Supplementary Materials and Methods

Mice and Reagents

The generation of Pias1<sup>−/−</sup> mice has been described (Liu et al., 2004). C57SJL (CD45.1) mice were purchased from the Jackson Labs.

The following antibodies were purchased from BioLegend: fluorescein isothiocyanate (FITC)-conjugated anti-IgM (RMM-1), anti-Mac1 (CD11b; M1/70), anti-CD3 (145-2C11), anti-CD4 (RM4-5), anti-Sca1 (D7); phycoerythrin (PE)-conjugated anti-B220 (CD45R; RA3-6B2), anti-GR1 (Ly-6G/Ly-6C; RB6-8C5), anti-Mac1 (M1/70), anti-CD11c (N418), anti-Ter119 (TER119), anti-NK-1.1 (PE136), anti-CD5 (53-7.3), anti-CD8a (53-6.7), anti-IL7Ra (CD127; SB/199); Alexa Fluor 647-conjugated anti-IL7Ra (CD127; SB/199); allophycocyanin (APC)-conjugated anti-FCgRII/III (CD16/32; 93), anti-CD45.2 (104); PE/Cy7-conjugated anti-FCgRII/III (CD16/32; 93); PerCP-conjugated anti-CD45.1 (A20); PE/Cy5-conjugated anti-Sca1 (D7), anti-CD34 (MEC14.7); APC-conjugated anti-c-Kit (2B8); and isotype controls. PE-conjugated anti-CD4 (GK1.5) and Alexa Fluor 488-conjugated anti-Ki67 (B56) are from BD Pharmingen. APC-conjugated anti-CD150 (mShad150) is from eBioscience.

Flow cytometry analysis and sorting of HSC and progenitors

Various cell populations are defined as the following: common lymphoid progenitors (CLP): Lin<sup>−</sup> Sca1<sup>low</sup> c-Kit<sup>low</sup> IL7Ra<sup>+</sup>; common myeloid progenitors (CMP): Lin<sup>−</sup> Sca1<sup>−</sup> c-Kit<sup>+</sup> CD34<sup>+</sup> FcgRII/III<sup>low</sup>; granulocyte monocyte progenitors (GMP): Lin<sup>−</sup> Sca1<sup>−</sup> c-Kit<sup>+</sup> CD34<sup>+</sup> FcgRII/III<sup>+</sup> CD34<sup>−</sup> FcgRII/III<sup>−</sup>; megakaryocyte erythrocyte progenitors (MEP): Lin<sup>−</sup> Sca1<sup>−</sup> c-Kit<sup>−</sup> CD34<sup>−</sup> FcgRII/III<sup>+</sup>; Pre-B, Lin IgM B220<sup>+</sup> CD43<sup>+</sup>; Pro-B, Lin IgM B220<sup>+</sup> CD43<sup>−</sup>; Pre-B, Lin IgM B220<sup>+</sup> CD43<sup>+</sup>; LSK: Lin<sup>−</sup> Sca1<sup>−</sup> c-Kit<sup>−</sup> CD34<sup>+</sup> and short-term multi-potent progenitors (ST/MPP): Lin<sup>−</sup> Sca1<sup>−</sup> c-Kit<sup>−</sup> CD34<sup>+</sup>. Dormant hematopoietic stem cells (d-HSC) are defined as Lin<sup>−</sup> Sca1<sup>−</sup> c-Kit<sup>−</sup> CD34<sup>−</sup> CD48<sup>+</sup> CD150<sup>−</sup>. Lineage markers include CD3, CD4, CD5, CD8a, B220, GR1, Mac1 and Ter119, except that only CD3, CD4, CD8a and GR1 were used for Pro-B and Pre-B populations.

Short term competitive reconstitution assays

Short term competitive reconstitution assays were performed as described with slight modifications (Yang et al., 2005). Briefly, FACS-sorted myeloid-restricted Lin<sup>−</sup> Sca1<sup>−</sup> c-Kit<sup>−</sup> (L<sup>−</sup> S<sup>−</sup> K<sup>−</sup>) cells (10,000) from WT or Pias1<sup>−/−</sup> littermates (CD45.2<sup>+</sup>) were mixed with 2x10<sup>5</sup> of WT C57SJL bone marrow (BM) cells (CD45.1<sup>+</sup>) and injected into lethally irradiated WT C57SJL mice. The percentage of myeloid cells (Mac1<sup>+</sup>) from donor mice in peripheral blood (PBL), BM and spleen were assayed by flow cytometry 13 days post reconstitution.

Primer sequences

The following primers for murine genes are used for Q-PCR:

Hprt1-f: 5’- CAGTACAGCCCCAAAAATGTT
Hprt1-r: 3’- CAAGGGCATATCCAACAACA
Gata1-f: 5'-- AGCAACGGCTACTCCACTGT  
Gata1-r: 5'-- TGCTGACAATCATTCGCTTC

Gata2-f: 5'-- GATAACCACCTATCCCTCTATGTG  
Gata2-r: 3'-- GTGGCACCACAGTGACACACTC

Csflr-f: 5'-- CTTTGGTCTGGGCAAGAGAT  
Csflr-r: 5'-- CAGGCGCTCTCTCTCATCAG

Mpo-f: 5'-- GTTCCCGCTGAACACATCAG  
Mpo-r: 5'-- ATTCAGTTTGGCTGGGAGTG

Cebpa-f: 5'-- CAAGAACAGCAACGAGTACCG  
Cebpa-r: 3'-- GTCACTGGTACAACCTCACGC

Ikzf1-f: 5'-- CAAAGCAGATGCGAGAGA  
Ikzf1-r: 3'-- CGAGACGCCACTTGTCTCCA

Gata3-f: 5'-- CTACCAGGTTGGGATGTGAAGC  
Gata3-r: 5'-- GTTCACACACTCCCTGCTCTTCT

Il7r-f: 5'-- TGGCTCTGGGTAGAGCTTTC  
Il7r-r: 5'-- GTGGCACCAGAAGGAGTGAT

Ebf1-f: 5'-- CGGAAATCCAACTTCTTCCA  
Ebf1-r: 5'-- GTCTTTTCGCTGTTGGCTTC

Pax5-f: 5'-- AACTTGCCCATCAAGGTGTC  
Pax5-r: 5'-- GGCTTGATGCTTCCTGTCTC

Igll1-f: 5'-- GAGCTTCAGTGGGAAGCAAC  
Igll1-r: 5'-- CCCACCACAAAGACATACC

Epor-f: 5'-- TGTCTCCTACTTGCTGGGGC  
Epor-r: 5'-- CAAGCGTTGGGCTGGAGC

Hbb-b1-f: 5'-- AACGATGGCCTGAATCACTT  
Hbb-b1-r: 5'-- ACGATCATATTGCCAGAG

Slc4a1-f: 5'-- CCTCATCCTACAGTGCTGGGC  
Slc4a1-r: 5'-- CAGGCCATTCTCCTGCTAC

Pias1-f: 5'-- CATCAACACCTCCCTCATCC  
Pias1-r: 5'-- CCTCTGCACCTAGCTGGTC

The following primers are used for bisulfite sequencing:
The following primers are used for Chromatin immunoprecipitation (ChIP):

**Gata1** promoter-f: 5' - ACCTGCAAATGGTACAGC
**Gata1** promoter-r: 5' - TTCAGTGAGAACGAGCCCTA