(Polysciences, Warrington, PA). The size of each spot was measured with Zeiss KS ELISPOT software (Oberkochen, Germany).

***In vitro* culture.** $CD11b^+$ IgA^+ or $CD11b^-IgA^+$ PCs (10^4 cells per well) were purified from the iLP and cultured with 100 ng ml^{-1} phorbol 12-myristate 13-acetate plus 300 ng ml^{-1} ionomycin, or 10 μg ml^{-1} lipopolysaccharide (all from Sigma-Aldrich), for 24 h.

For the bacteria uptake assay, fluorescent *Staphylococcus aureus* was opsonized in accordance with the manufacturer's protocol (Molecular Probes). Mononuclear cells isolated from the iLP (2×10^5 cells) were incubated with 1×10^5 opsonized bacteria for 90 min. After being washed, the cells were stained with antibodies for PE-IgA (mA-6E1, 0.5 μg ml^{-1}, eBioscience) and Pacific Blue CD11b, and the bacterial uptake by each population was examined by flow cytometry.

Microarray analysis. Microarray analysis was performed as we previously reported[47]. Briefly, $CD11b^+$ IgA^+ and $CD11b^-$ IgA^+ cells were isolated from the iLP, and total RNA was extracted from them with an RNeasy kit (Qiagen, Dusseldorf, Germany). cRNA was hybridized with DNA probes on a GeneChip Mouse Genome 430 2.0 array (Affymetrix), washed and fluorescence-labelled in accordance with the standard amplification protocol developed by Affymetrix. The fluorescence intensity of each probe was taken to represent the raw expression level and was quantified with GeneChip Operating software (Affymetrix). Data obtained from two independent experiments were analysed with GeneSpring 7.3.1 software (Silicon Genetics). All microarray data have been deposited in the National Center for Biotechnology Information Gene Expression Omnibus database (www.ncbi.nlm.nih.gov/geo/) under the accession no. GSE37225.

Statistics. Results were compared by a non-parametric Mann–Whitney's *U*-test and unpaired *t*-test (two tailed) (GraphPad Software, San Diego, CA).

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Author contributions

J.K. planned the research and experiments, analysed data, wrote the paper and directed the research; M.G., E.H., I.I., M.H., Y.S., Y.G., C.P., I.I.I., R.S., L.A., T.W., S.S., Y.K. and S.S. conducted the immunological experiments; K.T. and S.A. provided key materials; and H.K. wrote the paper.

Additional information

Accession codes: Microarray data have been deposited in the National Center for Biotechnology Information Gene Expression Omnibus database under series accession code GSE37225.

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