

SUPPLEMENTARY MATERIALSupplementary Methods

To test whether conventional mouse diet (containing alfalfa) created background signal in the mouse alimentary tract, a *Hairless*^{SKH1/SKH1} mouse on regular mouse diet as well as regular mouse diet pellets (with alfalfa) and purified mouse diet pellets were scanned at aforementioned Xenogen IVIS Spectrum settings for MMPsense imaging (see Materials and Methods for Multiplex live animal imaging in the main body of the manuscript) at an excitation wavelength of 680 nm and an emission wavelength of 720 nm (corresponding to MMPsense 680).

Supplementary Table S1. Hematological Assessment of *Hairless*^{SKH1/SKH1} Mice by Charles River Laboratories. Five SKH1 mice (sexes not specified) ages 180 – 240 days and 68 C57Bl/6 mice (34 males and 34 females) ages 56 – 70 days were evaluated. Statistical approaches are described in the methods section (note: although data are presented in terms of means and standard deviations, the Wilcoxon rank-sum test was applied for analysis). Values in **bold** indicate indices exhibiting significant differences between C57Bl/6 and *Hairless* mice for the current study (Table 1). Except for mean corpuscular hemoglobin, trends are not the same between the studies and may represent biological variability or sample size considerations. n.d., not determined.

	C57Bl/6		<i>Hairless</i> ^{SKH1/SKH1}		
	Mean	Std. Dev	Mean	Std. Dev	
White blood cell count (x10 ³ cells/μl)	8.42	2.605	9.26	1.81	
Lymphocyte count (x10 ³ cells/μl)	7.22	2.28	5.71	1.33	
Monocyte count (x10 ³ cells/μl)	0.09	0.045	0.57	0.18	
(% lymphocytes)	n.d.	n.d.	61.52	6.91	
(% monocytes)	n.d.	n.d.	6.06	1.34	
Red blood cell count (x10 ⁶ cells/μl)	9.94	0.30	9.37	0.37	
Hematocrit	56.77	2.13	49.44	2.24	(p=0.02)
Mean corpuscular volume (fL)	57.17	1.56	53.9	2.42	(p=0.004)
Mean corpuscular hemoglobin (pg)	15.79	0.43	17.1	0.4	(p=0.005)
Mean corpuscular hemoglobin concentration (g/dL)	27.63	0.50	31.74	0.98	
Red blood cell distribution width	13.89	0.89	16.38	0.35	(p=0.004)
Platelet (x10 ³ cells/μl)	1255.48	109.63	1484	280	
Mean platelet volume (fL)	6.82	0.4	4.6	0.14	

SUPPLEMENTARY FIGURE LEGENDS

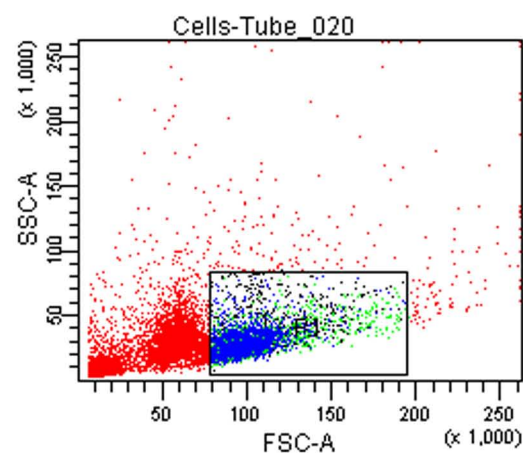
Supplementary Figure S1. Strategy for Immunophenotyping by Flow Cytometry. (A to C) Spleen. (D to F) Thymus. See Methods for additional details.

Supplementary Figure S2. Alveolar Rhabdomyosarcoma Tumor Growth Rates of mice with 0, 1 or 2 SKH1 mutations at the *Hr* locus (n=8, n=10 and n=6, respectively). Overlaid solid quadratic curves are based on a repeated measures linear model of tumor volume in terms of group (WT/WT, SKH1/WT, SKH1/SKH1), time, the group by time interaction, and the group by time² interaction, with an auto-regressive (1) covariance structure; dots indicate group means and dashed lines connect consecutive means within groups. The interactions of time by WT/WT group is not significantly different from the SKH1/SKH1 ($p=0.95$) group and the interaction of time by SKH1/WT group is different from the SKH1/SKH1 group ($p=0.01$).

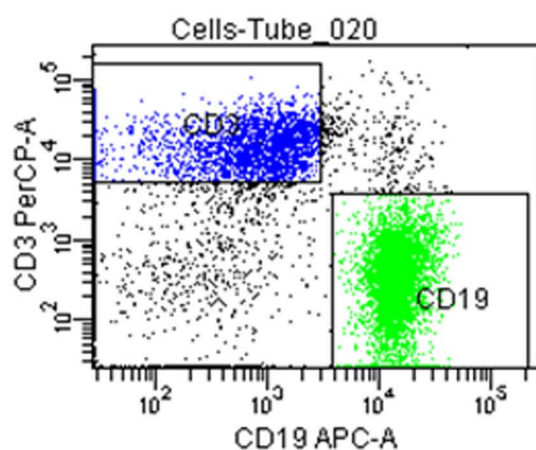
Supplementary Figure S3. Autofluorescence from regular mouse diet. (A) Fluorescence scan showing whole body image of a mouse on regular mouse diet (with alfalfa). Scale bar: 1.18×10^9 to 7×10^9 photons/s/cm²/steradian. (B) Fluorescence scan of mouse diet pellets. Left, regular diet chow with alfalfa. Right, purified diet chow without alfalfa. Scale bar: 6.3×10^9 to 3.5×10^{10} photons/s/cm²/steradian.

Supplementary Figure S1

A



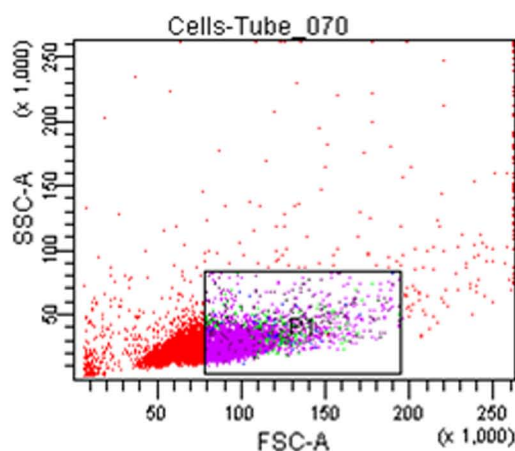
B



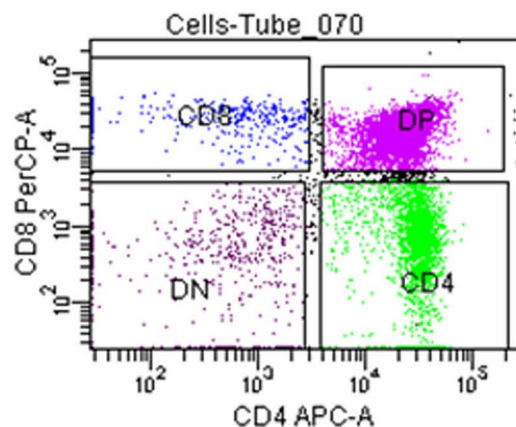
C

Tube: Tube_020			
Population	#Events	%Parent	%Total
All Events	97,722	####	100.0
P1	47,654	48.8	48.8
CD19	24,845	52.1	25.4
CD3	16,074	33.7	16.4

D



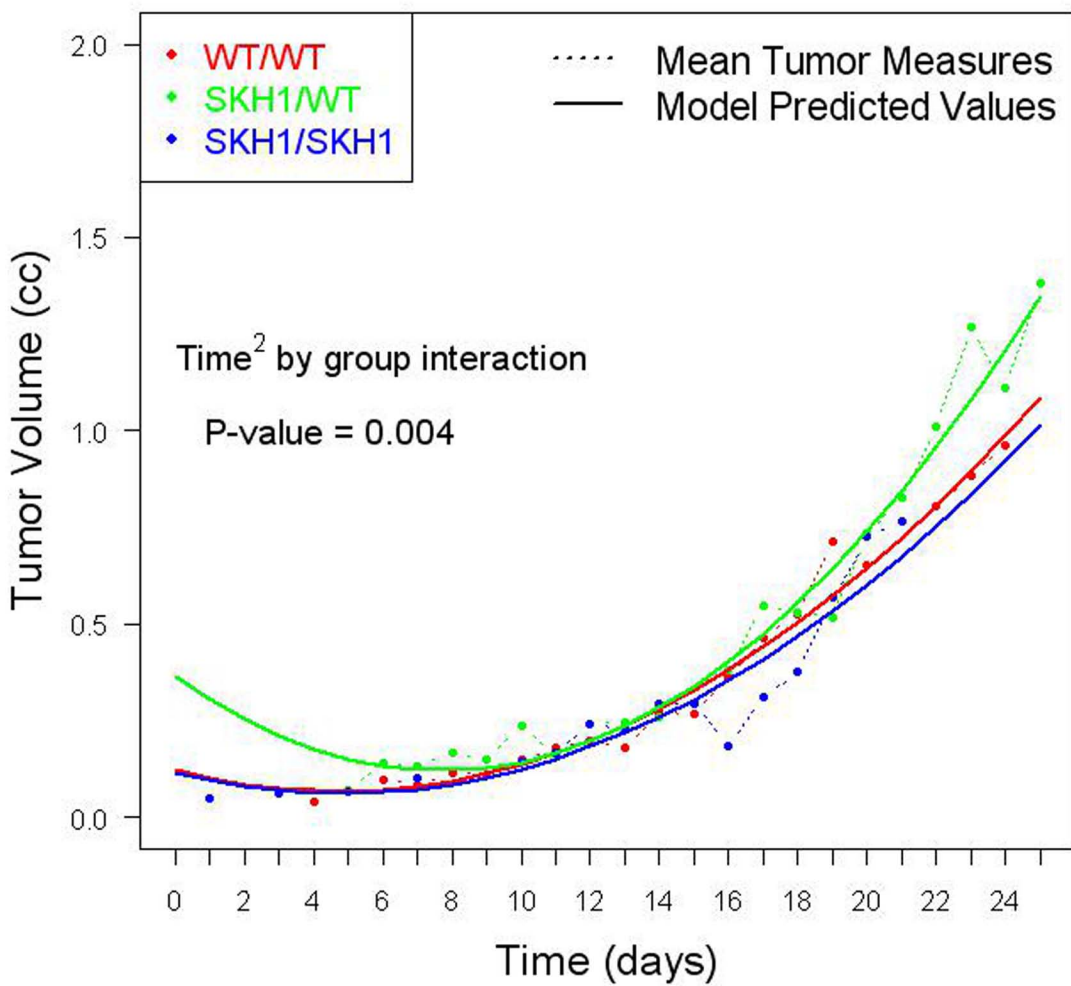
E



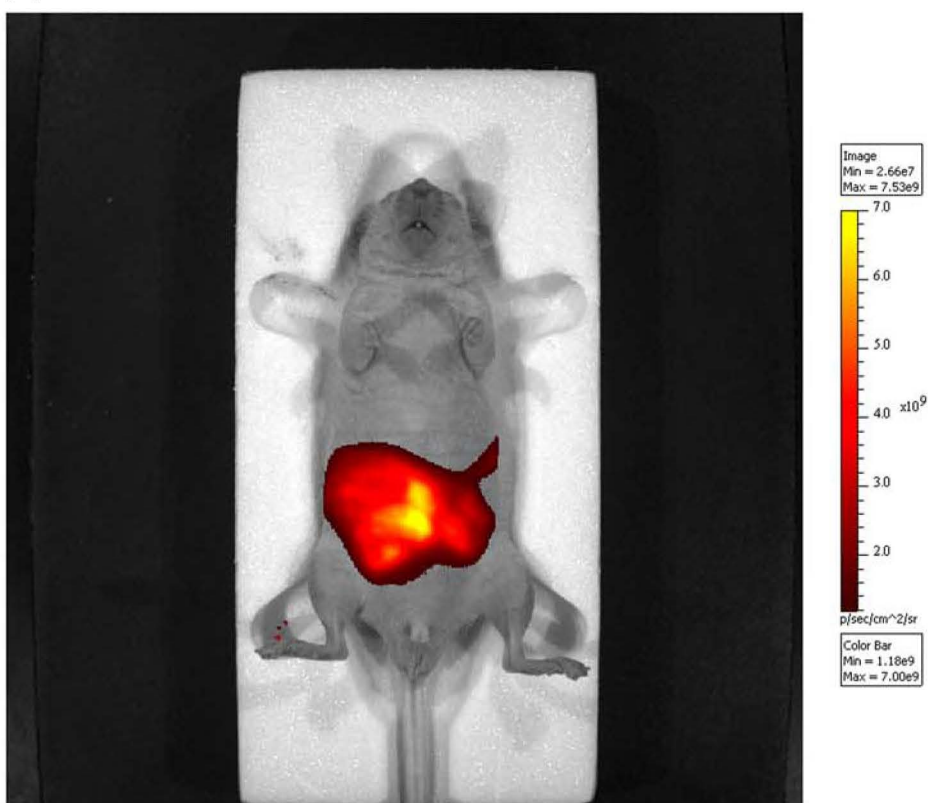
F

Tube: Tube_070			
Population	#Events	%Parent	%Total
All Events	107,874	####	100.0
P1	46,037	42.7	42.7
CD4	10,074	21.9	9.3
CD8	1,784	3.9	1.7
DP	30,945	67.2	28.7
DN	2,168	4.7	2.0

Supplementary Figure 2



A



B

