSA-injected mice group; ###p<0.01, ####p<0.001 compared with Tyk2−/− mice group. (C) Representative H&E stained histological features of IL-23-treated ear pinna from Tyk2+/+ and Tyk2−/− mice. Scale bar, 100 µm. (D) Flow cytometry analysis of the dermal cells isolated from pooled Tyk2+/+ and Tyk2−/− ear skin by the intermissive injection. Surface markers of major inflammatory cells were analyzed with fluorescent-labeled specific antibodies. Similar results were obtained in two independent experiments.

Supplementary Fig. 2. Involvement of Tyk2 in IL-23-induced prolonged skin inflammation. (A) The ear pinna of Tyk2+/+ and Tyk2−/− mice was intradermally injected with 1 µg/ear of IL-23 or BSA on an intermissive schedule, 5-times in 10 days. Ear swelling was evaluated on the days as indicated. (B) Epidermal hyperplasia was evaluated by measuring the epidermal thickness by imaging analysis. Data represents mean ± SD (n=5). *p<0.05, **p<0.01, ***p<0.001 compared with BSA-injected mice group; ###p<0.01, ####p<0.001 compared with Tyk2−/− mice group. (C) Representative H&E stained histological features of IL-23-treated ear pinna from Tyk2+/+ and Tyk2−/− mice. Scale bar, 100 µm. (D) Flow cytometry analysis of the dermal cells isolated from pooled Tyk2+/+ and Tyk2−/− ear skin by the intermissive injection. Surface markers of major inflammatory cells were analyzed with fluorescent-labeled specific antibodies. Similar results were obtained in two independent experiments.
**Supplementary Fig. 3.** Tyk2 directly regulates IL-22-induced skin inflammation. (A) IL-22-dependent inflammatory molecules expression in ear pinna. IL-22 was injected into the ear pinna, then the pinna was harvested from sacrificed Tyk2^{+/-} and Tyk2^{-/-} mice at 1, 3 and 6 h after the single injection. Data represents mean ± SD (n=5). *p<0.05, **p<0.01, ***p<0.001 compared with Tyk2^{+/-} mice group. (B) IL-22-dependent keratinocyte proliferation marker K16 and antimicrobial peptide expressions in the ear pinna. The ear pinna from Tyk2^{+/-} and Tyk2^{-/-} mice was harvested at 1, 3 and 6 h after the single IL-22 injection. Similar results were obtained in two independent experiments. (C) Epidermal hyperplasia is not depend on IL-17A in IL-23-induced skin inflammation. Anti-IL-17A neutralization antibody (0.1 mg/mouse) was intraperitoneally injected on day 0, then the ear pinna of Tyk2^{+/-} mice was intradermally injected with 1 µg/ear of IL-23 or BSA for 4 consecutive days. Epidermal thickness were evaluated on day 4. Data represents mean ± SD (n=5). ***p<0.001 compared with BSA. Similar results were obtained in two independent experiments.