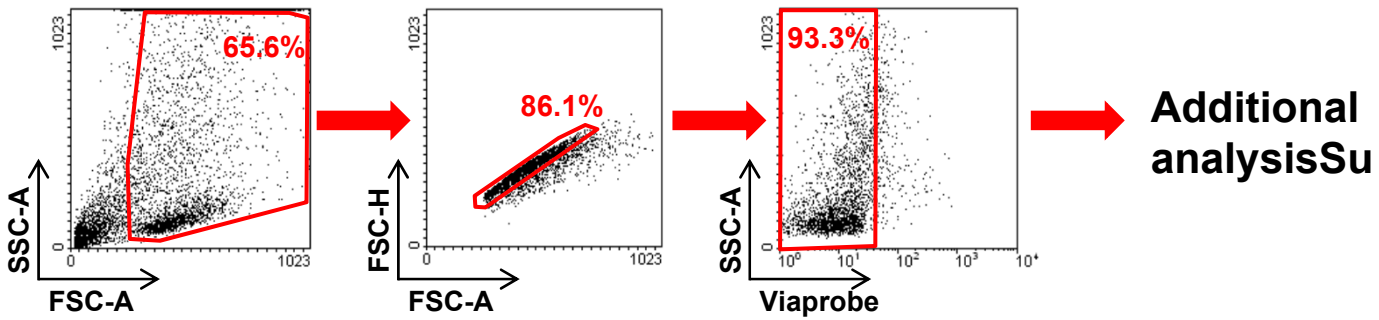
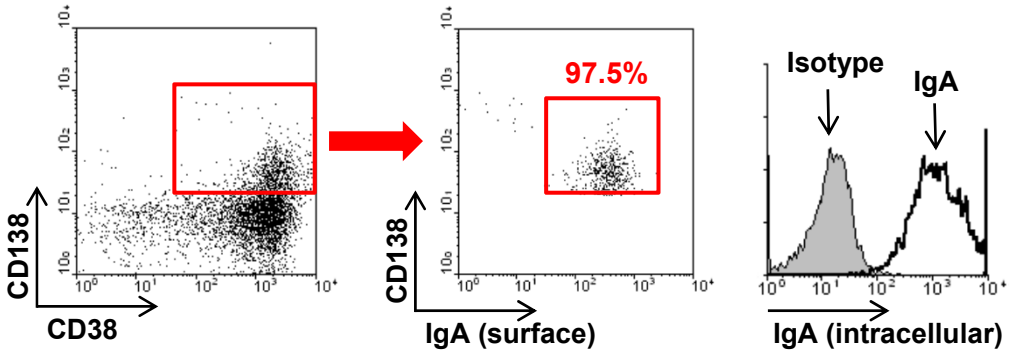
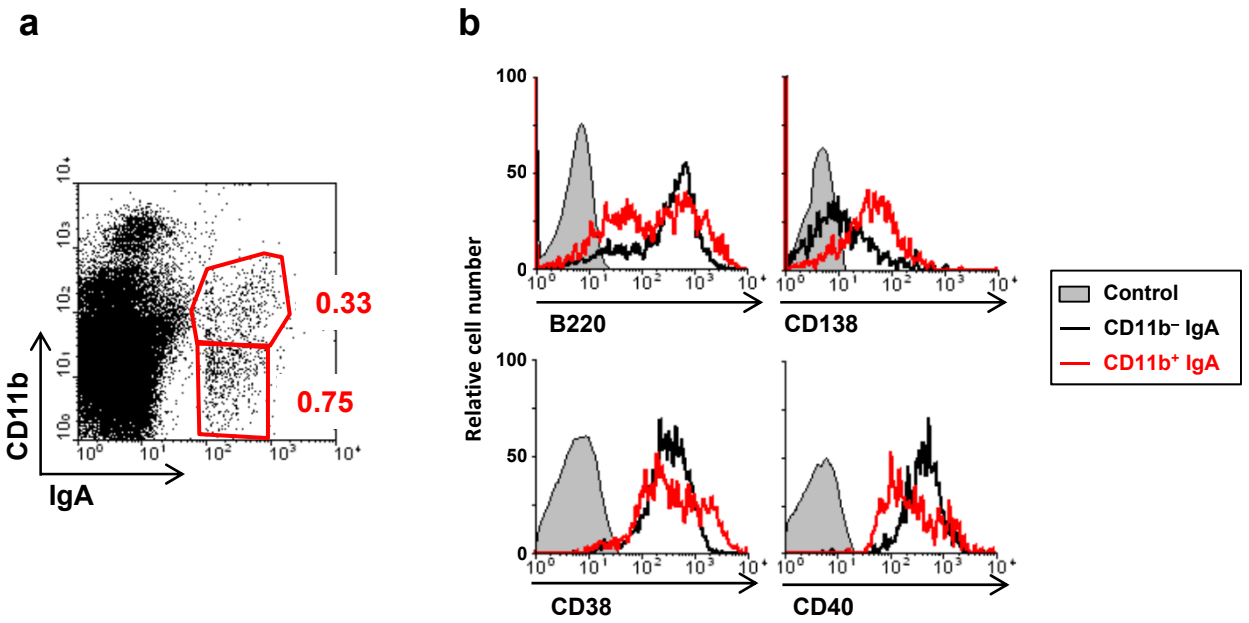


Supplementary Figure S1. Gating strategy for flow cytometry
Doublet cells were discriminated by FSC-A/SSC-A and FSC-A/FSC-H and Viaprobe was used to detect dead cells. Viaprobe$^-$ singlet cells were used for additional analysis.



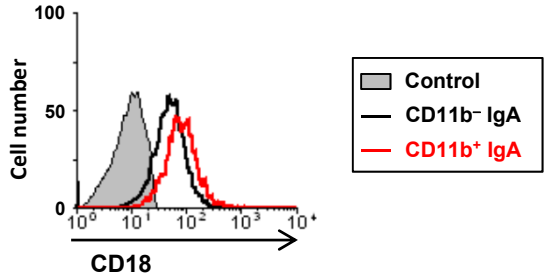
Supplementary Figure S2. Surface and intracellular IgA expression in CD38$^+$ CD138$^+$ cells in the intestine

Flow cytometry was performed to examine IgA expression on the surface and intracellular compartment of CD38$^+$ CD138$^+$ cells in the intestine.



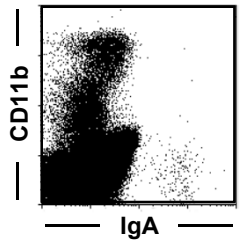
Supplementary Figure S3. Spleen IgA$^+$ cells are composed of several kinds of cells showing different differentiation phenotypes

Cells were isolated from the spleen for the analysis of IgA and CD11b expression (**a**), B220, CD138, CD38, CD40 expression on CD11b$^-$ IgA$^+$ (black) and CD11b$^+$ IgA$^+$ (red) cells (**b**). Gray indicates isotype control Ab. Similar results were obtained from three separate experiments.

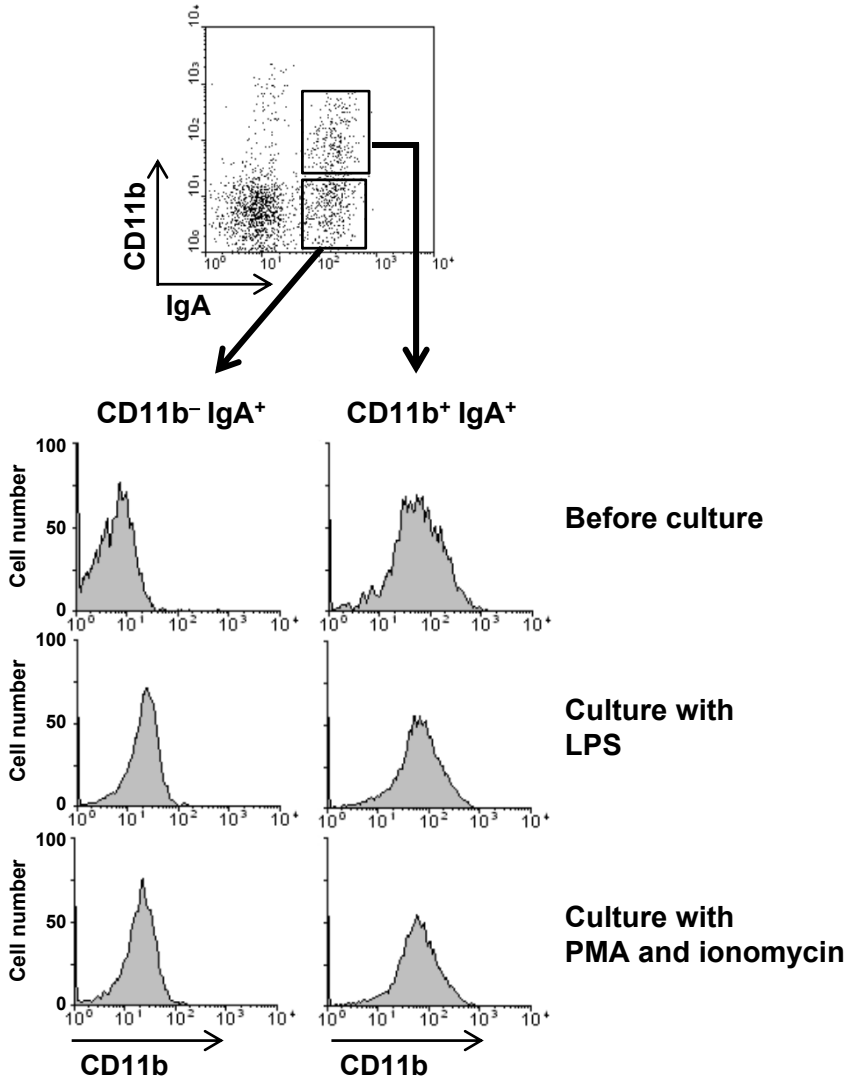


Supplementary Figure S4. CD18 expression on IgA plasma cells in the intestine

The expression of CD18 was examined on IgA^+ $CD11b^+$ (red) and IgA^+ $CD11b^-$ (black) cells isolated from the intestinal lamina propria of wild-type mice. Shadow indicates isotype control Ab. Data are representative of three separate experiments.

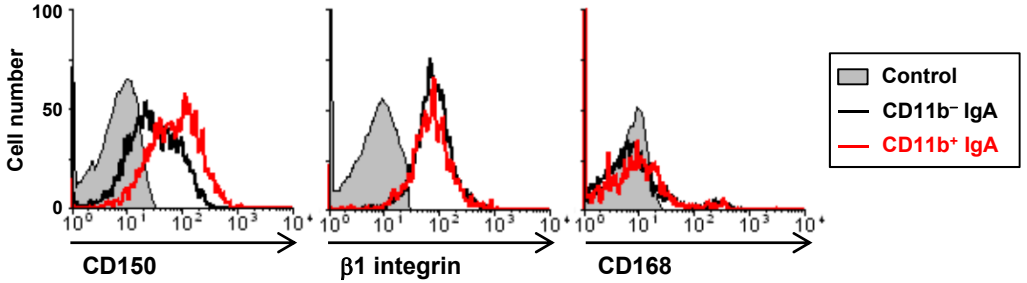


Supplementary Figure S5. Lack the CD11b expression in the intestine after adoptive transfer of peritoneal CD11b$^+$ B cells
CD11b$^+$ B220$^+$ B cells were purified from the peritoneal cavity and adoptively transferred into severe combined immunodeficiency mice. Two months later, CD11b$^+$ IgA$^+$ cells were isolated from the intestinal lamina propria for examination. Similar results were obtained from four individual mice.



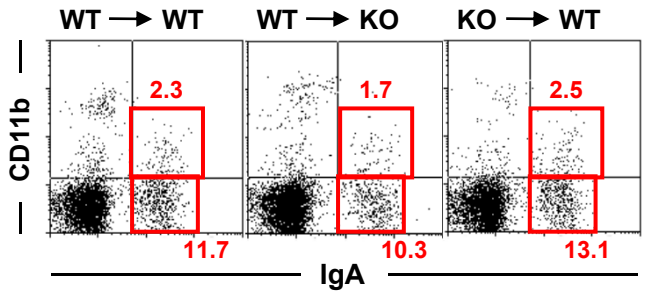
Supplementary Figure S6. Maintained expression of CD11b on IgA⁺ cells after in vitro culture

$CD11b^-$ and $CD11b^+$ IgA^+ cells were purified by cell sorting from the intestinal lamina propria and used for in vitro culture with lipopolysaccharide (LPS) or phorbol 12-myristate 13-acetate (PMA) plus ionomycin. Twenty four hours after incubation, CD11b expression was examined by flow cytometry. The data is representative from five separate experiments.



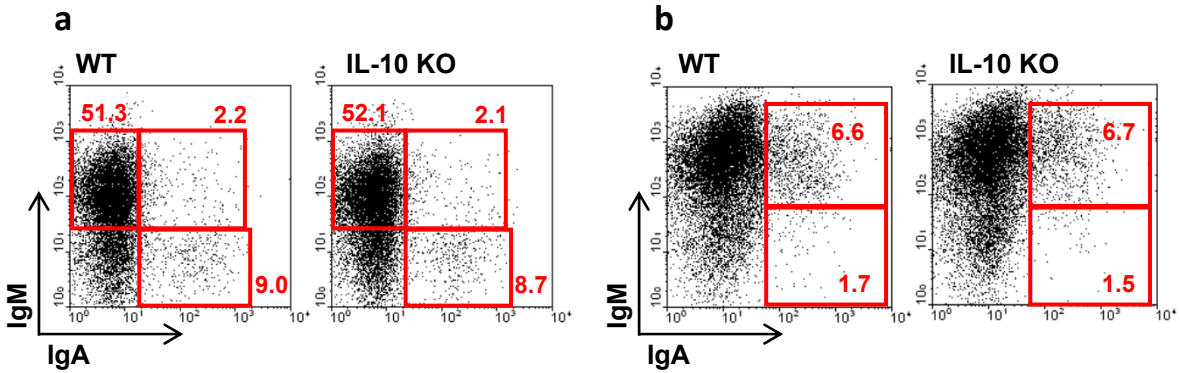
Supplementary Figure S7. Expression profiles of CD150, β1 integrin, and CD168 on IgA plasma cells in the intestine

The expression of CD150, β1 integrin, and CD168 was examined on IgA^+ $CD11b^+$ (red) and IgA^+ $CD11b^-$ (black) cells isolated from the intestinal lamina propria of wild-type mice. Shadow indicates isotype control Ab. Data are representative of three separate experiments.



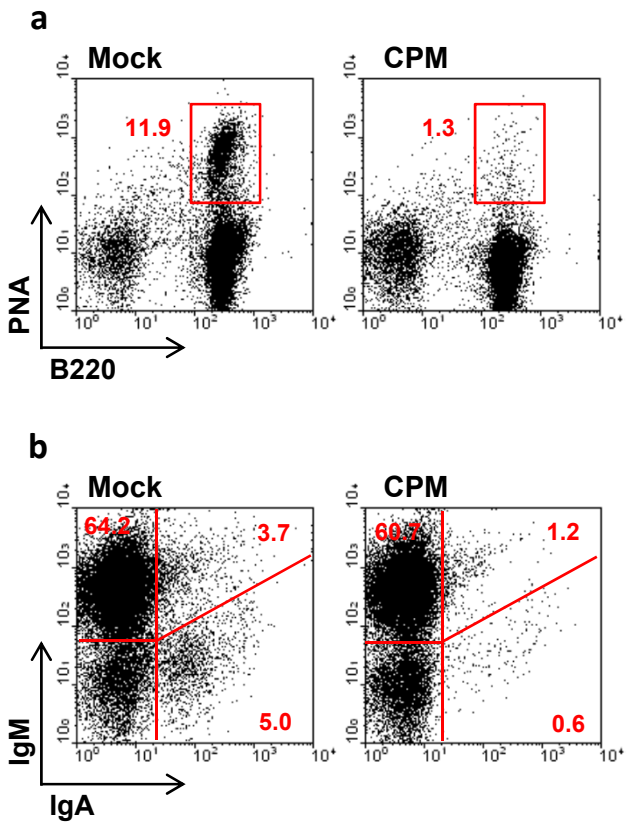
Supplementary Figure S8. MyD88 expression on either hematopoietic and non-hematopoietic cells is sufficient for the induction of CD11b$^+$ IgA$^+$ cells

Two months after the bone marrow transfers shown by the arrows, mononuclear cells were isolated from the intestinal lamina propria for flow cytometric analysis of CD11b$^+$ IgA$^+$ cells. Data are representative of five mice.



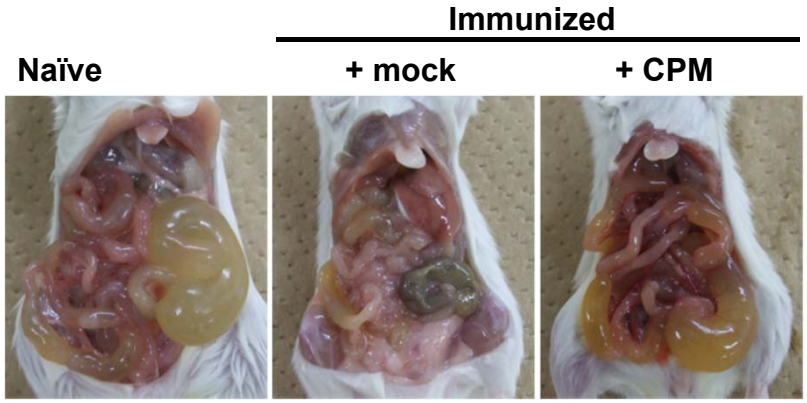
Supplementary Figure S9. Normal differentiation into IgA$^+$ B cells in the Peyer's patches and peritoneal cavity of IL-10 knockout mice

Cells were isolated from the Peyer's patches (**a**) and peritoneal cavity (**b**) of wile-type (WT) or IL-10 knockout (KO) mice to detect expression of IgA and IgM. Similar results were obtained from four separate experiments.



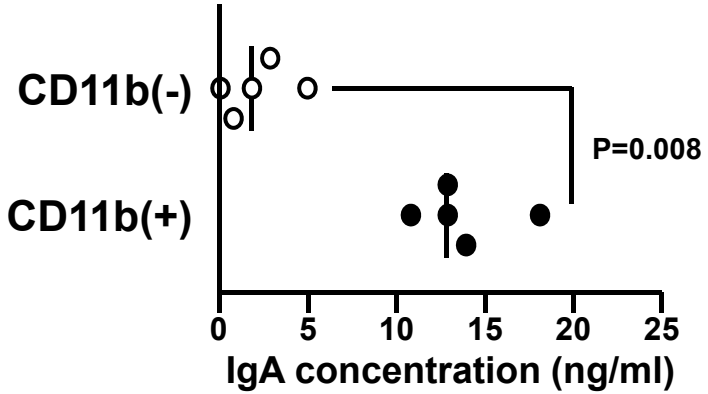
Supplementary Figure S10. Cyclophosphamide treatment during oral immunization diminishes germinal center B cell abundance and consequently reduces IgA$^+$ plasmablast abundance

Mice were treated with cyclophosphamide (CPM) or were mock-treated during oral immunization with ovalbumin plus cholera toxin. Two days after the treatment, cells were isolated from Peyer's patches for flow cytometric analysis of B220$^+$ PNA$^+$ germinal center B cells (**a**) and IgA$^+$ IgM$^-$ plasmablasts (**b**). Data are representative of three separate experiments.



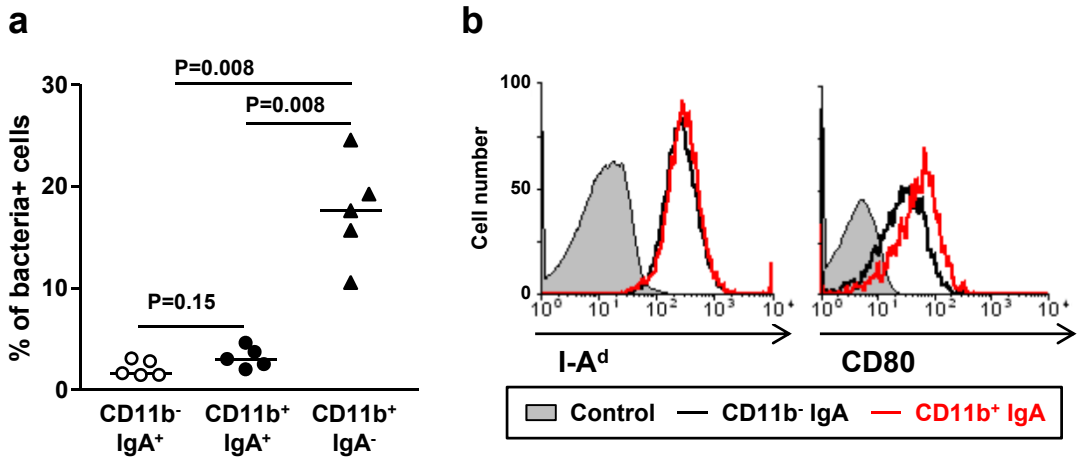
Supplementary Figure S11. Image of diarrhea induced by cholera toxin

Mice were orally immunized with ovalbumin plus cholera toxin (CT) on days 0, 7, and 14. One group received cyclophosphamide (CPM) after the last immunization (days 18, 19, 20). One week after the final immunization (day 21), mice were orally challenged with 100 μg CT. After 15 h, the incidence of diarrhea was determined. Data are representative of five experiments.



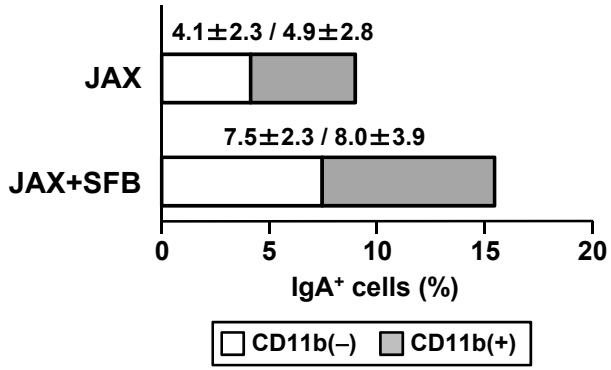
Supplementary Figure S12. High IgA production from CD11b$^+$ IgA$^+$ cells in vivo

CD11b$^+$ IgA$^+$ and CD11b$^-$ IgA$^+$ cells were purified from the intestinal lamina propria and adoptively transferred into SCID mice (1.5×10^5 cells/mouse). One week after the transfer, the amount of IgA in the feces was measured by ELISA. Similar results were obtained from two separate experiments.



Supplementary Figure S13. Few bacterial uptake activity and identical expression of MHC class II and CD80 of CD11b$^+$ and CD11b$^-$ IgA$^+$ cells

(**a**) Mononuclear cells were isolated from the intestinal lamina propria and incubated with fluorescent opsonized bacteria for 90 min. The bacteria uptake by each population was examined by flow cytometry. (**b**) The expression of I-A^d and CD80 was examined on CD11b$^+$ IgA$^+$ (red) and CD11b$^-$ IgA$^+$ (black) cells isolated from the small intestinal lamina propria of wild-type mice. Shadow indicates isotype control Ab. Data are representative of three separate experiments.



Supplementary Figure S14. Segmented filamentous bacteria (SFB) are not involved in specific induction of CD11b$^+$ IgA cells in the intestine

(**a**) Mononuclear cells were isolated from the intestinal lamina propria of control Jackson mice (JAX) or Jackson mice colonized with faecal homogenates from SFB-monoassociated mice (JAX+SFB). The data represent the percentage of CD11b$^+$ and CD11b$^-$ IgA$^+$ cells analyzed by flow cytometry. Values represent the mean ± SD (n=4).

Supplementary Table S1 Gene ontology enrichment score highly expressed in CD11b^{+} IgA^{+} cells compared with CD11b^{-} IgA^{+} cells

GO ACCESSION	GO Term	p-value	corrected p-value	Count in Selecti	% Count in Selection	Count in Total	% Count in Total
GO:0044427	chromosomal part	3.91E-20	2.36E-15	144	4.123711	351	1.9954519
GO:0000279	M phase	2.31E-19	3.48E-15	123	3.5223367	286	1.6259239
GO:0022402	cell cycle process	1.55E-19	3.48E-15	160	4.5819016	411	2.3365548
GO:0022403	cell cycle phase	1.88E-19	3.48E-15	139	3.980527	339	1.9272314
GO:0007049	cell cycle	5.62E-19	6.77E-15	234	6.7010307	689	3.9169984
GO:0005694	chromosome	3.25E-18	3.26E-14	163	4.6678123	433	2.4616258
GO:0000278	mitotic cell cycle	2.83E-17	2.44E-13	110	3.1500573	257	1.4610574
GO:0000087	M phase of mitotic cell cycle	3.90E-16	2.93E-12	89	2.5486827	196	1.1142695
GO:0006996	organelle organization	1.37E-15	9.18E-12	332	9.507445	1133	6.4411597
GO:0048285	organelle fission	1.94E-15	1.17E-11	88	2.5200458	197	1.1199545

Supplementary Table S2 Microarray data on cell cycle-associated molecules highly expressed in $CD11b^+$ IgA^+ cells

Probe Set ID	Ratio	Symbol	Title
1416076_at	3.38	Ccnb1	cyclin B1
1416698_a_at	3.25	Cks1b	CDC28 protein kinase 1b
1417019_a_at	3.05	Cdc6	cell division cycle 6 homolog (S. cerevisiae)
1417911_at	3.65	Ccna2	cyclin A2
1418919_at	20.24	Sgol1	shugoshin-like 1 (S. pombe)
1422046_at	8.92	Itgam	integrin alpha M (CD11b)
1424128_x_at	3.68	Aurkb	aurora kinase B
1426817_at	3.12	Mki67	antigen identified by monoclonal antibody Ki 67
1439436_x_at	3.37	Incenp	inner centromere protein
1448314_at	3.05	Cdc2a	cell division cycle 2 homolog A (S. pombe)
1448466_at	3.50	Cdca5	cell division cycle associated 5
1451246_s_at	3.88	Aurkb	aurora kinase B
1452305_s_at	3.58	Cenpn	centromere protein N
1428481_s_at	3.38	Cdca8	cell division cycle associated 8
1429326_at	4.87	Cenpl	centromere protein L
1432361_a_at	3.24	Cenpp	centromere protein P
1436847_s_at	3.30	Cdca8	cell division cycle associated 8
1443294_at	7.55	Crkrs	CDC2-related kinase, arginine/serine-rich
1456077_x_at	14.48	Cdc25c	cell division cycle 25 homolog C (S. pombe)

Supplementary Table S3 Microarray data on cell surface molecules highly expressed in $CD11b^+$ IgA^+ cells

Probe Set ID	CD11b-	CD11b+	Gene Symbol	Gene Title
1422046_at	15.230377	135.8069	Itgam	CD11b (αM integrin)
1425570_at	38.918594	127.18432	Slamf1	CD150 (signaling lymphocytic activation molecule family member 1)
1425815_a_at	35.757877	105.87889	Hmmr	CD168 (hyaluronan mediated motility receptor)
1450156_a_at	25.355202	56.041107	Hmmr	CD168 (hyaluronan mediated motility receptor)
1427771_x_at	4.150068	14.996672	Itgb1	β1 integrin
1429871_at	1.5343701	14.869006	Hmmr	CD168 (hyaluronan mediated motility receptor)

Supplementary Table S4 Similar and different immunological phenotypes between $CD11b^+$ and $CD11b^-$ IgA^+ cells in the small intestine

	$CD11b^+$ IgA^+ cell	**$CD11b^-$ IgA^+ cell**
Same/similar phenotypes		
Morphology	Plasma cell (large irregular nuclei with prominent nucleoli)	
Blimp-1 expression	High	
Cell surface markers	$B220^-$ $CD18^+$ $CD19^{int}$ $CD38^{hi}$ CD40+ CD86+ CD138+ MHC II+	
Uptake of opsonized bacteria	No	
Different phenotypes		
Microbial stimulation	Required	NOT required
IL-10	Required	NOT required
Lymphoid structure of Peyer's patches	Required	NOT required
Proliferation	High	Low/negative
Cell surface marker	$CD150^{hi}$	$CD150^{low}$
IgA production	High	Low