Supplementary Figure 1:

(A) The caspase-1 immunoblot analysis in thymus during aging. The caspase-1 p20 form was detected using fluorescently conjugated secondary anti-rat antibody. The membranes were images for fluorescence using Odyssey Infrared Imaging System. (**B**) The thymocytes ($CD45^+CD11c$-), thymic myeloid cells ($CD45^+CD11c^+$) and thymic stromal cells ($CD45^-CD11c^-$) from 1 and 9 month old mice (n = 6 each, repeated twice, $P<0.05$) were sorted using FACS. The total RNA was used for real-time PCR analysis of IL-18. The mRNA expression was normalized to *Gapdh* and shown as relative expression ($\Delta\Delta Ct$). (**C**) The cholesterol ester content in the thymi of 1m and 12m old C57/B6 mice (n = 6/group) was measured using GLC. (**D**) The thymic cryosections from 1month and 24month old C57/B6 mice (n = 3) were stained with macrophage marker CD11b and filipin that binds to free cholesterol. The nuclei were counterstained with propidium iodide (red). The confocal immofluorescence analysis shows co-localization of macrophages with free cholesterol in medullary area of thymus (indicated by white line). (**E**) The free cholesterol (FC) and cholesterol ester (CE) levels in the BMDMs (from WT and *Nlrp3*$^{-/-}$ mice) treated with LPS and loaded with loaded with methyl-β cyclodextrin-cholesterol (cholesterol concentration: 80mg/ml).

Supplementary Figure 2:

(**A**) The representative confocal immunofluorescence analysis of thymic cryosections from 23 month old WT mice stained with anti-ceramide antibody conjugated to Alexa Fluor 488 (green) and antiCD11b conjugated with Alexa Fluor 594 (red). Nuclei were counterstained with DAPI in blue. Colocalization of ceramides in macrophages is evident as yellow. (**B**) The thymic cryosections were immunolabelled with anti-ceramide and macrophage marker F4/80 (red) Nuclei were labelled with DAPI. The magnification of thymic medullary region (60X) is shown to highlight co-localization of ceramide in $CD11b^+$ and F4/80 expressing cells. The medullary areas are marked by white line.

Supplementary Figure 3:

(A) The quantification of caspase-1 (immunoblots of figure 2A, B) and (**B**) IL-1β p17. The specific western blot band intensities were analyzed using ImageJ and arbitrary units were normalized to housekeeping controls and expressed as fold change. (**C**) The thymi (n = 3) from 1.5 month old WT, *Nlrp3*$^{-/-}$ and *Asc3*$^{-/-}$ mice were enzymatically digested and stained with CD45, EpCAM, Ly5.1 and MHC-II. The cTEC and mTEC subpopulations gated on CD45^{-}EpCAM^{+} are shown. No differences were detected in the frequency of TEC cells in young WT and *Nlrp3*$^{-/-}$ and *Asc3*$^{-/-}$ mice.

Supplementary Figure 4:

(A) Thymic size of 9 month and 24 – month old WT, *Nlrp3*$^{-/-}$ and *Asc*$^{-/-}$ animals. (**B**) Thymic weights of WT, *Nlrp3*$^{-/-}$ and *Asc*$^{-/-}$ mice at 1, 9, 18 and 23 months of age. (n = 8-12/age group). All data are presented as means ± SEM, $*P < 0.05$.

Supplementary Figure 5:

(A) The splenocytes were stained with CD4, CD8, CD62L and CD44 to identify naïve (CD4/CD8^{-} CD62L^{+}CD44^{-}) and E/M (CD4/CD8^{-}CD62L^{+}CD44^{-}) T cells. The representative FACS dot plots from 1month old WT, and *Nlrp3*$^{-/-}$ mice are shown. (**B**) The splenic T cells derived from 18 month old WT, *Nlrp3*$^{-/-}$ and *Asc*$^{-/-}$ mice were stimulated by plate bound anti-CD3 and CD28 antibodies to mimic TCR ligation and cell growth/proliferation was measured using MTT assay. All data are presented as means ± SEM, $*P < 0.05$ (n = 4-6/group).

Supplementary Figure 6:

The TCR spectratyping analysis of peripheral CD4^{+} cells of 23 month old WT, *Nlrp3*$^{-/}$ and *Asc*$^{-/-}$ mice. The representative Vβ results of CDR3 size analysis show Gaussian distribution and greater

number of individual peaks in *Nlrp3*$^{-/-}$ and *Asc*$^{-/-}$ mice. The X axis is CDR3 size and Y axis is mean fluorescence intensity (MFI).

Supplementary Figure 7:

(**A**) The representative FACS dot plots (for Figure 6D) of thymocyte subsets of 1 and 9 month old WT and *Nlrp3*$^{-/-}$ mice 2 weeks after irradiation and BMT. The CD4 SP, CD8SP, and DP cells are gated on donor (CD45.1) and host (CD45.2) cells. (**B**) The representative FACS plots (for Figure 6E) of thymocytes stained with Annexin-V and gated on donor (CD45.1) and host (CD45.2) cells of 1 and 9 month old WT and *Nlrp3*$^{-/-}$ mice 2 weeks after irradiation and BMT.