

Supplementary Information

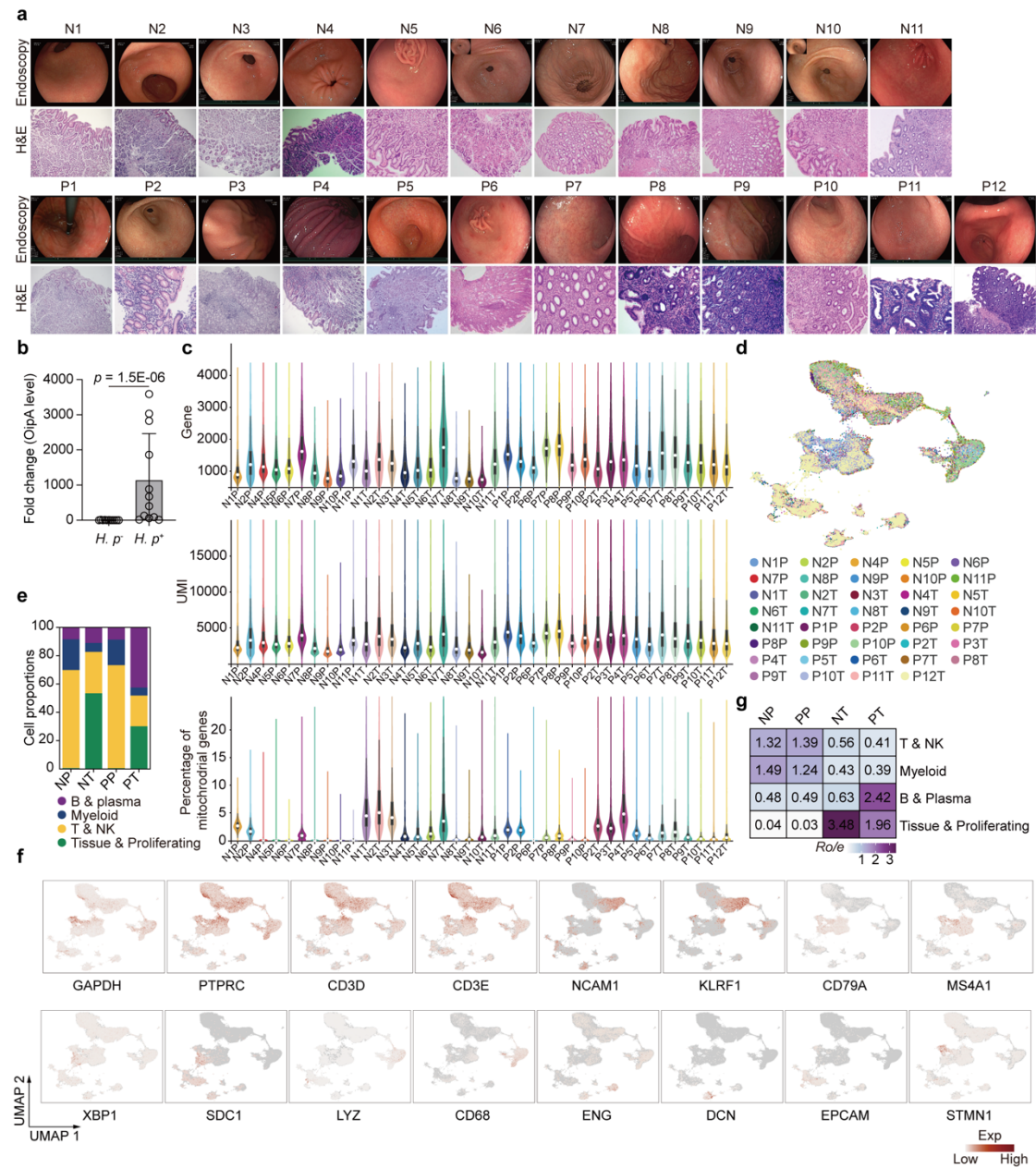
**Contains 6 Supplementary Figures
and
5 Supplementary Tables.**

**Single-cell RNA sequencing dissects the immunosuppressive signatures in
Helicobacter pylori-infected human gastric ecosystem**

Authors

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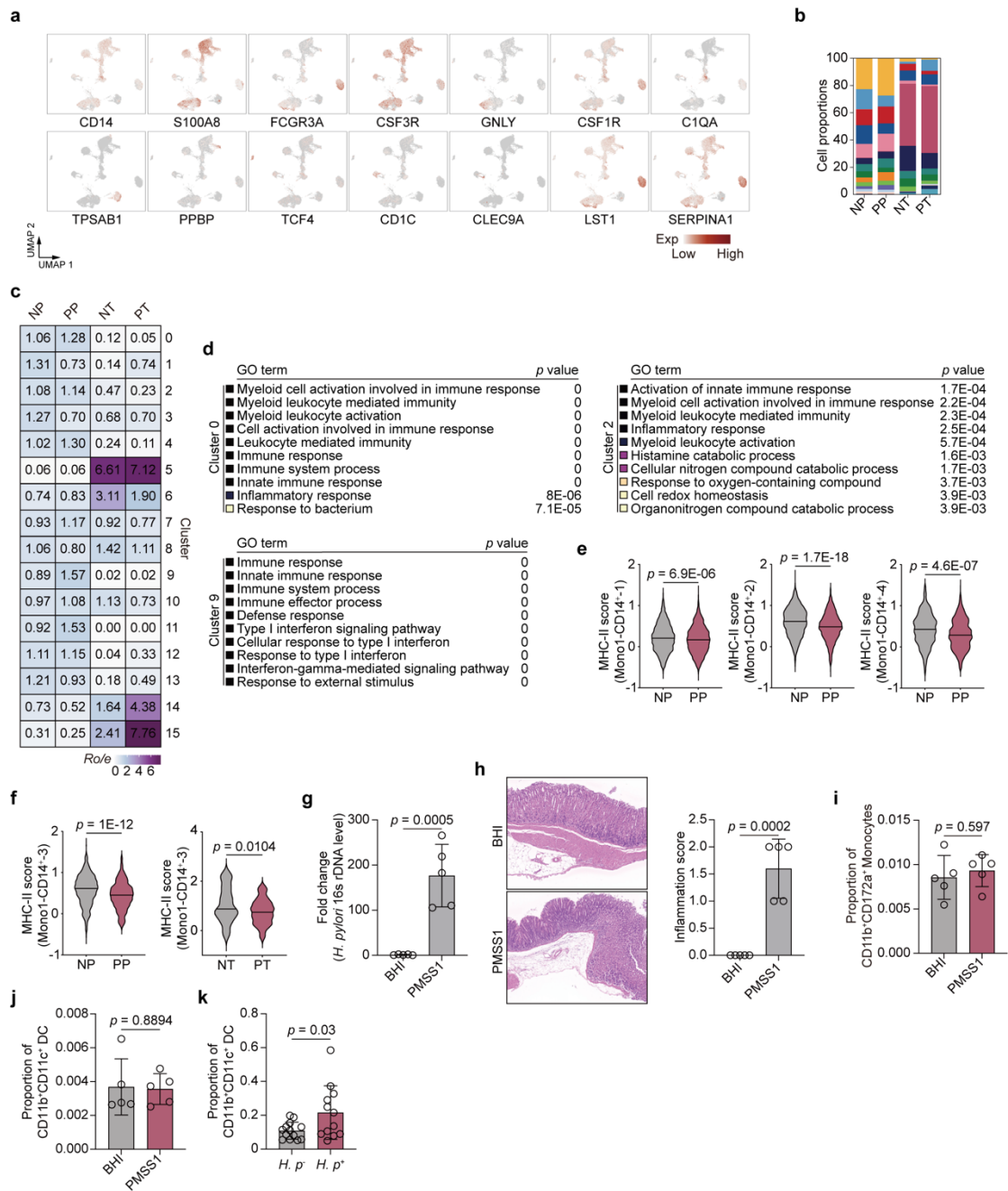
Supplementary Figure 1, related to Figure 1



Supplementary Figure 1. Cohort characteristics and single cell profiling of human gastric ecosystem reprogrammed by *H. pylori* infection, related to Figure 1.

- (a) Representative Colonoscopy and H&E histological images for 11 *H. pylori*-negative and 12 *H. pylori*-positive subjects in the discovery cohort are presented.
 - (b) The OipA expression levels in *H. pylori*-negative (n = 11) and *H. pylori*-positive (n = 12) gastric specimens are determined by quantitative PCR (qPCR) method. Quantitative data are shown as Mean $\pm$ SD. The *p* value is calculated by two-sided Wilcoxon rank sum test, and is shown in the figure panels.
 - (c) Violin plots showing the number of genes, UMIs, and percentage of mitochondrial genes after data processing for each subject.
 - (d) Cells originated from each subject are shown by UMAP plot.
 - (e) Histogram showing the proportion of major cell types in each group.
 - (f) UMAP plots showing the expression levels of marker genes, defined for all cell types.
 - (g) Sample prevalence of each major cell clusters estimated by *Ro/e* score.
- Source data are provided as a Source Data file. **p* < 0.05; ***p* < 0.01; ****p* < 0.001; *****p* < 0.0001.

Supplementary Figure 2, related to Figure 2



Supplementary Figure 2. Repressed antigen processing and presentation capacities of *H. pylori*-infected antigen-presenting cells (APCs), related to Figure 2.

- (a) UMAP plots showing the expression levels of marker genes, defined for myeloid cell lineages.
- (b) Histogram showing the proportion of myeloid clusters in each experimental group.
- (c) Sample prevalence of each myeloid cluster estimated by *Ro/e* score.
- (d) GO term enrichment showing the over-presented pathways in Cluster 0, 2 and 9.
- (e) Violin plots showing the MHC-II scores of Cluster 0 (Left), 2 (Middle), 9 (Right) from NP or PP samples. Violin outline width represents density. Horizontal line represents median. *P* values are calculated using the two-sided Wilcoxon rank sum test, and are shown in the figure panels.
- (f) Violin plots showing the MHC-II scores of Cluster 7 from PBMC (Left) or gastric tissue (Right) samples with or without *H. pylori* infection. Violin outline width represents density. Horizontal line represents median. *P* values are calculated using the two-sided Wilcoxon rank sum test, and are shown in the figure panels.
- (g) C57/BL6J mice were administrated with BHI (*n* = 5) or *H. pylori* PMSS1 strain (*n* = 5) for two months. Mouse gastric tissues were extracted for DNA. *H. pylori* levels were quantified by qPCR, detecting *H. pylori*-specific *16S* ribosomal DNA. Mouse *Gapdh* was used as the internal control. Quantitative data are shown as Mean ± SD. The *p* value is calculated by two-tailed student's unpaired t-test, and is shown in the figure panels.
- (h) Histopathology (Left) and gastric inflammation scores (Right) of BHI (*n* = 5) and PMSS1-infected (*n* = 5) C57/BL6J mice. Quantitative data are shown as Mean ± SD. The *p* value is calculated by two-tailed student's unpaired t-test, and is shown in the figure panels.
- (i) PBMCs were isolated from the blood of BHI (*n* = 5) or PMSS1-treated (*n* = 5) mice and subjected for flow cytometry analysis. Single immune cells were gated and dead cells were excluded via FVS450 signal. Mice peripheral monocytes were defined by CD45⁺Ly6G⁻CD11b⁺CD172a⁺. The proportion of CD45⁺Ly6G⁻

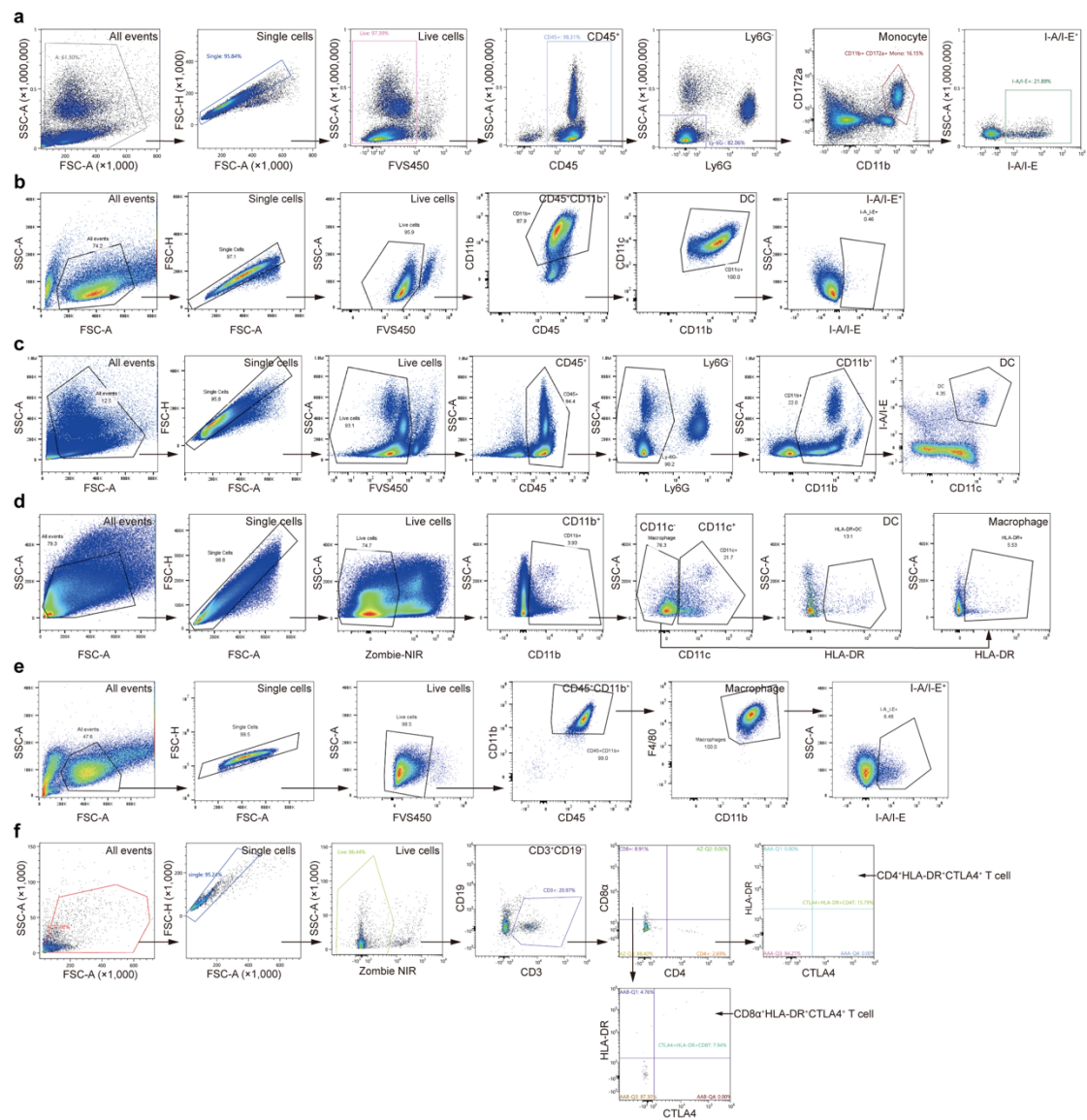
CD11b⁺CD172a⁺ monocytes in the blood of BHI (n = 5) or PMSS1-treated (n = 5) mice were analyzed. Quantitative data are shown as Mean ± SD. The *p* value is calculated by two-tailed student's unpaired t-test, and is shown in the figure panels.

(j) C57/BL6J mice were administrated with BHI (n = 5) or *H. pylori* PMSS1 strain (n = 5) for two months. PBMCs were isolated from the blood of BHI or PMSS1-treated mice and subjected for flow cytometry analysis. Single immune cells were gated and dead cells were excluded via FVS450 signal. Mice peripheral DCs were defined by CD45⁺Ly6G⁻CD11b⁺CD11c⁺. The proportion of CD45⁺Ly6G⁻CD11b⁺CD11c⁺ DCs in the blood of BHI (n = 5) or PMSS1-treated (n = 5) mice were analyzed. Quantitative data are shown as Mean ± SD. The *p* value is calculated by two-tailed student's unpaired t-test, and is shown in the figure panels.

(k) Gastric biopsies from *H. pylori*-negative (n = 13) or *H. pylori*-positive (n = 12) patients were collected to isolate immune cells, then subjected them for flow cytometry analysis. Single immune cells were gated and dead cells were excluded via Zombie-NIR signal. Human gastric DCs were defined by CD11b⁺CD11c⁺. The proportion of CD11b⁺CD11c⁺ DCs in *H. pylori*-negative (n = 13) or *H. pylori*-positive (n = 12) human gastric biopsies were analyzed. Quantitative data are shown as Mean ± SD. The *p* value is calculated by two-tailed student's unpaired t-test, and is shown in the figure panels.

Source data are provided as a Source Data file. **p* < 0.05; ***p* < 0.01; ****p* < 0.001; *****p* < 0.0001.

Supplementary Figure 3



Supplementary Figure 3. Gating strategies used for cell identification.

(a) Gating strategy to identify mice peripheral monocytes ($CD45^+Ly6G^-CD11b^+CD172a^+$) from the blood of BHI (n = 5) or PMSS1-treated (n = 5) C57/BL6J mice presented on Fig. 2l and Supplementary Fig. 2i.

(b) Gating strategy to identify DC cells ($CD45^+CD11b^+CD11c^+$) from DC2.4 cells infected with *H. pylori* TN2GF4 or NCTC 11637 strains (MOI = 1:10) for three days presented on Fig. 2o.

(c) Gating strategy to identify mice peripheral DCs ($CD45^+Ly6G^-CD11b^+CD11c^+$) from the blood of BHI (n = 5) or PMSS1-treated (n = 5) C57/BL6J mice presented on Fig. 2p and Supplementary Fig. 2j.

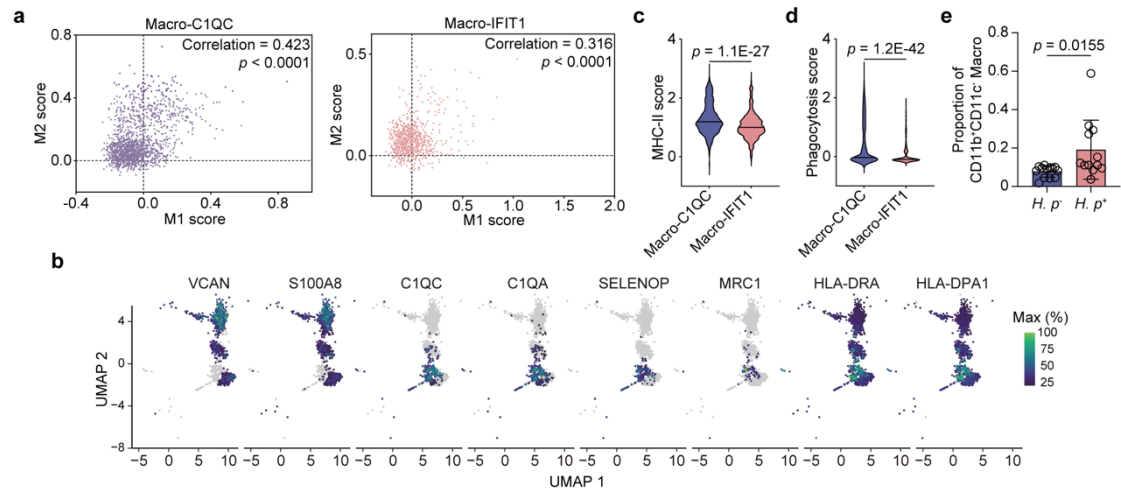
(d) Gating strategy to identify human gastric DCs ($CD11b^+CD11c^+$) and macrophages ($CD11b^+CD11c^-$) from gastric biopsies collected from *H. pylori*-negative (n = 13) or *H. pylori*-positive (n = 12) patients presented on Fig. 2q, 3h and Supplementary Fig. 2k, 4e.

(e) Gating strategy to identify macrophages ($CD45^+CD11b^+F4/80^+$) from BMDM cells infected with *H. pylori* TN2GF4 or NCTC 11637 strains (MOI = 1:50) for three days presented on Fig. 3g.

(f) Gating strategy to identify $CD4^+CTLA4^+HLA-DR^+$ and $CD8\alpha^+CTLA4^+HLA-DR^+$ T cells from gastric biopsies collected from *H. pylori*-negative (n = 13) or *H. pylori*-positive (n = 12) patients presented on Supplementary Fig. 6f-g.

Source data are provided as a Source Data file.

Supplementary Figure 4, related to Figure 3



Supplementary Figure 4. Macrophages developed from monocyte-like precursors exhibiting an immunosuppressive phenotype following *H. pylori* colonization, related to Figure 3.

(a) Scatterplots showing M1 and M2 scores for the Macro-C1QC (Left) and Macro-IFIT1 (Right) subsets.

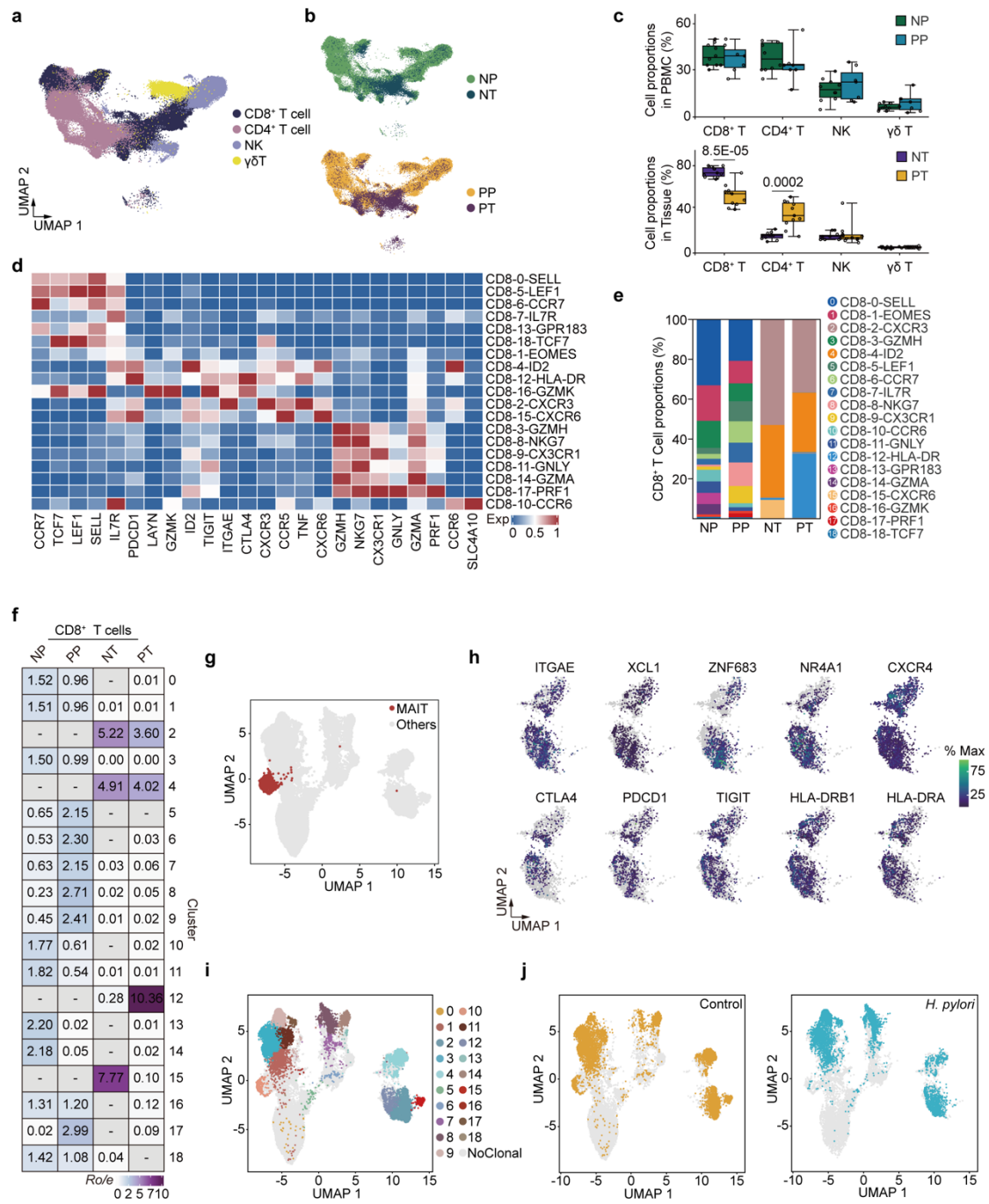
(b) Monocle 3 plots showing the expression levels of VCAN, S100A8, C1QC, C1QA, SELENOP, MRC1, HLA-DRA and HLA-DPA1 along with the trans-differentiation from monocytes (Cluster 7), through IFIT1⁺ macrophages, towards C1QC⁺ macrophages.

(c-d) Violin plots comparing the MHC-II (c) and phagocytosis (d) scores between Macro-C1QC and Macro-IFIT1 subsets. Violin outline width represents density. Horizontal line represents median. *P* values are calculated using the two-sided Wilcoxon rank sum test, and are shown in the figure panels.

(e) Gastric biopsies from *H. pylori*-negative (n = 13) or *H. pylori*-positive (n = 12) patients were collected to isolate immune cells, then subjected them for flow cytometry analysis. Single immune cells were gated and dead cells were excluded via Zombie-NIR signal. Human gastric macrophages were defined by CD11b⁺CD11c⁻. The proportion of CD11b⁺CD11c⁻ Macrophages in *H. pylori*-negative (n = 13) or *H. pylori*-positive (n = 12) human gastric biopsies were analyzed. Quantitative data are shown as Mean ± SD. The *p* value is calculated by two-tailed student's unpaired t-test, and is shown in the figure panels.

Source data are provided as a Source Data file. **p* < 0.05; ***p* < 0.01; ****p* < 0.001; *****p* < 0.0001.

Supplementary Figure 5, related to Figure 4



Supplementary Figure 5. CD8⁺HLA-DR⁺CTLA4⁺ T cells exhibited immunosuppressive phenotypes upon *H. pylori* colonization, related to Figure 4.

(a-b) UMAP plots showing CD4⁺, CD8⁺, NK and $\gamma\delta$ T cell subsets derived from *H. pylori*-negative or *H. pylori*-positive patients. (a) Each subcluster is color-coded according to cell type. (b) Cells from *H. pylori*-negative (Upper) or *H. pylori*-positive (Down) patients are shown.

(c) Boxplots showing the proportion of each T&NK cell subset in PBMC (Upper) or gastric tissue (Down) samples. Quantitative data are shown as Mean $\pm$ SD. *P* values are calculated using the two-sided Wilcoxon rank sum test, and are shown in the figure panels.

(d) The expression (scaled mean expression) of marker genes for each CD8⁺ T cell subset is indicated by heatmap.

(e) Histogram showing the proportion of CD8⁺ T cell subclusters in each experimental group.

(f) Sample prevalence of each CD8⁺ T cell cluster estimated by *Ro/e* score.

(g) UMAP plot showing the distribution of MAIT cells (Red) representing the specific TCR combination in CD8⁺ T cells.

(h) Monocle 3 plot showing the expression levels of ITGAE, XCL1, ZNF683, NR4A1, CXCR4, CTLA4, PDCD1, TIGIT, HLA-DRB1 and HLA-DRA along with the trans-differentiation among tissue-resident CD8⁺ T cell populations.

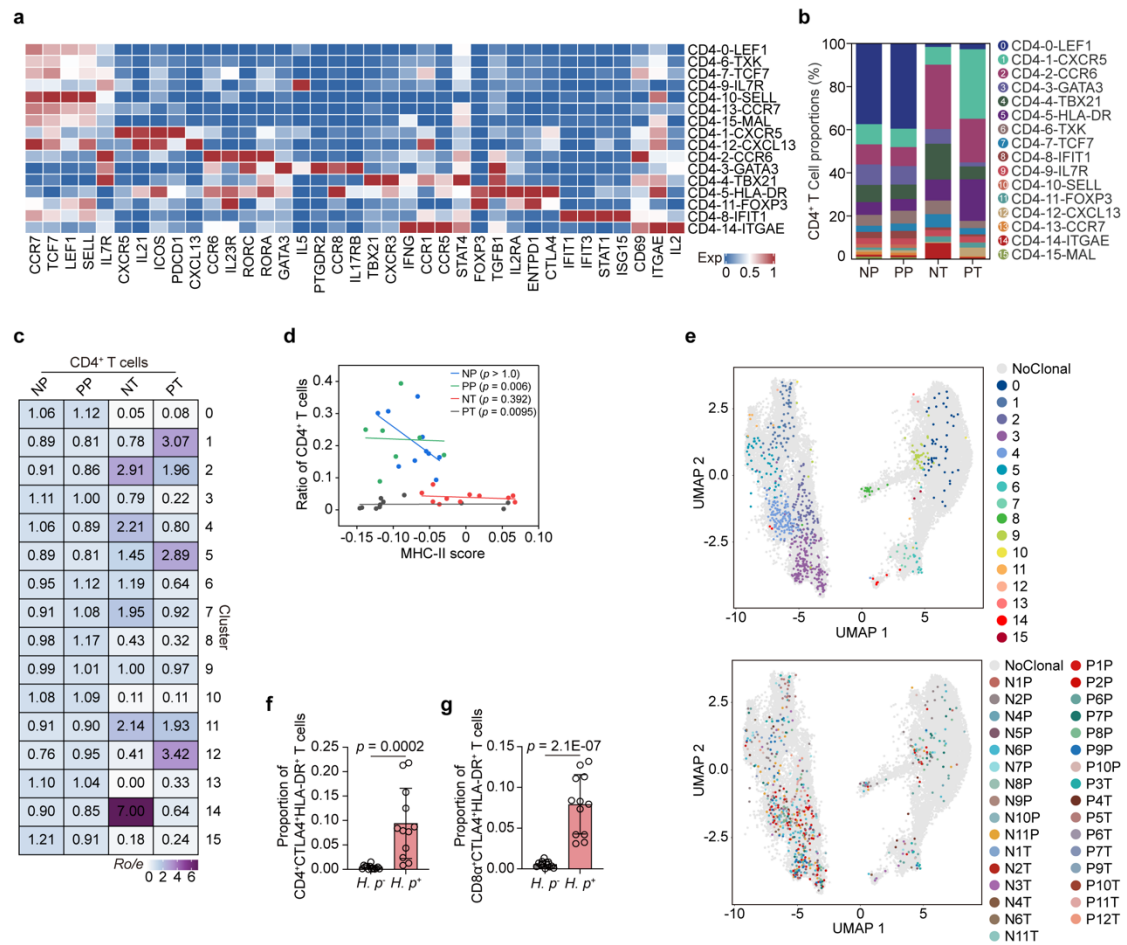
(i) UMAP plot showing the distribution of clonal T cells (> 1 cell) in each CD8⁺ T cell subset.

(j) Clonal CD8⁺ T cells in either Control (Right) or *H. pylori*-positive (Left) group are shown by UMAP plots.

Source data are provided as a Source Data file. **p* < 0.05; ***p* < 0.01; ****p* < 0.001;

*****p* < 0.0001.

Supplementary Figure 6, related to Figure 5



Supplementary Figure 6. Interaction between HLA-DR⁺CTLA4⁺ T cells and macrophages via the CTLA4/CD86 axis upon *H. pylori* infection, related to Figure 5.

(a) The expression (scaled mean expression) of marker genes for each CD4⁺ T cell subset is indicated by heatmap.

(b) Histogram showing the proportion of CD4⁺ T cell subclusters in each experimental group.

(c) Sample prevalence of each CD4⁺ T cell cluster estimated by *Ro/e* score.

(d) Scatterplot showing the correlation between MHC-II score and CD4⁺ T cell proportions in NP (n = 10), PP (n = 7), NT (n = 11), and PT (n = 11) samples. *P* values are assessed with the F-statistic, and are shown in the figure panels. Pearson correlation.

(e) (Upper) UMAP plot showing the distribution of clonal T cells (> 1 cell) in each CD4⁺ T cell subset. (Down) TCR clones derived from each analyzed subject are shown.

(f) Gastric biopsies from *H. pylori*-negative (n = 13) or *H. pylori*-positive (n = 12) patients were collected to isolate immune cells, then subjected them for flow cytometry analysis. The proportion of gastric CD4⁺CTLA4⁺HLA-DR⁺ (f) and CD8α⁺CTLA4⁺HLA-DR⁺ (g) cells in *H. pylori*-negative (n = 13) or *H. pylori*-positive (n = 12) patients were analyzed. Quantitative data are shown as Mean ± SD. *P* values are calculated by two-tailed student's unpaired t-test, and is shown in the figure panels.

Source data are provided as a Source Data file. **p* < 0.05; ***p* < 0.01; ****p* < 0.001;

*****p* < 0.0001.

Supplementary Table 1. Primer sequences used in this study.

oipA-F	ATGAAAAAAGCCCTCTTACTAAT
oipA-R	TTAATGTTTGTTTTAAAGTTATATGT
H. pylori-16S-F	TTTGTTAGAGAAGATAATGACGGTATCTAAC
H. pylori-16S-R	CATAGGATTTACACCTGACTGACTATC
Gapdh-F	GCAGTGGCAAAGTGGAGATT
Gapdh-R	TCTCCATGGTGGTGAAGACA

Supplementary Table 2. Clinical information of patients in the discovery cohort.

Patient_ID	Experiment_Group	Age	Mean age ± SD	Gender	BMI	Mean BMI ± SD	Samples	Gastroscopic Diagnosis	Pathological Diagnosis	<i>H. pylori</i>	DOB	Mean DOB ± SD	Virulence Factor Status
N1	<i>H. pylori</i> -	25	23.64 ± 2.07	male	23.12	21.53 ± 1.59	N1P, N1T	<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.5	0.37 ± 0.18	-
N2	<i>H. pylori</i> -	23		female	19.95		N2P, N2T	<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.4		-
N3	<i>H. pylori</i> -	27		female	20.57		N3T	<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.2		-
N4	<i>H. pylori</i> -	24		female	20.83		N4P, N4T	<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.1		-
N5	<i>H. pylori</i> -	23		male	21.26		N5P, N5T	<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.7		-
N6	<i>H. pylori</i> -	22		male	23.31		N6P, N6T	<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.4		-
N7	<i>H. pylori</i> -	25		male	22.4		N7P, N7T	<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.3		-
N8	<i>H. pylori</i> -	24		female	19.11		N8P, N8T	<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.4		-
N9	<i>H. pylori</i> -	23		female	22.77		N9P, N9T	<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.1		-
N10	<i>H. pylori</i> -	25		female	19.56		N10P, N10T	<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.6		-
N11	<i>H. pylori</i> -	29		male	23.97		N11P, N11T	<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.5		-
P1	<i>H. pylori</i> +	24	26.25 ± 3.415	female	22.46	21.27 ± 1.72	P1P	<i>H. pylori</i> + Superficial Gastritis	Chronic superficial gastritis	+	27.7	23.05 ± 9.67	CagA+, VacA+, UreB+, UreA+
P2	<i>H. pylori</i> +	25		female	19.28		P2P, P2T	<i>H. pylori</i> + Superficial Gastritis (Nodularity-like appearance)	Moderate chronic gastritis	+	28.1		CagA+, VacA+, UreB+, UreA+
P3	<i>H. pylori</i> +	26		male	18.25		P3T	<i>H. pylori</i> + Superficial Gastritis	Chronic superficial gastritis	+	22.5		CagA+, VacA+, UreB+, UreA+
P4	<i>H. pylori</i> +	27		female	19.63		P4T	<i>H. pylori</i> + Superficial Gastritis	Moderate chronic gastritis	+	46.8		CagA+, VacA+, UreB+, UreA+
P5	<i>H. pylori</i> +	22		female	21.63		P5T	<i>H. pylori</i> + Atrophic Gastritis	Moderate chronic gastritis	+	27.1		CagA+, VacA+, UreB+, UreA+
P6	<i>H. pylori</i> +	34		female	19.17		P6P, P6T	<i>H. pylori</i> + Superficial Gastritis	Moderate chronic gastritis	+	15.8		CagA+, VacA+, UreB+, UreA+
P7	<i>H. pylori</i> +	24		female	20.55		P7P, P7T	<i>H. pylori</i> + Superficial Gastritis	Chronic superficial gastritis	+	14.4		CagA+, VacA+, UreB+, UreA+
P8	<i>H. pylori</i> +	24		male	21.48		P8P, P8T	<i>H. pylori</i> + Atrophic Gastritis	Moderate chronic gastritis	+	14.5		CagA+, VacA+, UreB+, UreA+
P9	<i>H. pylori</i> +	29		male	22.83		P9P, P9T	<i>H. pylori</i> + Superficial Gastritis	Moderate chronic gastritis	+	32		CagA+, VacA+, UreB+, UreA+
P10	<i>H. pylori</i> +	28		male	22.66		P10P, P10T	<i>H. pylori</i> + Superficial Gastritis	Chronic superficial gastritis	+	9.3		CagA+, VacA+, UreB+, UreA+
P11	<i>H. pylori</i> +	32		female	24.53		P11T	<i>H. pylori</i> + Superficial Gastritis (Nodularity-like appearance)	Moderate chronic gastritis	+	32.8		CagA+, VacA+, UreB+, UreA+
P12	<i>H. pylori</i> +	26		female	22.74		P12T	<i>H. pylori</i> + Superficial Gastritis	Chronic superficial gastritis	+	17.6		CagA+, VacA+, UreB+, UreA+
<i>p</i> value (Two-tailed student's unpaired t-test)			0.083161693			0.726700816						2.43935E-07	

Abbreviation, BMI: Body mass index; DOB: Delta over baseline value.

Supplementary Table 3. Signature related gene sets used in myeloid.

MHC-II	M1_Polarization	M2_Polarization	Phagocytosis
HLA-DMA	IL12A	ARG1	MRC1
HLA-DMB	IL12B	ARG2	CD163
HLA-DOA	IL23A	IL10	MERTK
HLA-DOB	TNF	FCGR2A	C1QB
HLA-DPA1	IL6	FCGR2B	
HLA-DPB1	NOS2	CD163	
HLA-DQA1	FCGR1A	MRC1	
HLA-DQA2	CD80	FCER2	
HLA-DQB1	CXCL9	CD200R1	
HLA-DQB2	CXCL10	PDCD1LG2	
HLA-DRA	CXCL11	CD274	
HLA-DRB1	CD86	CSF1R	
HLA-DRB5	IL1A	CD206	
HLA-DRB6	IL1B	IL1RN	
	CCL5	IL1R2	
	IRF5	IL4R	
	IRF1	CCL4	
	CD40	CCL13	
	IDO1	CCL20	
	KYNU	CCL17	
	CCR7	CCL18	
	CD64	CCL22	
		CCL24	
		LYVE1	
		VEGFA	
		VEGFB	
		VEGFC	
		VEGFD	
		EGF	
		CTSA	
		CTSB	
		CSTC	
		CTSD	
		TGFB1	
		FASLG	
		TGFB2	
		TGFB3	
		MMP14	
		MMP19	
		MMP9	
		CLEC7A	
		WNT7B	
		FASL	
		TNFSF12	
		TNFSF8	
		CD276	
		VTCN1	
		MSR1	
		FN1	
		IRF4	
		MARCO	
		NRP2	

Supplementary Table 4. Clinical information of patients in the validation cohort.

Patient_ID	Experiment_Group	Age	Mean age ± SD	Gender	BMI	Mean BMI ± SD	Gastroscopic Diagnosis	Pathological Diagnosis	<i>H. pylori</i>	DOB	Mean DOB ± SD	Virulence Factor Status
Control1	<i>H. pylori</i> -	28	28 ± 2.83	Female	23.64	23.08 ± 1.32	<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.3	0.51 ± 0.22	-
Control2	<i>H. pylori</i> -	27		Male	24.72		<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.7		-
Control3	<i>H. pylori</i> -	27		Male	21.39		<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.5		-
Control4	<i>H. pylori</i> -	30		Female	23.25		<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.2		-
Control5	<i>H. pylori</i> -	24		Female	20.81		<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.5		-
Control6	<i>H. pylori</i> -	31		Male	23.07		<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.1		-
Control7	<i>H. pylori</i> -	33		Male	22.19		<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.4		-
Control8	<i>H. pylori</i> -	26		Female	24.65		<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.6		-
Control9	<i>H. pylori</i> -	23		Male	22.71		<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.8		-
Control10	<i>H. pylori</i> -	29		Female	23.84		<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.3		-
Control11	<i>H. pylori</i> -	26		Male	21.49		<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.5		-
Control12	<i>H. pylori</i> -	31		Male	23.46		<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.7		-
Control13	<i>H. pylori</i> -	28		Female	20.82		<i>H. pylori</i> - gastritis	Chronic superficial gastritis	-	0.2		-
HP1	<i>H. pylori</i> +	30	28.83 ± 3.70	Male	22.28	22.58 ± 1.69	<i>H. pylori</i> + Superficial Gastritis	Chronic superficial gastritis	+	16.7	26.16 ± 9.13	CagA+, VacA+, UreB+, UreA+
HP2	<i>H. pylori</i> +	32		Male	20.5		<i>H. pylori</i> + Superficial Gastritis	Moderate chronic gastritis	+	23.4		CagA+, VacA+, UreB+, UreA+
HP3	<i>H. pylori</i> +	24		Female	21.91		<i>H. pylori</i> + Superficial Gastritis	Chronic superficial gastritis	+	12.9		CagA+, VacA+, UreB+, UreA+
HP4	<i>H. pylori</i> +	21		Male	24.21		<i>H. pylori</i> + Superficial Gastritis	Chronic superficial gastritis	+	35.1		CagA+, VacA+, UreB+, UreA+
HP5	<i>H. pylori</i> +	33		Female	23.74		<i>H. pylori</i> + Superficial Gastritis (Nodularity-like appearance)	Moderate chronic gastritis	+	18.5		CagA+, VacA+, UreB+, UreA+
HP6	<i>H. pylori</i> +	34		Male	22.19		<i>H. pylori</i> + Atrophic Gastritis	Moderate chronic gastritis	+	29.8		CagA+, VacA+, UreB+, UreA+
HP7	<i>H. pylori</i> +	26		Female	18.89		<i>H. pylori</i> + Superficial Gastritis	Chronic superficial gastritis	+	11.3		CagA+, VacA+, UreB+, UreA+
HP8	<i>H. pylori</i> +	31		Male	19.84		<i>H. pylori</i> + Superficial Gastritis	Chronic superficial gastritis	+	31.6		CagA+, VacA+, UreB+, UreA+
HP9	<i>H. pylori</i> +	28		Female	20.84		<i>H. pylori</i> + Atrophic Gastritis	Moderate chronic gastritis	+	22		CagA+, VacA+, UreB+, UreA+
HP10	<i>H. pylori</i> +	28		Male	22.72		<i>H. pylori</i> + Superficial Gastritis	Chronic superficial gastritis	+	27.9		CagA+, VacA+, UreB+, UreA+
HP11	<i>H. pylori</i> +	27		Female	22.99		<i>H. pylori</i> + Superficial Gastritis	Chronic superficial gastritis	+	14.2		CagA+, VacA+, UreB+, UreA+
HP12	<i>H. pylori</i> +	27		Male	23.62		<i>H. pylori</i> + Superficial Gastritis	Moderate chronic gastritis	+	38.5		CagA+, VacA+, UreB+, UreA+
<i>p</i> value (Two-tailed student's unpaired t-test)			0.716051543			0.198202684					3.80152E-09	

Abbreviation, BMI: Body mass index; DOB: Delta over baseline value.

Supplementary Table 5. Antibodies and reagents used in FACS staining.

Supplementary Figure 3a. Identification of mice peripheric monocyte.			
Antibody/Reagents	Manufacturer	Catalog number	Dilution
BD Horizon Fixable Viability Stain 450	BD	562247	1:1000
CD45-AF532	Thermofisher	58-0451-82	1:100
Ly-6G -BV421	BioLegend	127627	1:100
CD11b-PE-Cy7	BD	552850	1:60
CD172a-APC	BioLegend	144013	1:200
I-A I-E-PerCP-Cy5.5	BD	562363	1:200

Supplementary Figure 3b. Identification of DCs.			
Antibody/Reagents	Manufacturer	Catalog number	Dilution
BD Horizon Fixable Viability Stain 450	BD	562247	1:1000
CD45-AF532	Thermofisher	58-0451-82	1:60
CD11b-PE-Cy7	BD	552850	1:60
CD11c-APC	BioLegend	117309	1:60
I-A I-E-PerCP-Cy5.5	BD	562363	1:120

Supplementary Figure 3c. Identification of mice peripheric DCs.			
Antibody/Reagents	Manufacturer	Catalog number	Dilution
BD Horizon Fixable Viability Stain 450	BD	562247	1:1000
CD45-AF532	Thermofisher	58-0451-82	1:100
Ly-6G-BV421	Biolegend	127627	1:100
CD11b-PE-Cy7	BD	552850	1:100
CD11c-APC	Biolegend	117309	1:200
I-A I-E-PerCP-Cy5.5	BD	562363	1:200

Supplementary Figure 3d. Identification of human gastric DCs and macrophages.			
Antibody/Reagents	Manufacturer	Catalog number	Dilution
Zombie NIR Fixable Viability Kit	Biolegend	423105	1:200
CD11b-AF700	BioLegend	301355	1:100
CD11C-PE	BioLegend	371503	1:100
HLA-DR-BV605	BioLegend	307640	1:100

Supplementary Figure 3e. Identification of macrophages.			
Antibody/Reagents	Manufacturer	Catalog number	Dilution
BD Horizon Fixable Viability Stain 450	BD	562247	1:1000
CD45-AF532	Thermofisher	58-0451-82	1:60
CD11b-PE-Cy7	BD	552850	1:60
F4/80-BV605	BD	743281	1:30
I-A I-E-PerCP-Cy5.5	BD	562363	1:120

Supplementary Figure 3f. Identification of different gastric T cell subsets.			
Antibody/Reagents	Manufacturer	Catalog number	Dilution
Zombie NIR Fixable Viability Kit	Biolegend	423105	1:200
CD3-AF532	eBioscience	58-0038-42	1:100
CD19-FITC	BioLegend	302205	1:100
CD4-PerCP-cy5.5	BioLegend	300529	1:100
CD8-PE	BioLegend	344705	1:100
CTLA4-APC	BioLegend	349907	1:100
HLA-DR-BV605	BioLegend	307640	1:100