# Expanded View Figures

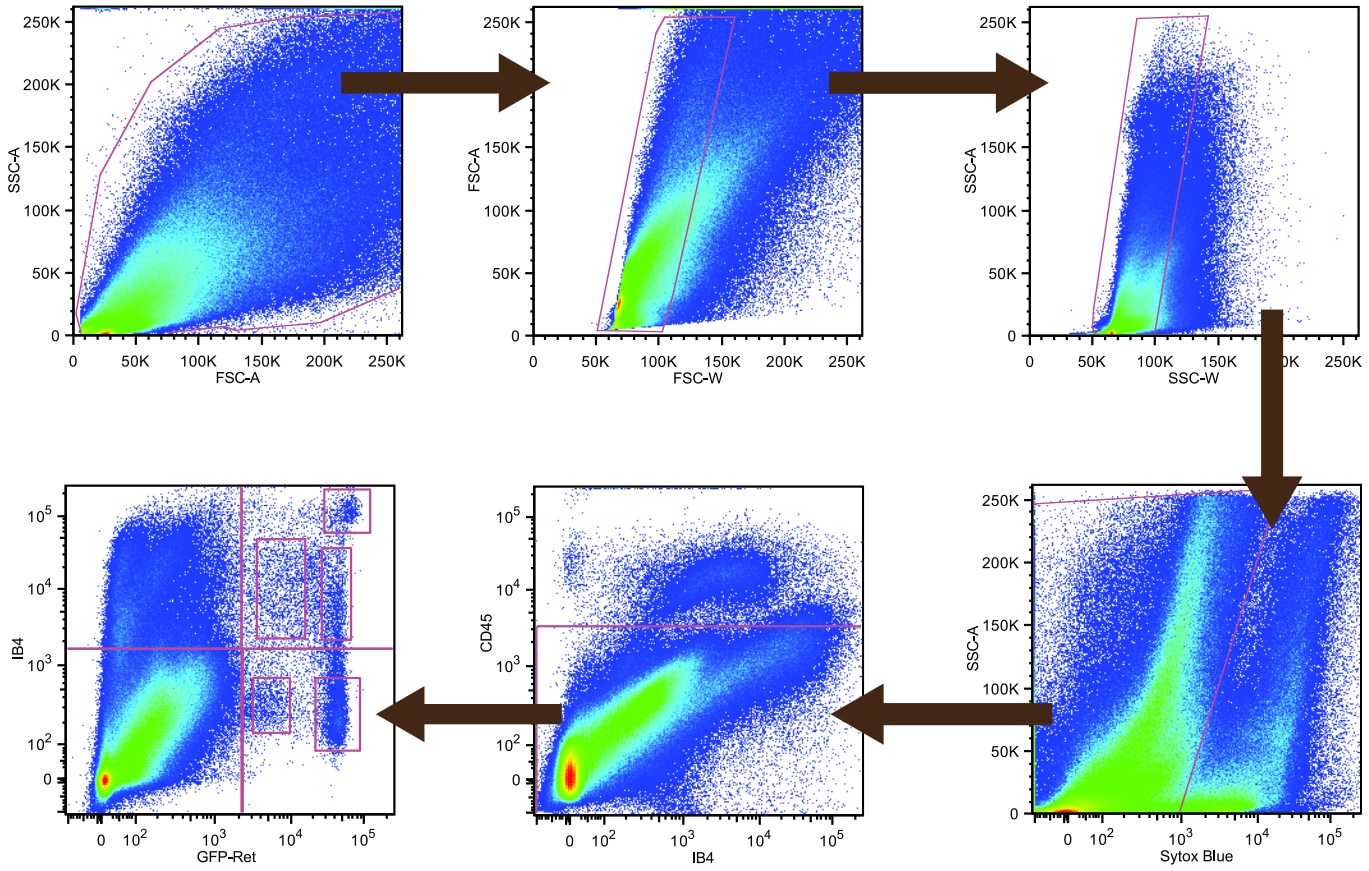



**Figure EV1. Avil-Cre::Ret$^{+/eGFP}$ DRG cell sorting strategy.**
Hierarchical gating strategy for the isolation of live Ret$^{+}$ sensory neurons. DRG cells were isolated from Avil-Cre::Ret$^{+/eGFP}$ mice, quantified, and selected according to their size and complexity. Dead cells and immune cells were excluded using the living dye Sytox Blue and an antibody against CD45. Live sensory neurons were defined by their levels of eGFP fluorescence and IB4 binding. The bottom left plot is identical to that in Fig 2A.

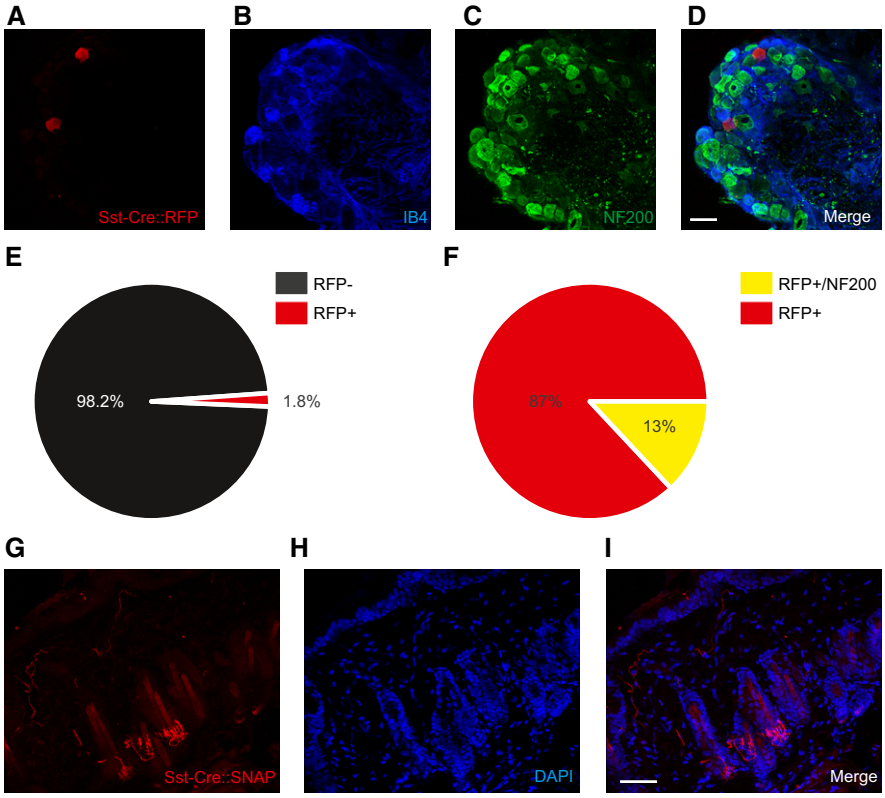
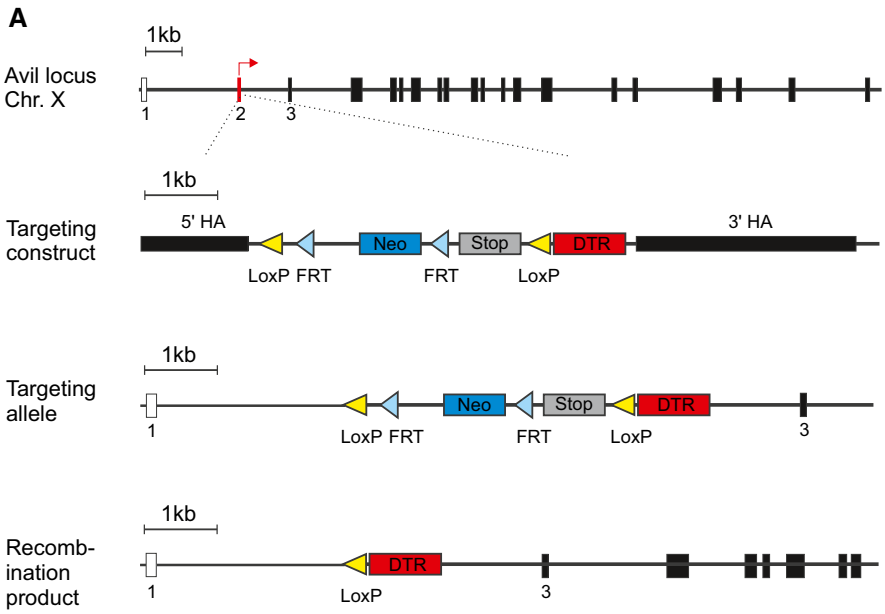



**Figure EV2. Sst-Cre::Rosa26-driven expression in sensory neurons.**

A–F $Sst^{Cre}$-mediated recombination of the *Rosa26* locus drives RFP expression in a small population of sensory neurons. Triple immunostaining of DRG from Sst-Cre::$Rosa26^{RFP/+}$ mice with RFP (A), IB4 (B), and NF200 (C). (E) Quantification of $Sst^{Cre}$:: $Rosa26^{RFP}$ expression in DRG. (F) Quantification of co-expression of $Sst^{Cre}$::$Rosa26^{RFP}$ with neuronal markers ($n$ = 2,592 cells from 3 mice). Scale bar, 50 μm.

G–I SNAP-tag labeling of skin from Sst-Cre::$Rosa26^{SNAPCaaX/+}$ mice. Hair follicle innervation, often occurring in 3 hairs together, is occasionally observed in skin from Sst-Cre::$Rosa26^{SNAPCaaX}$ mice. Scale bar, 50 μm.



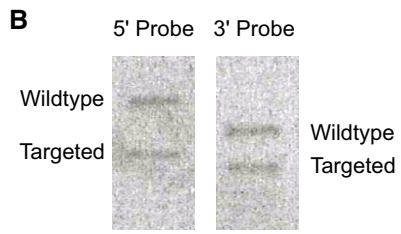




**Figure EV3. Generation of Avil$^{iDTR}$ mice.**

A Schematic diagram of the wild-type *Avil* locus with the Avil$^{iDTR}$ targeting construct, targeted allele, and recombination product.

B Southern blot of positive ES clone.

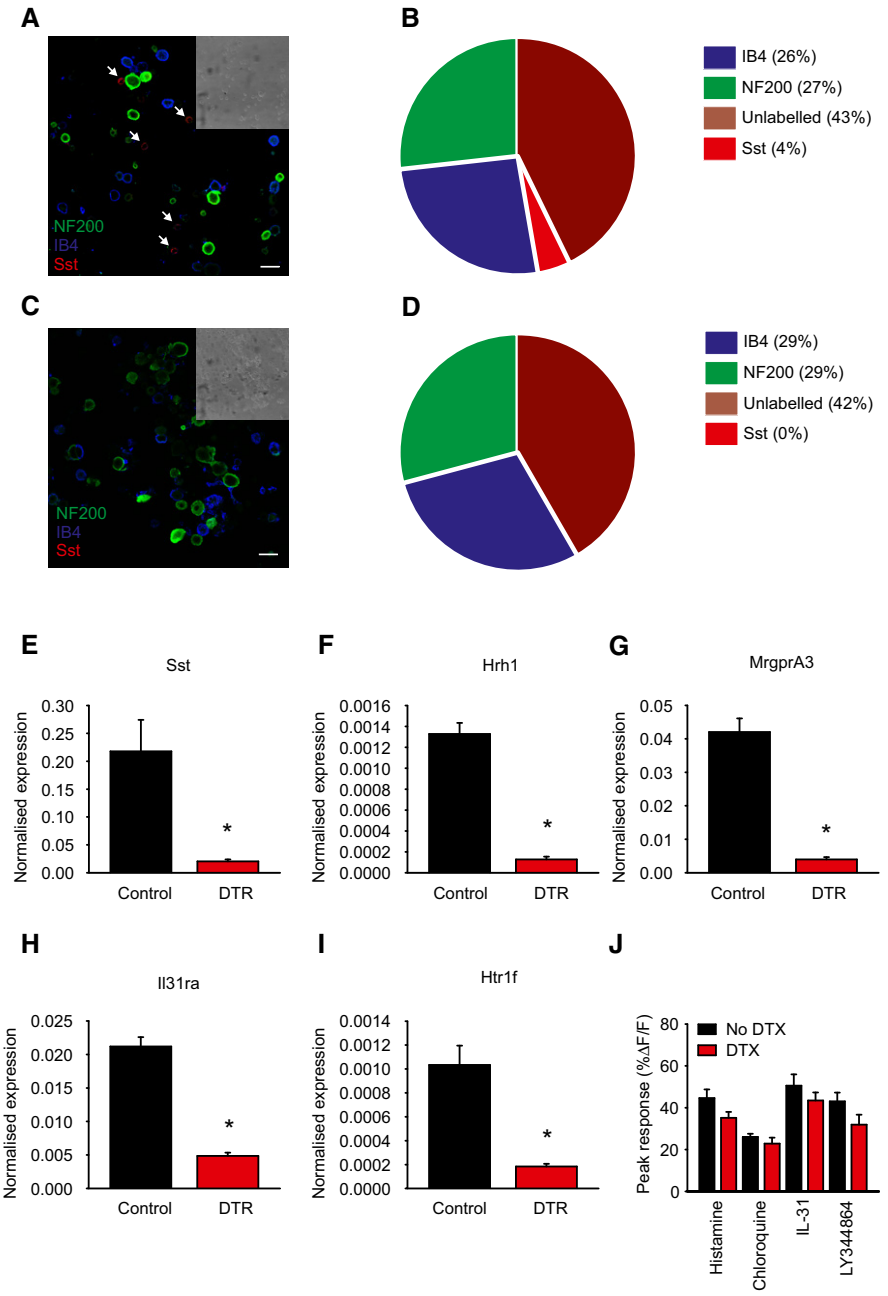



**Figure EV4. Characterization of Avil$^{iDTR}$ mice.**

A DRG neurons from control Avil$^{iDTR/+}$ mice treated with diphtheria toxin and labeled with antibodies against NF200, Sst, and IB4, and arrows indicate Sst positive. Mice were treated with diphtheria toxin as described below, and DRG cells were isolated, dissociated, and plated on glass coverslips before staining. Scale bar, 30 μm.

B Quantification of the number of NF200, Sst, IB4, and unlabeled neurons in control mice.

C Acutely dissociated DRG neurons from Sst-Cre::Avil$^{iDTR/+}$ mice treated with diphtheria toxin and labeled with antibodies against NF200 and Sst, and IB4. Scale bar, 30 μm.

D Quantification of the number of NF200, Sst, IB4, and unlabeled neurons in Sst-Cre::Avil$^{iDTR/+}$ mice after ablation.

E–I Quantitative RT–PCR for the indicated transcripts (Sst, Hrh1, MrgprA3, Il31ra, Htr1f) in DRG from control Avil$^{iDTR}$ and Sst-Cre::Avil$^{iDTR}$ mice treated with diphtheria toxin. Values are normalized to ubiquitin levels. Error bars indicate SEM, and asterisk indicates $P < 0.05$, $n = 3$.

J Peak calcium flux to the indicated pruritogen in Sst-Cre::Avil$^{iDTR}$ mice treated with vehicle or diphtheria toxin, $n = 4$–6 mice. Asterisk denotes $P < 0.05$, $t$-test, and error bars indicate SEM.

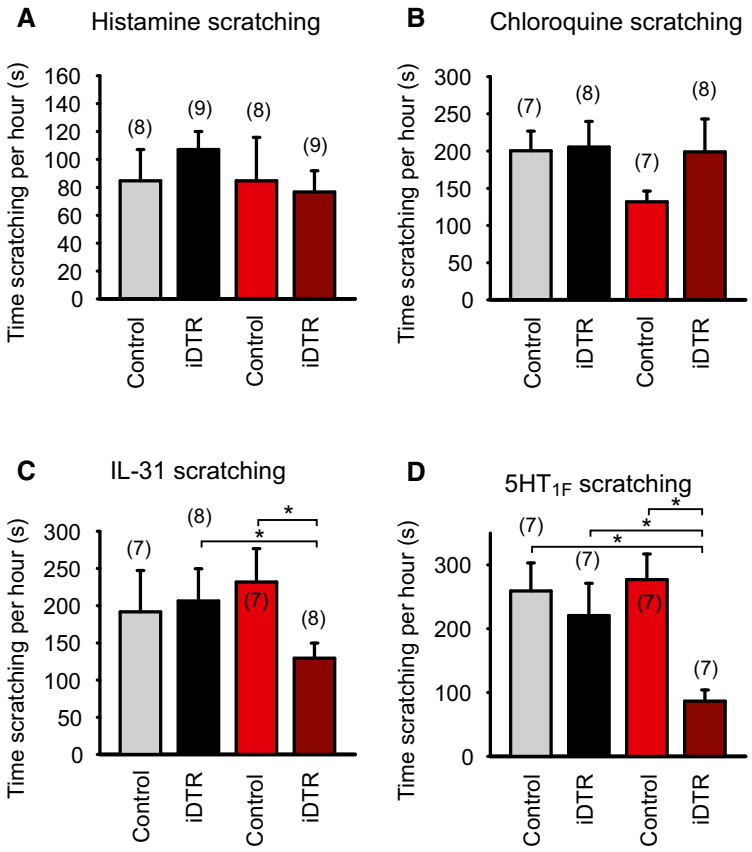



**Figure EV5. Scratching times in Sst-Cre::Avil$^{iDTR}$ mice after diphtheria toxin-mediated ablation.**

A–D Time spent scratching after a single intradermal injection of the indicated pruritogen observed for 1 h. All compounds evoked a significant increase in the time of scratching compared to vehicle alone in control (Avil$^{iDTR}$) or Sst-Cre::Avil$^{iDTR}$ mice. Diphtheria toxin injection in control mice (Avil$^{iDTR}$) had no effect on scratching time evoked by histamine (A), chloroquine (B), IL-31 (C), or 5HT$_{1F}$ agonist Ly344864 (D) but significantly reduced responses to histamine, IL-31, or Ly344864 in Sst-Cre::Avil$^{iDTR}$ mice. *n* numbers indicated above bars, and asterisk denotes $P < 0.05$, two-way RM ANOVA, Holm–Sidak multiple comparison, and error bars indicate SEM.