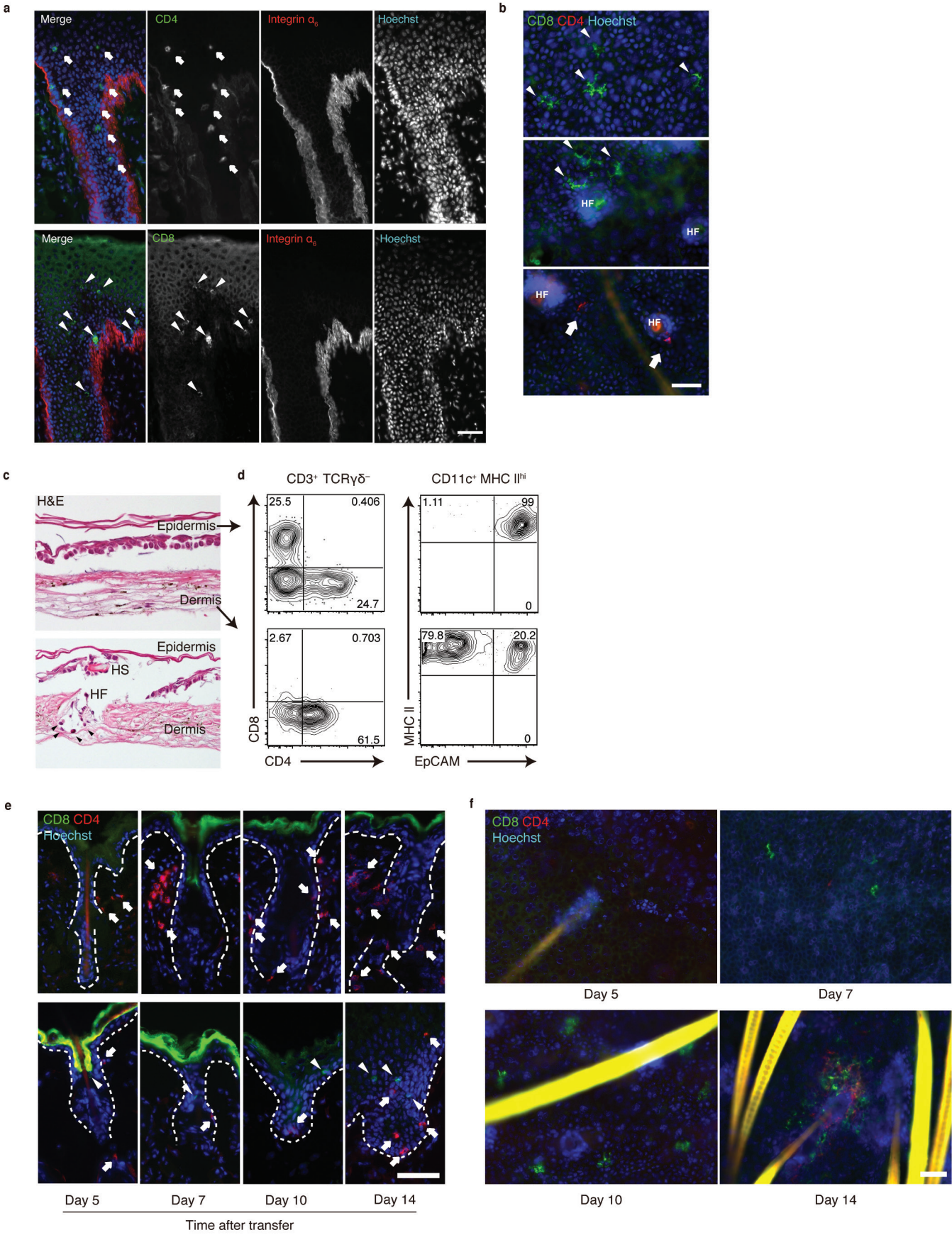
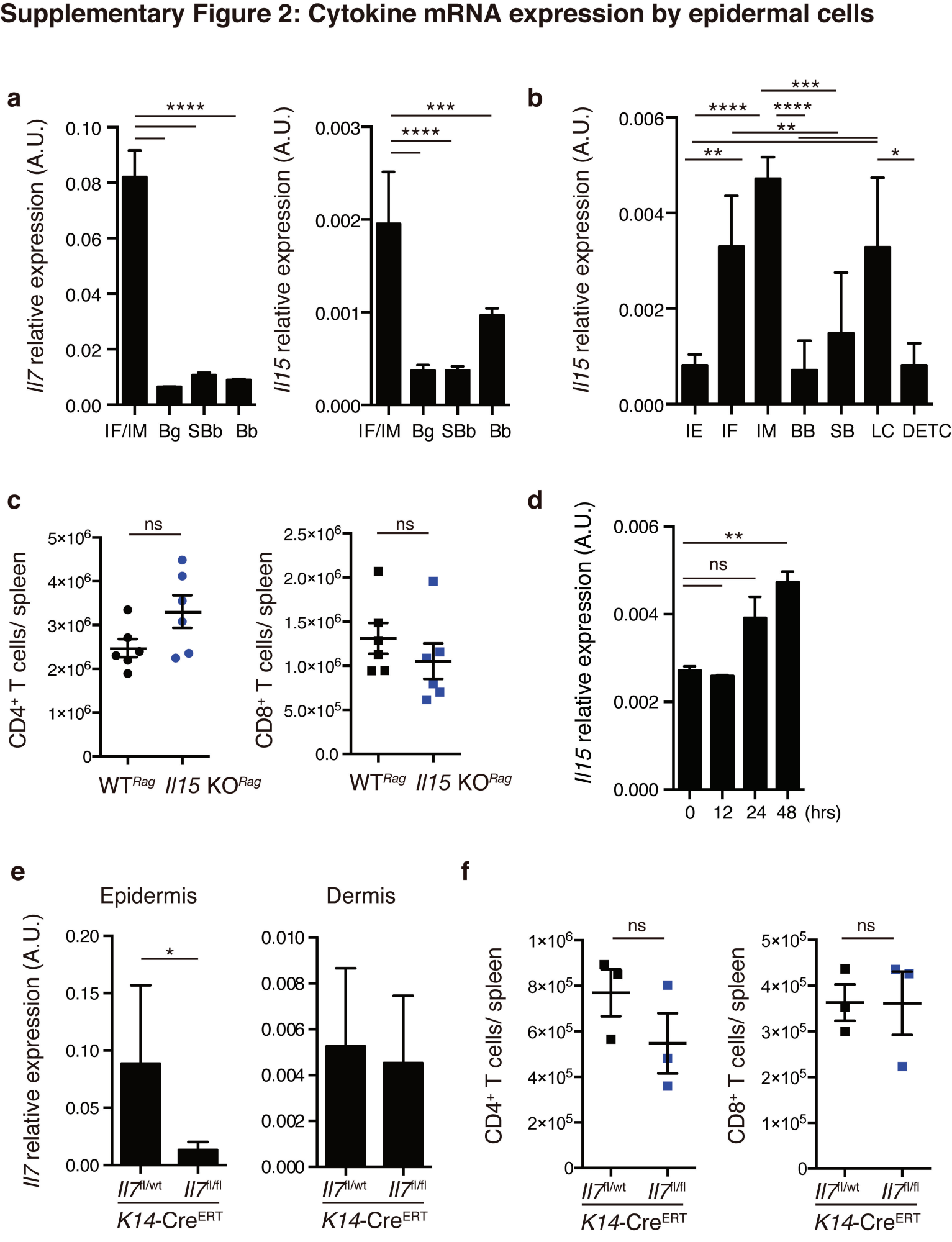
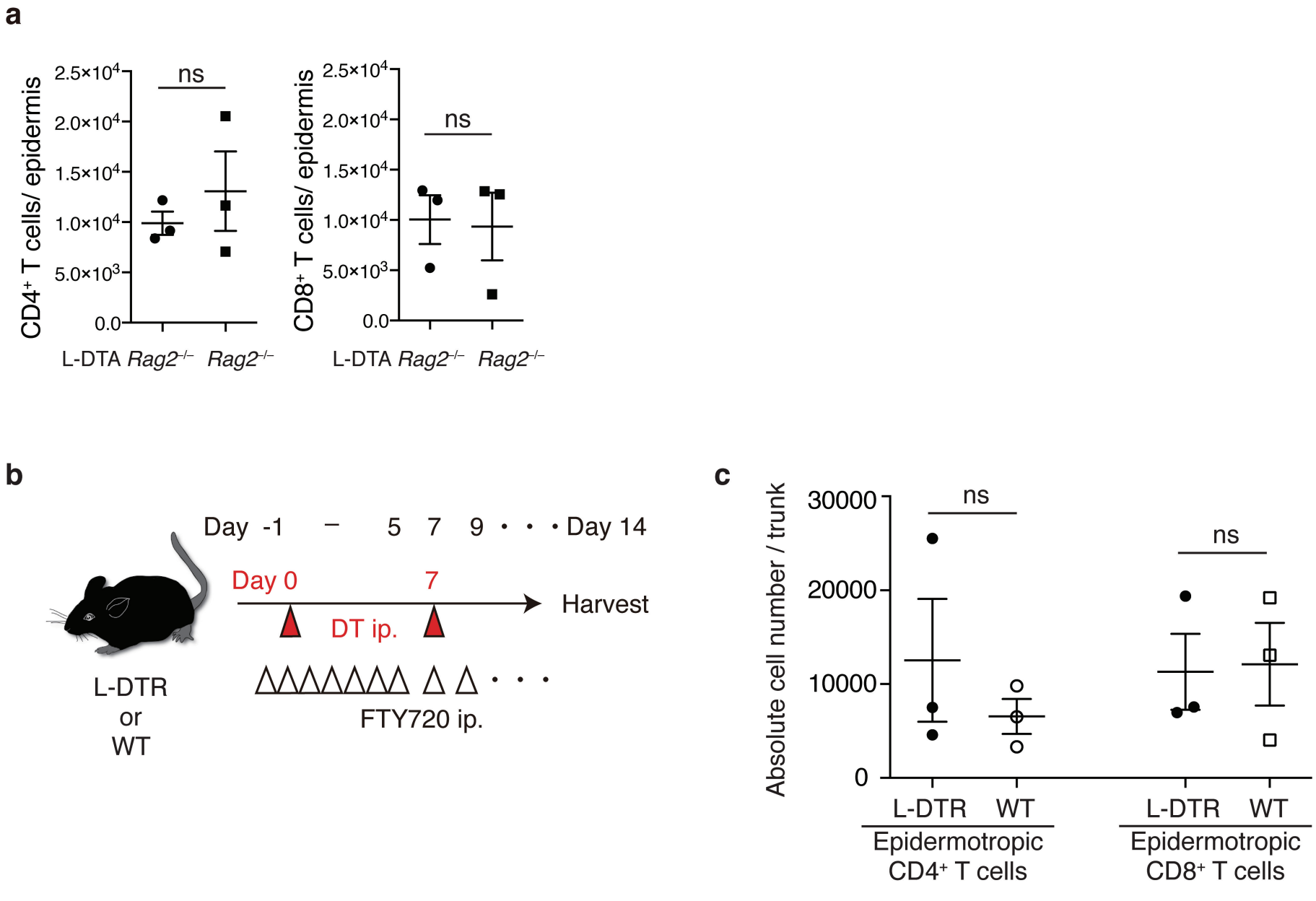
Supplementary Figure 1: Epidermal distribution of CD4⁺ and CD8⁺ T cells



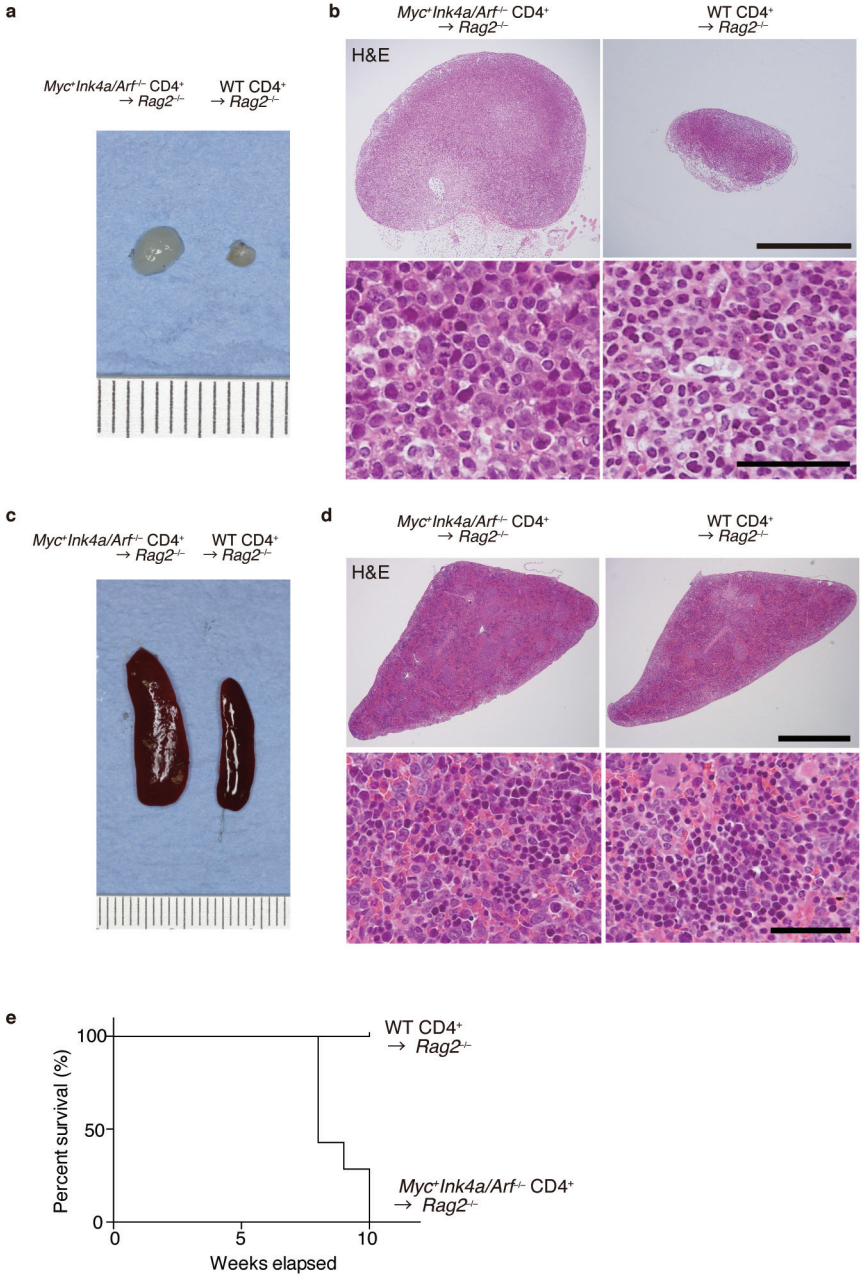
Supplementary Figure 2: Cytokine mRNA expression by epidermal cells



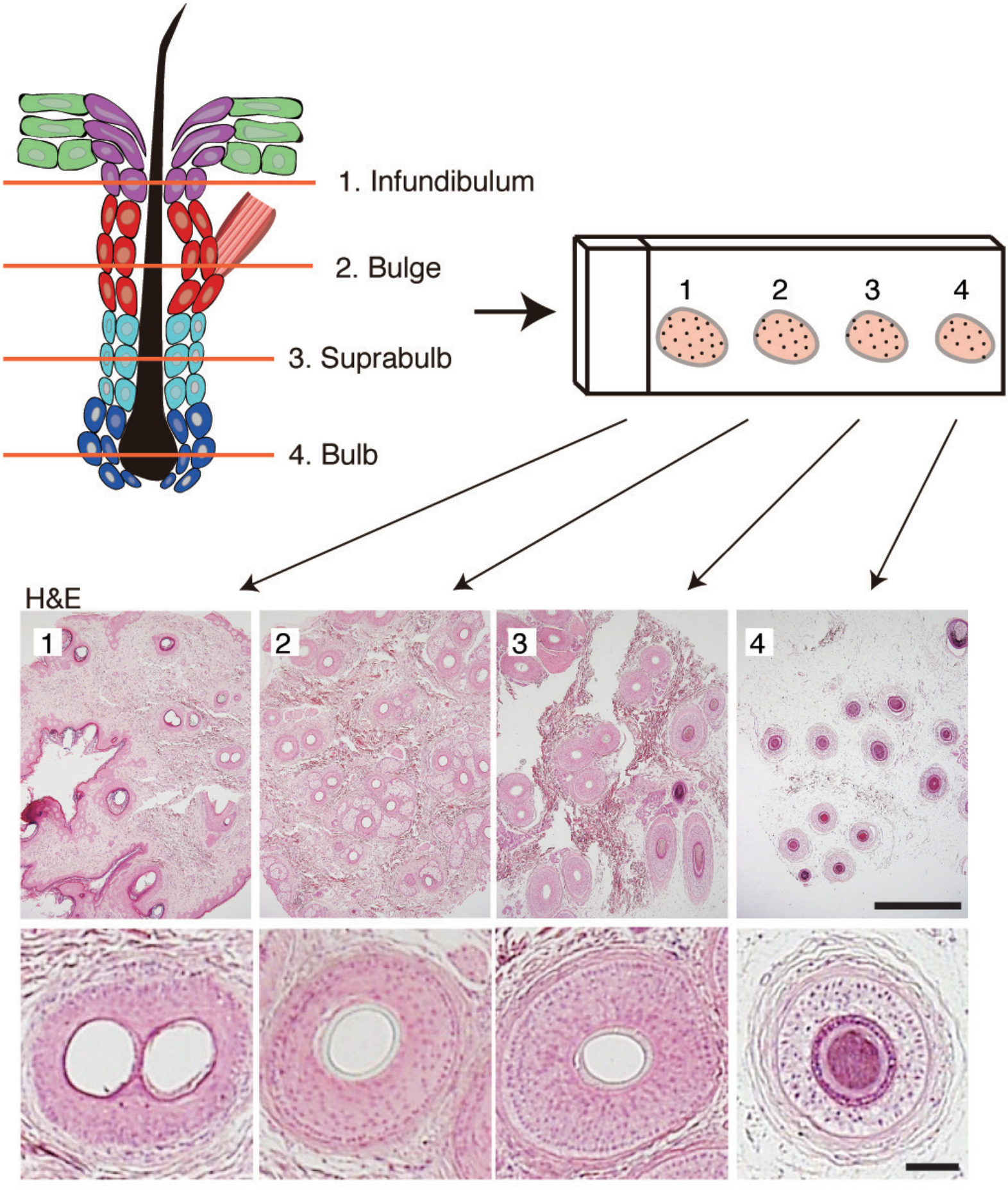
Adachi et al. Supplementary Fig. 3: Langerhans cells are dispensable for epidermotropic T_{RM}.



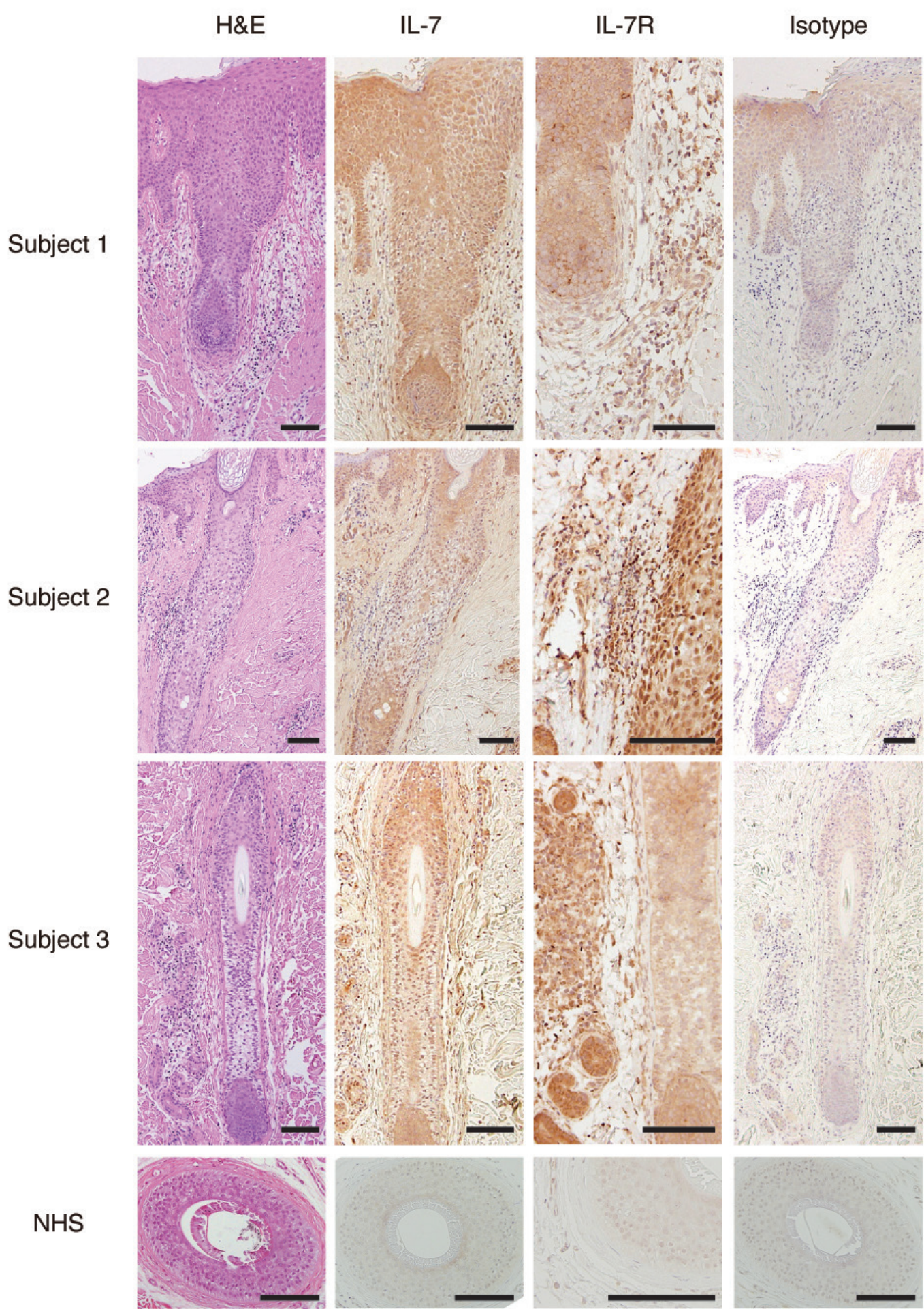
Supplementary Figure 4: Systemic lymphoma in Rag2$^{-/-}$ mice transferred with Myc^{+}Ink4a/Arf$^{-/-}$ CD4^{+} T cells.



Supplementary Figure 5: Strategy for the analysis of human hair follicles.



Supplementary Figure 6: IL-7 and IL-7R expression in lesional CTCL skin



Supplementary Table 1: List of primers utilized for real-time PCR

Mouse gene		Primer sequences
IL-7	Forward	5'-TCTGCTGCCTGTCACATCATC-3'
	Reverse	5'-TACACTCTCATATGCTTTACCTTCTTTGT-3'
IL-15	Forward	5'-GGCATTCATGTCTTCATTTTGG-3'
	Reverse	5'-TCCAGTTGGCCTCTGTTTTAGG-3'
Human gene		
IL-7	Forward	5'-TCCCCTGATCCTTGTTCTGTTG-3'
	Reverse	5'-CGATGCTGACCATTAGAACACTC-3'
IL-15	Forward	5'-TTTGGGCTGTTTCAGTGCAG-3'
	Reverse	5'-ACTTTGCAACTGGGGTGAAC-3'

Supplementary Figure Legends

Supplementary Figure 1: Epidermal distribution of $CD4^+$ and $CD8^+$ T cells.
Immunofluorescence microscopy of (**a**) skin sections or (**b**) ear epidermal sheets from unmanipulated WT mice, stained as indicated (n = 3). Integrin α_6 expression delineates the basement membrane zone. Arrowheads depict $CD8^+$ T cells and arrows depict $CD4^+$ T cells. HF, hair follicle. Scale bar, 50μm. (**c**) WT mouse skin was treated with trypsin and EDTA that were then fixed in formalin instead of undergoing preparation of epidermal cell suspension. Sections were stained for hematoxylin and eosin. HF, hair follicle. HS, hair shaft. (**d**) Flow cytometry analysis of epidermal (upper panels) and dermal (lower panels) suspensions. Cells were gated on $CD45^+CD3^+MHCII^-TCR\gamma\delta^-$ population (left panels) or $CD45^+CD11c^+MHCII^{hi}$ population (right panels) (n = 3). *Rag2*$^{-/-}$ mice were transferred with WT splenocytes, and skin samples were harvested at indicated time points. (**e**) Frozen sections and (**f**) ear epidermal sheets were stained as indicated (n = 3). Dashed lines delineate hair follicles. Scale bar, 50 μm. Data are representative of three independent experiments with three mice per group in each.

Supplementary Figure 2: Cytokine mRNA expression by epidermal cells.
(**a**) Anagen hair follicles were divided under a dissecting microscope into areas from the infundibulum/isthmus (IF/IM), bulge (Bg), suprabulb (SBb) and bulb (Bb). *Il7* and *Il15* expressions were examined via real-time PCR. (**b**) Langerhans cells (LC), dendritic epidermal T cells (DETC), and keratinocytes subsets from telogen hair follicles were sorted via flow cytometry and were analyzed via real-time PCR for *Il15* expression, presented in arbitrary units (A.U.), relative to *Actb* expression. IE: interfollicular epidermis, IF: infundibulum, IM: isthmus, BB: basal layer bulge, SB: suprabasal layer bulge. (**c**) As in Fig. 2e, bone marrow chimeric WT or *Il15*$^{-/-}$ mice that were reconstituted with *Rag2*$^{-/-}$ bone marrow (WT^{Rag} or *Il15* KO^{Rag}), and were transferred with WT splenocytes. Number of T cells in the spleens of recipient WT^{Rag} or *Il15* KO^{Rag} mice (n = 6) from Fig. 2f are shown. Symbols represent individual mice. (**d**) *Il7* expressions by epidermis or dermis after tamoxifen-induced ablation IL-7 in mice of indicated genotypes (n = 3). (**e**) Number

of T cells in the spleens from mice of indicated genotypes after tamoxifen administration (*n* = 3). (**f**) IL15 mRNA expression by epidermal keratinocytes analyzed via real-time PCR in Langerin-DTA *Rag2*$^{-/-}$ mice after lethal irradiation. X-axis numbers indicate hours after irradiation. Data are representative of two (a, b, f) or three (**c,d,e**) independent experiments. *P < 0.05, **P < 0.01, ***P < 0.001, ****P < 0.0001 (unpaired two-tailed Student's *t*-test).

Supplementary Figure 3: Langerhans cells are dispensable for epidermotropic T_{RM}.

(**a**) Effect of constitutive lack of LC on the numbers of epidermotropic T_{RM}. Epidermotropic T_{RM} from *Rag2*$^{-/-}$ or Langerin-DTA (diphtheria toxin fragment A; L-DTA) *Rag2*$^{-/-}$ mice were quantified 14 days after the transfer of splenocytes (*n* = 3) (**b**) Experimental scheme for analyzing the effect of induced LC ablation on epidermotropic T_{RM}. WT or Langerin-DTR (diphtheria toxin receptor) mice were treated with diphtheria toxin (DT) i.p. at day 0 and 7. FTY720 was injected i.p. from day -1 for 7 consecutive days and every other day thereafter, until tissues were harvested. (**c**) The numbers of epidermotropic T_{RM} after induced ablation of LC (*n* = 3). Each symbol represents an individual mouse; horizontal lines depict the mean and error bars indicate s.e.m.

Supplementary Figure 4: Systemic lymphoma in Rag2$^{-/-}$ mice transferred with Myc^{+}Ink4a/Arf$^{-/-}$ CD4^{+} T cells.

(**a**) Lymph node from *Rag2*$^{-/-}$ mice transferred with *Myc*$^{+}$*Ink4a/Arf*$^{-/-}$ CD4^{+} T cells (left) compared with that from *Rag2*$^{-/-}$ mice transferred with WT CD4^{+} T cells (right). (**b**) Hematoxylin and eosin staining of formalin-fixed paraffin-embedded lymph node sections from *Rag2*$^{-/-}$ mice transferred with *Myc*$^{+}$*Ink4a/Arf*$^{-/-}$ CD4^{+} (left panels) or WT CD4^{+} T cells (right panels) at 21 days after adoptive transfer (*n* = 3). Scale bar, 1 mm (upper panels) or 100 μm (lower panels). (**c**) Spleen of *Rag2*$^{-/-}$ mice transferred with *Myc*$^{+}$*Ink4a/Arf*$^{-/-}$ CD4^{+} (left) compared with that of *Rag2*$^{-/-}$ mice transferred with WT CD4^{+} T cells (right). (**d**) Hematoxylin and eosin staining of formalin-fixed paraffin-embedded spleen sections from *Rag2*$^{-/-}$ mice transferred with *Myc*$^{+}$*Ink4a/Arf*$^{-/-}$ CD4^{+} (left panels) or WT CD4^{+} T cells (right panels) at 21

days after adoptive transfer (n = 3). Scale bar, 1 mm (upper panels) or 100 μm (lower panels). (**e**) Survival curve of *Rag2*$^{-/-}$ mice transferred with *Myc*$^{+}$*Ink4a/Arf*$^{-/-}$ CD4^{+} (n = 7) or WT (n = 6) CD4^{+} T cells. P = 0.0004 (log-rank test).

Supplementary Figure 5: Strategy for the analysis of human hair follicles.
Punch-biopsied scalp samples taken from normal human or subjects with CTCL were divided under a dissecting microscope into the four indicated levels. Single slide with sections from four different levels were prepared and analyzed for histology or immunohistochemistry.

Supplementary Figure 6: IL-7 and IL-7R expression in lesional CTCL skin.
H&E, IL-7, IL-7R or isotype control staining of lesional skin from three different CTCL patients (n = 3) and of normal humans (NHS) skin (n = 3). Scale bar, 100 μm.

Supplementary Table 1: List of primers utilized for real-time PCR.