

Platelet activation plays a pro-inflammatory role in myasthenia gravis

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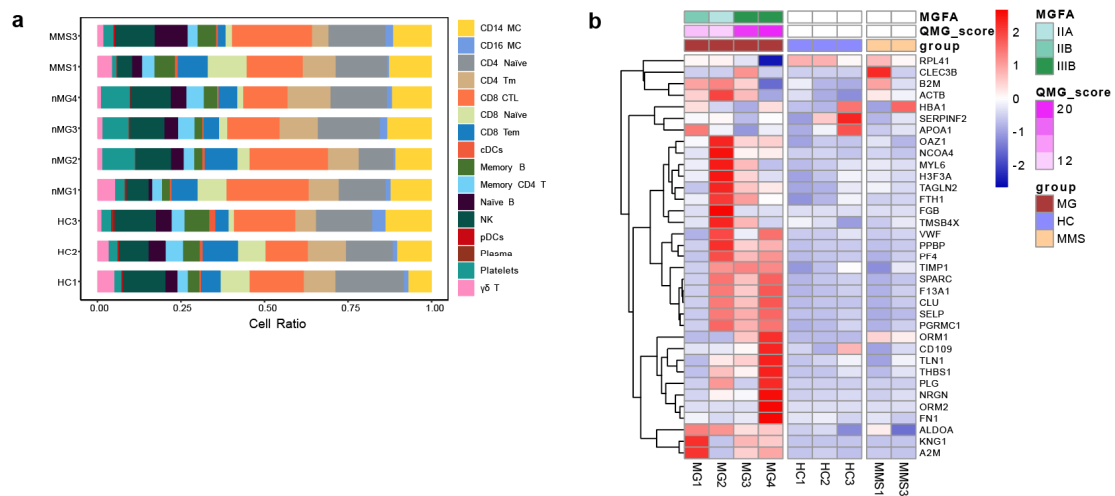
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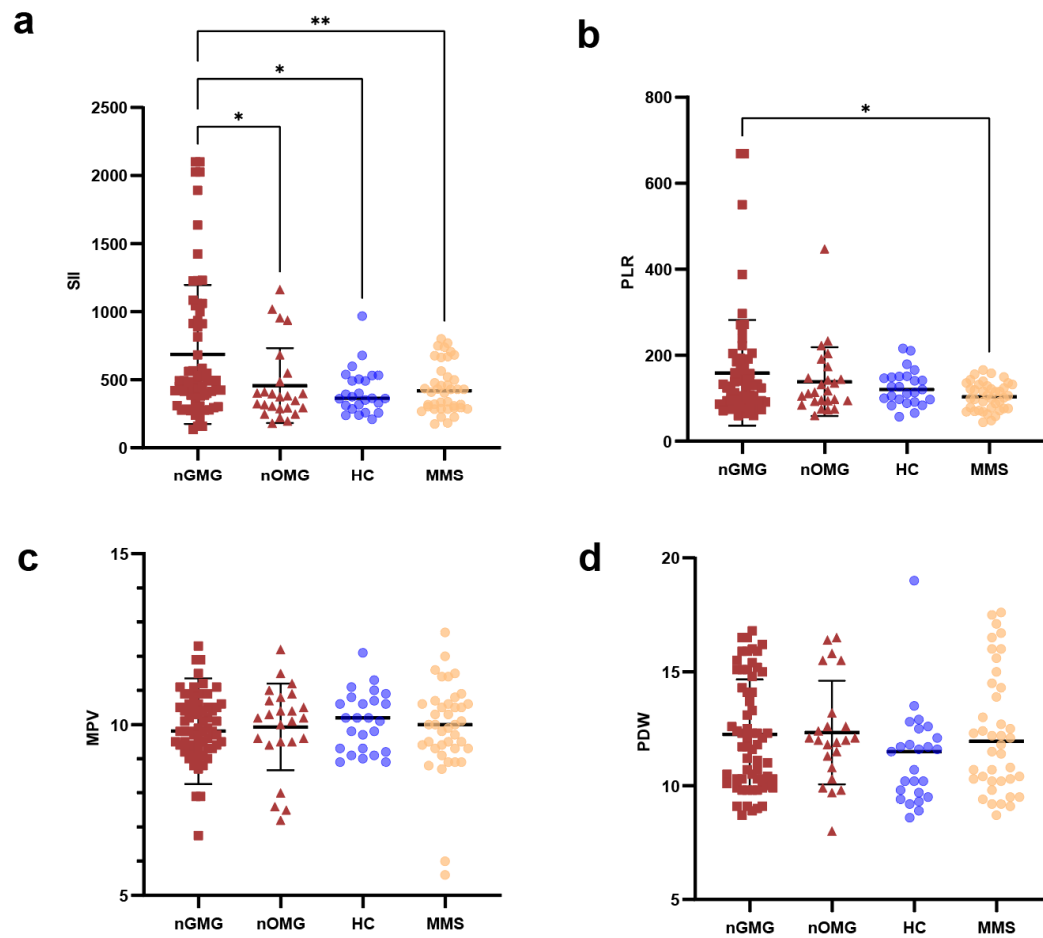
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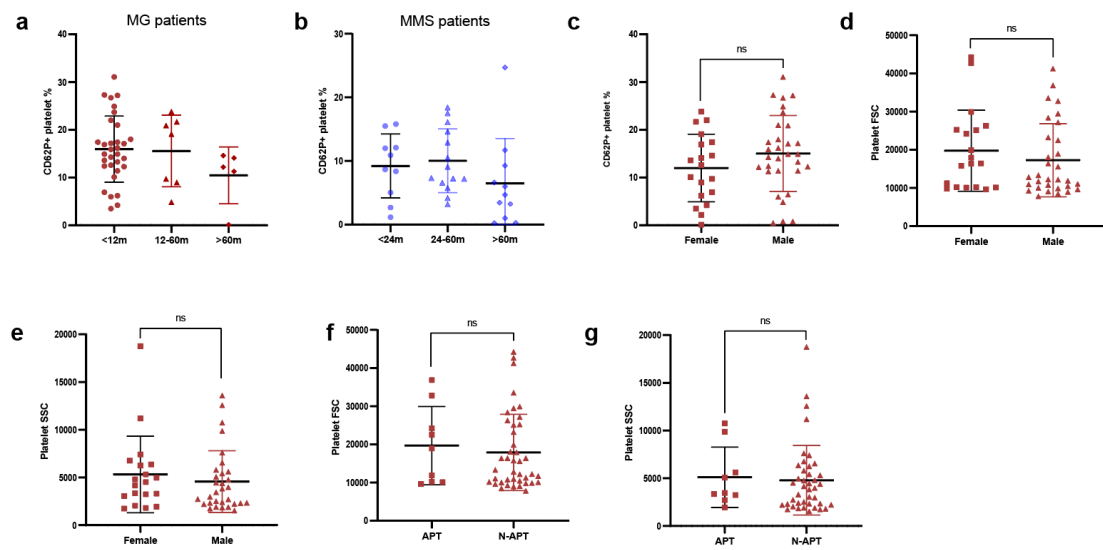
Supplementary Figure Legend



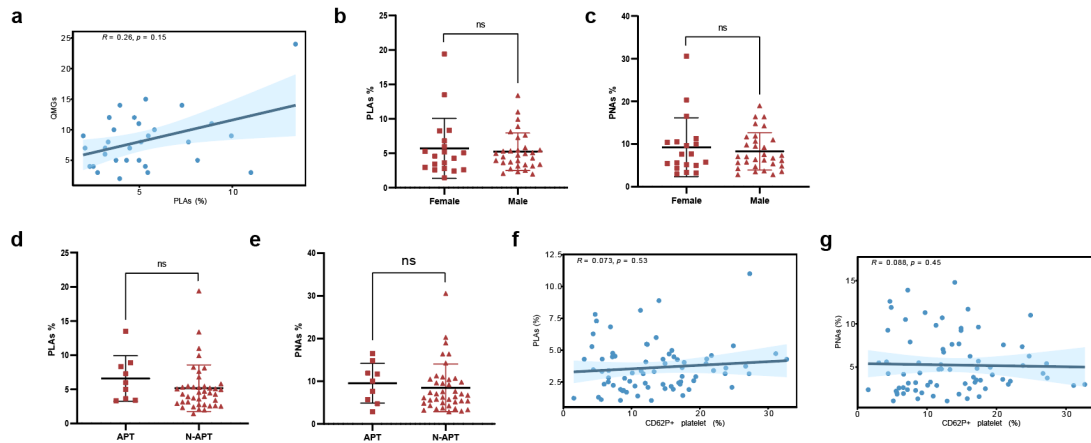
Supplementary Figure 1. Single-Cell RNA sequencing and platelet analysis. a Cell composition analysis of PBMCs from HC, nMG, and MMS patients using single-cell RNA sequencing (scRNA-seq). The stacked bar plots represent the proportions of various cell types, including CD14⁺ monocytes (MC), CD16⁺ MC, CD4⁺ naive T cells, CD4⁺ memory T cells (Tm), CD8⁺ cytotoxic T lymphocytes (CTL), CD8⁺ naive T cells, CD8⁺ effector memory T cells (Tem), cDCs, pDCs, memory B cells, naive B cells, NK cells, plasma cells, and platelets. **b** Heatmap showing the expression of platelet degranulation genes across different patient groups (MG, HC, MMS). Each column represents an individual sample, while each row represents a specific gene. The color intensity indicates the level of gene expression, with red representing higher expression and blue representing lower expression. The heatmap includes the clinical characteristics (MGFA and QMG scores) of the patients. Notably, nMG4 exhibited increased platelet counts and elevated expression of platelet degranulation genes. MGFA, Myasthenia Gravis Foundation of America clinical classification; QMG, quantitative myasthenia gravis scores; PBMCs, peripheral blood mononuclear cells; scRNA-seq, single-cell RNA sequencing; nMG, immunotherapy-naive MG; HC, healthy controls; MMS, minimal manifestation status.



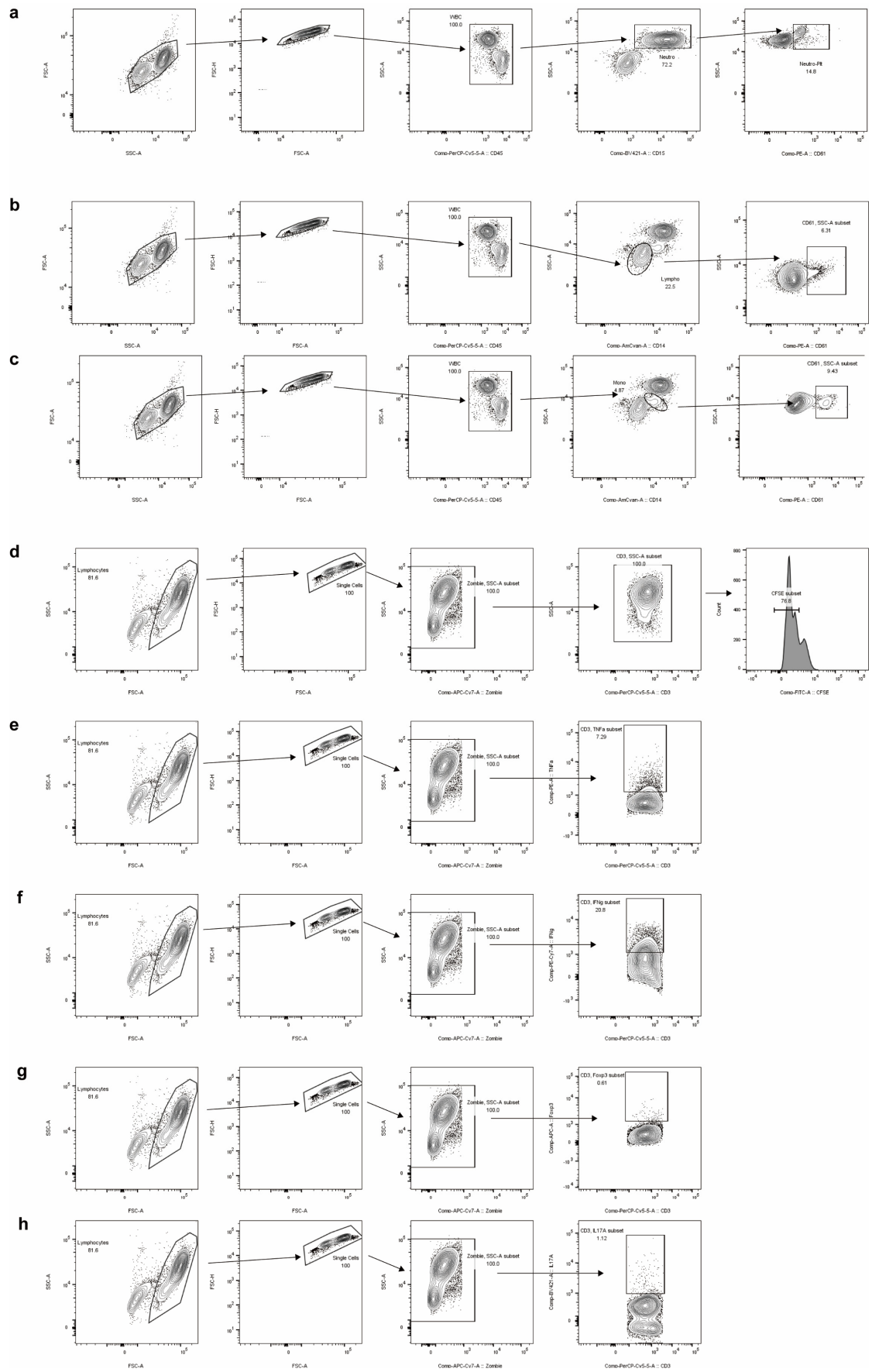
Supplementary Figure 2. Comparison of blood count data in nGMG, nOMG, and MMS groups. **a** Comparison of the SII among patients with nGMG (n=65), nOMG (n=25), MMS (n=40) and HC (n=25). The results indicate that nGMG patients exhibited significantly elevated SII compared to nOMG ($p=0.0441$), HC ($p=0.0114$) and MMS ($p=0.0051$) patients. **b** Comparison of PLR among the three groups. nGMG patients showed significantly higher PLR compared to MMS patients ($p=0.0140$). **c** Comparison of MPV across the three groups, indicating no significant differences among nGMG, nOMG, and MMS patients. **d** Comparison of platelet distribution width (PDW) across the three groups, showing no significant differences. Data are presented as mean $\pm$ s.d., with individual biological replicates shown. P values were determined using ordinary one-way ANOVA followed by Tukey's multiple comparisons test. Significance levels are denoted by asterisks: * $p<0.05$, ** $p<0.01$. Non-significant results are labeled as 'ns'. nGMG, immunotherapy-naive GMG; nOMG, immunotherapy-naive OMG; HC, healthy controls; MMS, minimal manifestation status; SII, systemic immune-inflammation index; PLR, platelet to lymphocyte ratio; MPV, mean platelet volume; PDW, platelet distribution width.



Supplementary Figure 3. Gender-based and antiplatelet treatment-related comparisons of platelet activation and morphology. This figure illustrates platelet activation levels and morphological differences across disease duration, gender, and treatment groups. **a-b** The percentage of CD62P⁺ platelets in nMG and MMS patients stratified by disease duration: <12 months (n=32), 12–60 months (n=7), and >60 months (n=5) for nMG (a), and <24 months (n=10), 24–60 months (n=14), and >60 months (n=11) for MMS (b). No significant differences were observed in platelet activation across different disease durations. **c-e** Gender-based comparisons of platelet activation and morphology (n=19 for female and n=31 for male), including CD62P⁺ platelet percentage (c), FSC (d), and SSC (e), with no significant differences (ns) observed between female and male subjects. **f-g** Comparison of platelet morphology between APT (n=9) and N-APT (n=41) groups, assessing platelet FSC (f) and platelet SSC (g), also showing ns between groups. Data are presented as mean $\pm$ s.d., with individual biological replicates shown. P values were determined using ordinary one-way ANOVA followed by Tukey's multiple comparisons test or two-tailed Student's t-test. nMG, immunotherapy-naïve MG; MMS, minimal manifestation status; FSC, platelet forward scatter; SSC, platelet side scatter; APT, antiplatelet therapy.

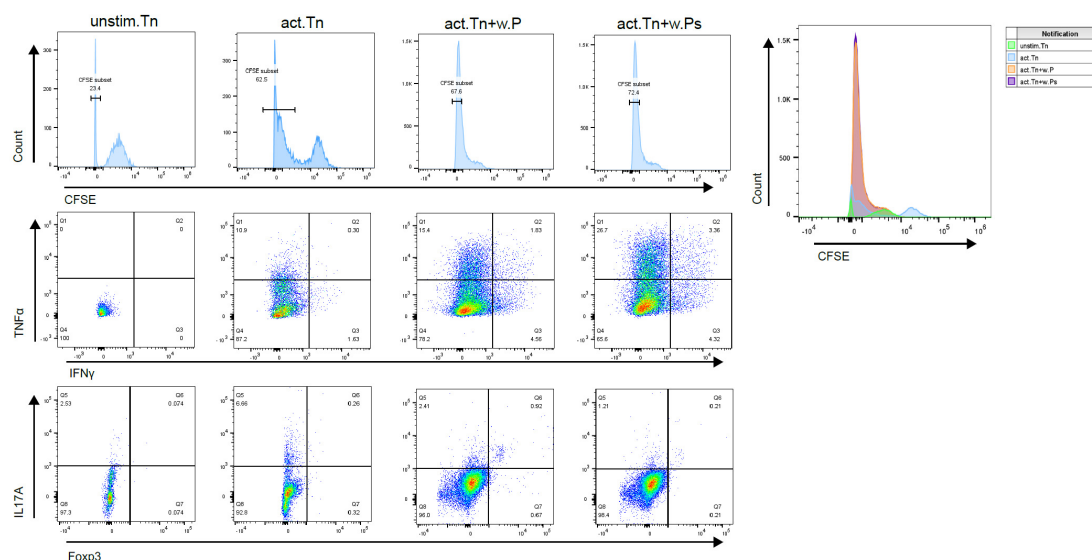


Supplementary Figure 4. Analysis of platelet-leukocyte and platelet-neutrophil aggregates across different groups. This figure examines the differences in PLAs and PNAs across gender and treatment groups, as well as their correlation with disease parameters. **a** No significant correlation was observed between PLA percentage and QMG score ($n=35$, $R=0.26$, $p=0.15$). **b-c** Gender-based comparisons ($n=19$ for female and $n=31$ for male) revealed no significant differences (ns) in PLAs (b) and PNAs (c) between female and male subjects. **d-e** Similarly, ns were found between APT ($n=9$) and N-APT ($n=41$) groups in PLA (d) and PNA (e) percentages. **f-g** Correlation analyses ($n=68$) showed no significant relationships between CD62P⁺ platelet percentages and PLAs ($R=0.073$, $p=0.53$) (f) or PNAs ($R=0.088$, $p=0.45$) (g). Data are presented as mean $\pm$ s.d., with individual biological replicates shown. P values were determined using two-tailed Student's t-test. For correlation analysis, two-sided Spearman's rank correlation was applied and the regression line is shown with a shaded area indicating the 95% confidence interval. PLAs, platelet-leukocyte aggregates; PNAs, platelet-neutrophil aggregates; QMG score, quantitative myasthenia gravis score; APT, antiplatelet therapy.



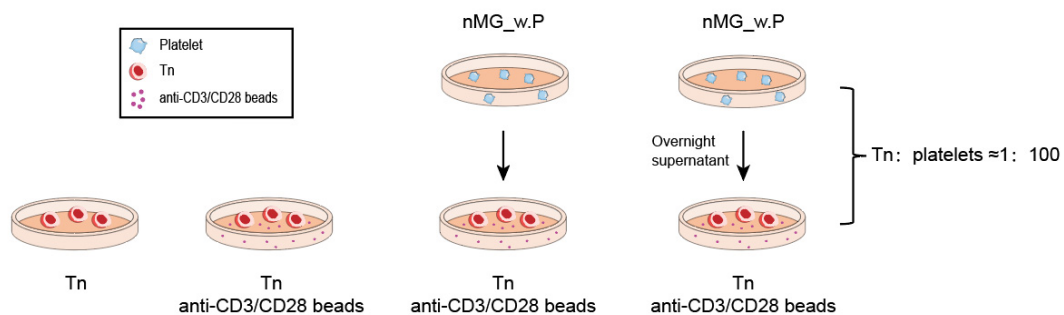
Supplementary Figure 5. Gating strategies used for cell sorting. a Gating strategy

to sort PNAs from peripheral blood presented on Fig.5c, f, g. **b** Gating strategy to sort PLyAs from peripheral blood presented on Fig.5d. **c** Gating strategy to sort PMAs from peripheral blood presented on Fig.5e. **d** Gating strategy to sort proliferated CD4 T cells cells from platelet-CD4 T cell in vitro cultures presented on Fig. 6a, f, j, k and Fig.7b. **e** Gating strategy to sort TNF α + CD4 T cells cells from platelet-CD4 T cell in vitro cultures presented on Fig. 6e,n,r and Fig.7b. **f** Gating strategy to sort INF γ + CD4 T cells cells from platelet-CD4 T cell in vitro cultures presented on Fig. 6b, l, p and Fig.7b. **g** Gating strategy to sort Foxp3+ CD4 T cells cells from platelet-CD4 T cell in vitro cultures presented on Fig. 6e, n, r and Fig.7b. **h** Gating strategy to sort IL17A+ CD4 T cells cells from platelet-CD4 T cell in vitro cultures presented on Fig. 6d, o, s and Fig.7b.

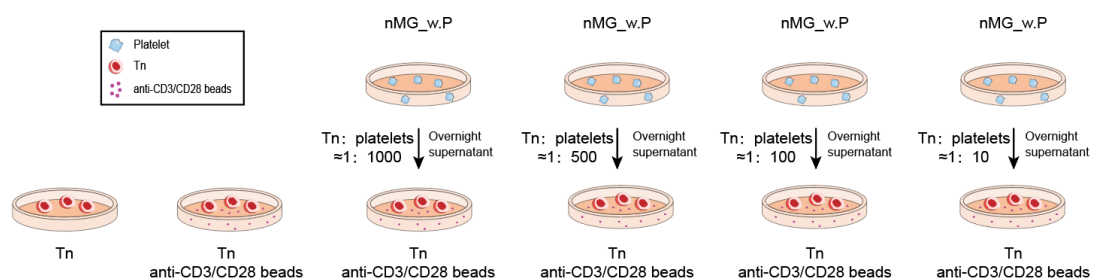


Supplementary Figure 6. T cell proliferation and differentiation analysis after 3-day co-culture with platelets from different sources. Flow cytometry analysis post 3-day culture revealed significant proliferation of naive T cells (Tn) activated with CD3/CD28 monoclonal antibodies (act.Tn) compared to unstimulated Tn cells (unstim.Tn), without evident differentiation changes. Top Row (CFSE Proliferation Assay): CFSE dilution profiles show the extent of Tn cell proliferation across different culture conditions: unstimulated Tn cells (unstim.Tn), activated Tn cells (act.Tn), activated Tn cells co-cultured with washed platelets (act.Tn+w.P), and activated Tn cells co-cultured with platelet supernatant (act.Tn+w.Ps). The rightmost plot compares the CFSE dilution profiles of all groups. Middle and Bottom Rows: Flow cytometry dot plots illustrate the expression of TNF α , INF γ , IL17A, and Foxp3

within the CD3⁺ T cell population under different culture conditions, indicating T cell differentiation into Th1, Th17, and Treg subgroups. Upon co-culture with platelets or their supernatants, T cell proliferation was further enhanced, and differentiation into specific Th cell subgroups (TNF α ⁺, IFN γ ⁺, IL17A⁺, Foxp3⁺) was promoted.



Supplementary Figure 7. The experimental design compares the effect of platelets on naive T cell (Tn) proliferation and differentiation under both contact and non-contact culture conditions. The group settings include: Tn cells alone without anti-CD3/CD28 bead activation; Tn cells cultured solely with anti-CD3/CD28 bead activation; Tn cells co-cultured with anti-CD3/CD28 bead activation in the presence of washed platelets (nMG_w.P); Tn cells co-cultured with anti-CD3/CD28 bead activation in the presence of platelet supernatant (nMG_w.Ps). The ratio of Tn cells to platelets is approximately 1:100.



Supplementary Figure 8. Comparative analysis of the effect of platelets on naive T cell (Tn) proliferation and differentiation in non-contact culture conditions at varying cell ratios. This figure illustrates the experimental groups designed to assess the impact of different platelet concentrations on Tn cell behavior under non-contact conditions. The experimental setup includes: Tn cells without anti-CD3/CD28 magnetic bead activation; Tn cells alone with anti-CD3/CD28 bead activation; Activated Tn cells co-cultured with platelets at ratios of 1:1000, 1:500, 1:100, and

1:10.

Supplementary Table 1. Information of scRNA-seq enrolled participants

Participants	MG1	MG2	MG3	MG4	HC1	HC2	HC3
Gender	Female	Female	Female	Male	Female	Female	Female
Age (year)	20-25	50-55	35-40	70-75	25-30	35-40	45-50
Course (month)	36	2	24	10	-	-	-
Symptoms at enrollment	Diplopia, dysphagia, dysarthria, dyspnea, limb weakness	Ptosis, dysphagia, limb weakness	Ptosis, dysphagia, dysarthria, limb weakness	Ptosis, diplopia, masticatory weakness, dysphagia, dysarthria, limb weakness	-	-	-
Thymus imaging	Normal involuted	Normal involuted	Normal involuted	Normal involuted	-	-	-
Thymectomy	No	No	No	No	-	-	-
MGFA classification	IIb	IIb	IIIb	IIIa	-	-	-
ADL	9	8	10	9	-	-	-
QMGs	17	11	20	21	-	-	-
Anti-AChR	Positive	Positive	Positive	Positive	-	-	-
Treatment	TAC + Prednisone	TAC + Prednisone	TAC	TAC + Prednisone	-	-	-
Duration to MMS (month)	7	-	8	-	-	-	-
ADL at MMS	0	-	0	-	-	-	-
QMGs at MMS	3	-	3	-	-	-	-

scRNA-seq, single-cell RNA sequencing; anti-AChR: acetylcholine receptor antibodies; HC, healthy controls; nMG, immunotherapy-naïve myasthenia gravis; MMS, minimal clinical status; MGFA: Myasthenia Gravis Foundation of America; TAC, tacrolimus.

Supplementary Table 2. Number of Platelets Captured and the Percentage of Platelets in PBMCs for Each Sample in Single-Cell Sequencing

Sample	Number of total PBMCs	Number of Platelets Captured	Percentage of Platelets in PBMCs (%)
MG1	3450	98	2.8
MG2	11982	1174	9.8
MG3	15546	1215	7.8
MG4	8435	566	6.7
HC1	10732	228	2.1
HC2	10849	284	2.6
HC3	7042	200	2.8
MMS1	13672	177	1.3
MMS3	15669	474	3.0

PBMCs, peripheral blood mononuclear cells; HC, healthy controls; MG, myasthenia gravis; MMS, minimal clinical status.

Supplementary Table 3. Demographic and clinical profiles associated with laboratory data in the study cohort

Characteristics	nGMG (n=65)	nOMG (n=25)	MMS (n=40)	HC (n=25)	P value
Age (years)	52.37 ± 17.06	54.32 ± 13.04	54.58 ± 13.83	56.12 ± 15.42	0.7841
Sex, female, n (%)	34 (52.3)	13 (52)	21 (52.5)	14 (56)	0.9577
QMGs	11.65 ± 6.07	3.5 ± 2.89	2.30 ± 2.23	-	-
Course (month)	21.69 ± 47.98	25.1 ± 56.96	59.51 ± 67.69	-	-
MGFA					
I	0	25 (100)	-	-	-
IIa	19 (29.2)	-	-	-	-
IIb	3 (4.6)	-	-	-	-
IIIa	20 (30.8)	-	-	-	-
IIIb	12 (18.5)	-	-	-	-
IVa + IVb + V	10 (15.4)	-	-	-	-
Thymus, n (%)					
Thymoma	8 (12.3)	3 (12)	10 (25)	-	-
Hyperplasia	13 (20)	4 (16)	7 (17.5)	-	-
Normal involuted	44 (67.7)	18 (72)	23 (57.5)	-	-
Thymectomy, n (%)	1 (1.5)	1 (4)	7 (17.5)	-	-
Immunotherapy, n (%)					
None	65 (100)	25 (100)	2 (5)	-	-
CS	-	-	8 (20)	-	-
IS	-	-	24 (60)	-	-
CS and IS	-	-	6 (15)	-	-
Non-immune treatments, n (%)					
Pyridostigmine	40 (61.5)	14 (56)	27 (67.5)	-	-
APT	0	0	0	-	-

Categorical variables are presented as counts (%), while continuous variables are expressed as mean ± standard error of the mean (SEM). P values were determined using ordinary one-way ANOVA followed by Tukey's multiple comparisons test and Chi-square test. HC, healthy controls; nMG, immunotherapy-naïve myasthenia gravis; MMS, minimal clinical status; QMGs, quantitative MG scores; CS, corticosteroid; IS, non-steroidal immunosuppressants; APT, antiplatelet therapy.

Supplementary Table 4. Demographic and clinical characteristics of bulk-RNA-seq samples

Participants	MG1	MG2	MG3	HC1	HC2	HC3
Gender	Female	Female	Male	Female	Female	Male
Age (year)	30-35	45-50	60-65	25-30	40-45	60-65
Course (month)	15.1	6.7	21.6	-	-	-
Symptoms at enrollment	limb and cervical muscles weakness	Ptosis, limb weakness	Ptosis, dysphagia, dysarthria	-	-	-
Thymus imaging	Normal involuted	Hyperplasia	Normal involuted	-	-	-
Thymectomy	No	No	No	-	-	-
MGFA classification	IIIa	IIa	IIb	-	-	-
ADL	4	4	2	-	-	-
QMGs	12	7	8	-	-	-
Anti-AChR	Positive	Positive	Positive	-	-	-
Treatment at enrollment	None	None	None	-	-	-

anti-AChR: acetylcholine receptor antibodies; HC, healthy controls; nMG, immunotherapy-naïve myasthenia gravis; MMS, minimal clinical status; MGFA: Myasthenia Gravis Foundation of America.

Supplementary Table 5. Demographic and clinical characteristics of peripheral blood flow cytometry samples

Characteristics	nMG (<i>n</i> =50)	MMS (<i>n</i> =35)	HC (<i>n</i> =20)	<i>P</i> value
Age (years)	55.5 ± 14.78	53.53 ± 16.74	51.7 ± 17.24	0.3625
Sex, female, n (%)	19 (38)	15 (42.9)	8 (40)	0.7337
QMGs	8.18 ± 4.74	2.25 ± 2.01	-	-
Course (month)	24.41 ± 45.51	45.55 ± 42.24	-	-
MGFA				
I	26 (52)	-	-	-
IIa	7 (14)	-	-	-
IIb	4 (8)	-	-	-
IIIa	7 (14)	-	-	-
IIIb	4 (8)	-	-	-
IVa + IVb + V	2 (4)	-	-	-
Thymus, n (%)				
Thymoma	5 (10)	12 (34.3)		
Hyperplasia	13 (26)	10 (28.6)		
Normal involuted	32 (64)	12 (37.1)		
Thymectomy, n (%)	0	14 (40)		
Immunotherapy, n (%)				
None	50 (100)	5 (14.3)	-	-
CS	-	10 (28.6)	-	-
IS	-	13 (37.1)	-	-
CS and IS	-	7 (20)	-	-
Non-immune treatments, n (%)				
Pyridostigmine	24 (48)	10 (28.6)	-	-
APT	9 (18)	0	-	-

Categorical variables are presented as counts (%), while continuous variables are expressed as mean ± standard error of the mean (SEM). *P* values were determined using ordinary one-way ANOVA followed by Tukey's multiple comparisons test and Chi-square test. HC, healthy controls; nMG, immunotherapy-naïve myasthenia gravis; MMS, minimal clinical status; QMGs, quantitative MG scores; CS, corticosteroid; IS, non-steroidal immunosuppressants; APT, antiplatelet therapy.

Supplementary Table 6. Demographic and clinical characteristics of plasma samples

Characteristics	nMG (<i>n</i> =24)	MMS (<i>n</i> =18)	HC (<i>n</i> =18)	<i>p</i> value
Age (years)	55.63 ± 16.53	52.78 ± 16.56	51.67 ± 17.16	0.3533
Sex, female, n (%)	11 (45.8)	8 (44.4)	8 (44.4)	0.9263
QMGs	6.29±4.02	1.67±1.94	-	-
Course (month)	19.04±27.53	52.11±43.93	-	-
MGFA				
I	7 (29.2)	-	-	-
IIa	6 (25)	-	-	-
IIb	5 (20.8)	-	-	-
IIIa	4 (16.7)	-	-	-
IIIb	2 (8.3)	-	-	-
IVa + IVb + V	0	-	-	-
Thymus, n (%)				
Thymoma	4 (16.7)	5 (27.8)		
Hyperplasia	5 (20.8)	7 (38.9)		
Normal involuted	15 (62.5)	5 (33.3)		
Thymectomy, n (%)	0	7 (38.9)		
Immunotherapy, n (%)				
None	24 (100)	5 (27.8)	-	-
CS	-	0	-	-
IS	-	13 (72.2)	-	-
CS and IS	-	0	-	-
Non-immune treatments, n (%)				
Pyridostigmine	19 (79.2)	6 (33.3)	-	-
APT	0	0	-	-

Categorical variables are presented as counts (%), while continuous variables are expressed as mean ± standard error of the mean (SEM). P values were determined using ordinary one-way ANOVA followed by Tukey's multiple comparisons test and Chi-square test. HC, healthy controls; nMG, immunotherapy-naïve myasthenia gravis; MMS, minimal clinical status; QMGs, quantitative MG scores; CS, corticosteroid; IS, non-steroidal immunosuppressants; APT, antiplatelet therapy.

Supplementary Table 7. Demographic and clinical characteristics of TEM samples

Characteristics	nMG (<i>n</i> =4)	MMS (<i>n</i> =4)	HC (<i>n</i> =4)	<i>p</i> value
Age (years)	56 ± 11.9	58.25 ± 9.18	57.25 ± 9.81	0.7749
Sex, female, n (%)	2 (50)	2 (50)	2 (50)	1.0
QMGs	10 ± 4.4	1.75 ± 2.21	-	-
Course (month)	11.5 ± 14.81	50.9 ± 40.5	-	-
MGFA				
I	1 (25)	-	-	-
IIa	1 (25)	-	-	-
IIb	0	-	-	-
IIIa	0	-	-	-
IIIb	0	-	-	-
IVa + IVb + V	2 (50)	-	-	-
Thymus, n (%)				
Thymoma	0	0	-	-
Hyperplasia	1 (25)	0	-	-
Normal involuted	3 (75)	4 (100)	-	-
Thymectomy, n (%)	0	0	-	-
Immunotherapy, n (%)				
None	4 (100)	0	-	-
CS	0	1 (25)	-	-
IS	0	2 (50)	-	-
CS and IS	0	1 (25)	-	-
Non-immune treatments, n (%)				
Pyridostigmine	4 (100)	1 (25)	-	-
APT	0	0	-	-

Categorical variables are presented as counts (%), while continuous variables are expressed as mean ± standard error of the mean (SEM). P values were determined using ordinary one-way ANOVA followed by Tukey's multiple comparisons test and Chi-square test. HC, healthy controls; nMG, immunotherapy-naïve myasthenia gravis; MMS, minimal clinical status; QMGs, quantitative MG scores; CS, corticosteroid; IS, non-steroidal immunosuppressants; APT, antiplatelet therapy.

Supplementary Table 8. Demographic and clinical characteristics of patients undergoing IVIg treatment before and after therapy

	Sex	Age (years)	Course (month)	Thymus	MGFA	Pre-IVIg		IVIg Concurrent Therapy	Post-IVIg	
						ADL	QMGs		ADL	QMGs
1	M	75-80	25	Normal involuted	IIIb	1	9	CS、MMF	1	9
2	M	70-75	4	Normal involuted	IIIb	10	18	None	10	18
3	F	75-80	40	Normal involuted	IIIa	2	12	CS	2	12
4	M	25-30	4	Thymoma	IIIb	12	24	None	12	24
5	F	30-35	106	Hyperplasia	IVa	6	18	None	6	18
6	F	50-55	7	Normal involuted	IVb	11	13	None	9	12

QMGs, quantitative MG scores; ADL, activities of daily living score; IVIg, intravenous immunoglobulin; CS, corticosteroid; MMF, mycophenolate mofetil.

Supplementary Table 9. Demographic and Clinical Characteristics of Patients in Platelet-Neutrophil Co-culture Studies

Characteristics	nMG (<i>n</i> =7)	MMS (<i>n</i> =7)	HC (<i>n</i> =7)	<i>p</i> value
Age (years)	50.71 ± 12.39	51.29 ± 12.56	52 ± 9.41	0.9815
Sex, female, <i>n</i> (%)	2 (28.57)	2 (28.57)	2(28.57)	1.0
QMGs	10.57 ± 4.33	1.29 ± 0.70	-	-
Course (month)	3.63 ± 3.31	109.14 ± 195.12	-	-
MGFA				
I	0	-	-	-
IIa	1 (14.29)	-	-	-
IIb	1 (14.29)	-	-	-
IIIa	1 (14.29)	-	-	-
IIIb	1 (14.29)	-	-	-
IVa + IVb + V	3 (42.86)	-	-	-
Thymus, <i>n</i> (%)				
Thymoma	1 (14.29)	1 (14.29)		
Hyperplasia	1 (14.29)	1 (14.29)		
Normal involuted	5 (71.43)	5 (71.43)		
Thymectomy, <i>n</i> (%)	0	1 (14.29)		
Immunotherapy, <i>n</i> (%)				
None	7 (100)	1 (14.29)	-	-
CS	0	2 (28.57)	-	-
IS	0	2 (28.57)	-	-
CS and IS	0	2 (28.57)	-	-
Non-immune treatments, <i>n</i> (%)				
Pyridostigmine	5 (71.43)	4 (57.14)	-	-
APT	0	0	-	-

Categorical variables are presented as counts (%), while continuous variables are expressed as mean ± standard error of the mean (SEM). P values were determined using ordinary one-way ANOVA followed by Tukey's multiple comparisons test and Chi-square test. HC, healthy controls; nMG, immunotherapy-naïve myasthenia gravis; MMS, minimal clinical status; QMGs, quantitative MG scores; CS, corticosteroid; IS, non-steroidal immunosuppressants; APT, antiplatelet therapy.

Supplementary Table 10. Demographic and Clinical Characteristics of Patients in Plasma NETs Analysis

Characteristics	nMG (<i>n</i> =25)	MMS (<i>n</i> =10)	HC (<i>n</i> =25)	<i>p</i> value
Age (years)	59.52 ± 14.56	59.7 ± 16.98	58 ± 13.04	0.9204
Sex, female, <i>n</i> (%)	13 (52)	6 (60)	13 (52)	0.887
QMGs	9.6 ± 5.94	1.9 ± 0.83	-	-
Course (month)	9.42 ± 10.53	126.66 ± 158.43	-	-
MGFA				
I	3 (12)	-	-	-
IIa	5 (2)	-	-	-
IIb	5 (2)	-	-	-
IIIa	3 (12)	-	-	-
IIIb	6 (24)	-	-	-
IVa + IVb + V	3 (12)	-	-	-
Thymus, <i>n</i> (%)				
Thymoma	7 (28)	2 (20)	-	-
Hyperplasia	6 (24)	1 (10)	-	-
Normal involuted	12 (48)	7 (70)	-	-
Thymectomy, <i>n</i> (%)	2 (8)	3 (30)	-	-
Immunotherapy, <i>n</i> (%)				
None	25 (100)		-	-
CS	0	4 (40)	-	-
IS	0	4 (40)	-	-
CS and IS	0	2 (20)	-	-
Non-immune treatments, <i>n</i> (%)				
Pyridostigmine	15 (6)	6 (60)	-	-
APT	0	0	-	-

Categorical variables are presented as counts (%), while continuous variables are expressed as mean ± standard error of the mean (SEM). P values were determined using ordinary one-way ANOVA followed by Tukey's multiple comparisons test and Chi-square test. HC, healthy controls; nMG, immunotherapy-naïve myasthenia gravis; MMS, minimal clinical status; QMGs, quantitative MG scores; CS, corticosteroid; IS, non-steroidal immunosuppressants; APT, antiplatelet therapy.

Supplementary Table 11. Demographic and clinical characteristics of platelets and CD4+ T cells co-culture samples

Characteristics	nMG (<i>n</i> =17)	MMS (<i>n</i> =17)	HC (<i>n</i> =17)	<i>p</i> value
Age (years)	55.3 ± 11.23	53.1 ± 10.27	54.5 ± 12.66	0.9204
Sex, female, n (%)	8 (47.1)	8 (47.1)	8 (47.1)	1.0
QMGs	9.44 ± 5.06	1.4 ± 1.43	-	-
Course (month)	15.67 ± 25.54	39.2 ± 49.54	-	-
MGFA				
I	0	-	-	-
IIa	4 (23.5)	-	-	-
IIb	2 (11.8)	-	-	-
IIIa	6 (35.3)	-	-	-
IIIb	2 (11.8)	-	-	-
IVa + IVB + V	3 (17.6)	-	-	-
Thymus, n (%)				
Thymoma	1 (5.9)	5 (29.4)	-	-
Hyperplasia	5 (29.4)	6 (35.3)	-	-
Normal involuted	11 (64.7)	6 (35.3)	-	-
Thymectomy, n (%)	0	8 (47.1)	-	-
Immunotherapy, n (%)				
None	17 (100)	4 (23.5)	-	-
CS	-	0	-	-
IS	-	13 (76.5)	-	-
CS and IS	-	0	-	-
Non-immune treatments, n (%)				
Pyridostigmine	12 (70.6)	4 (23.5)	-	-
APT	0	0	-	-

Categorical variables are presented as counts (%), while continuous variables are expressed as mean ± SEM. P values were determined using ordinary one-way ANOVA followed by Tukey's multiple comparisons test and Chi-square test. HC, healthy controls; nMG, immunotherapy-naïve myasthenia gravis; MMS, minimal clinical status; QMGs, Quantitative MG scores.

Supplementary Table 12. Demographic and clinical characteristics of participants in the cytokine neutralization experiment

Characteristics	nMG (<i>n</i> =10)	HC (<i>n</i> =10)	<i>p</i> value
Age (years)	53.57 ± 15.92	54.23 ± 16.28	0.8804
Sex, female, n (%)	7 (70)	7 (70)	1.0
QMGs	7 ± 4.34	-	-
Course (month)	6.14 ± 4.36	-	-
MGFA classification		-	-
I	0	-	-
IIa	0	-	-
IIb	2 (28.6)	-	-
IIIa	2 (28.6)	-	-
IIIb	3 (42.9)	-	-
IVa + IVb + V	0	-	-
Thymus, n (%)			
Thymoma	0	-	-
Hyperplasia	3 (30%)	-	-
Normal involuted	7 (70%)	-	-
Thymectomy, n (%)	0	-	-
Immunotherapy, n (%)	0	-	-
Non-immune treatments, n (%)			-
Pyridostigmine	8 (80)	-	-
APT	0	-	-

Categorical variables are presented as counts (%), while continuous variables are expressed as mean ± standard error of the mean (SEM). P values were determined using unpaired two-tailed Student's t-test and Chi-square test. HC, healthy controls; nMG, immunotherapy-naïve myasthenia gravis; MMS, minimal clinical status; QMGs, quantitative MG scores; CS, corticosteroid; IS, non-steroidal immunosuppressants.

Supplementary Table 13. Marker genes for cell type identification

Cell types	Markers
platelets	PPBP
CD4 Tm	CD4、CCR7 ^{med} 、FASLG、IFNG、CD44 ^{hi} 、FAS、CCR6 ⁻
CD4 Naïve	CD3E、CD4、CCR7、IL7R、TRAC、TRDV2、TRGV
Memory CD4 T	IL7R、S100A4、CD44、IFNG、GPR198
CD8 CTL	CD3E、CD8A、GZMB、GNLY
CD8 Tem	CD3E、CD8A、GZMK、FASLG、CD44、FAS
CD8 Naïve	CD3E、CD8A、CCR7、SELL
$\gamma\delta$ T	TRGV9+、TRDV2+
NK	NKG7、NCAM1、GNLY、FCGR3A(CD16)、KLRC1、KLRD1
CD14 MC	CD14 ^{high} 、CD16 ⁻ 、LYZ
CD16 MC	CD14 ^{+/-} 、CD16 ^{high} 、MS4A7
Naïve B	MS4A1(CD20)、IL4R、IGHD
Memory B	CD27、IGHG1
Plasma	MZB1
cDCs	CD1c
pDCs	CLEC4C