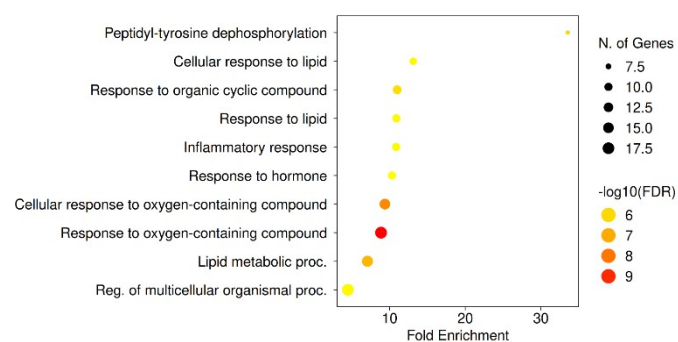
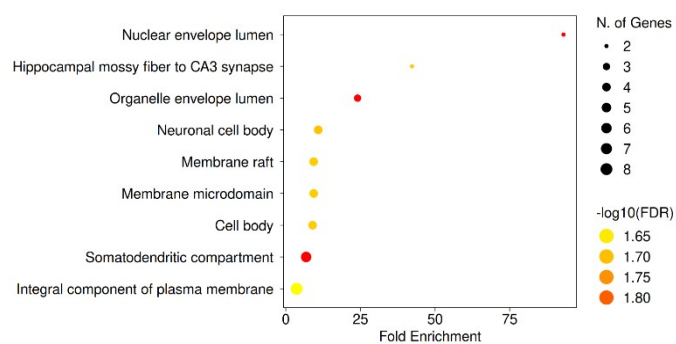
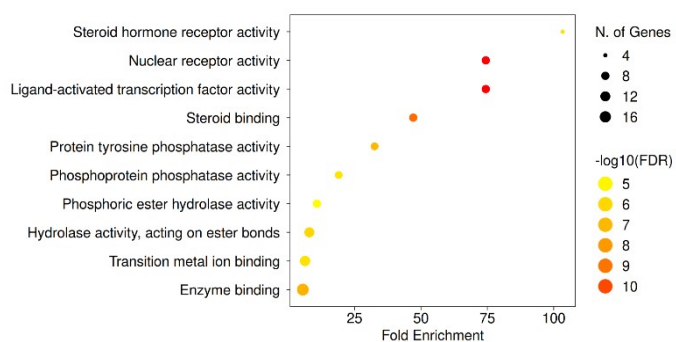




A



B



C

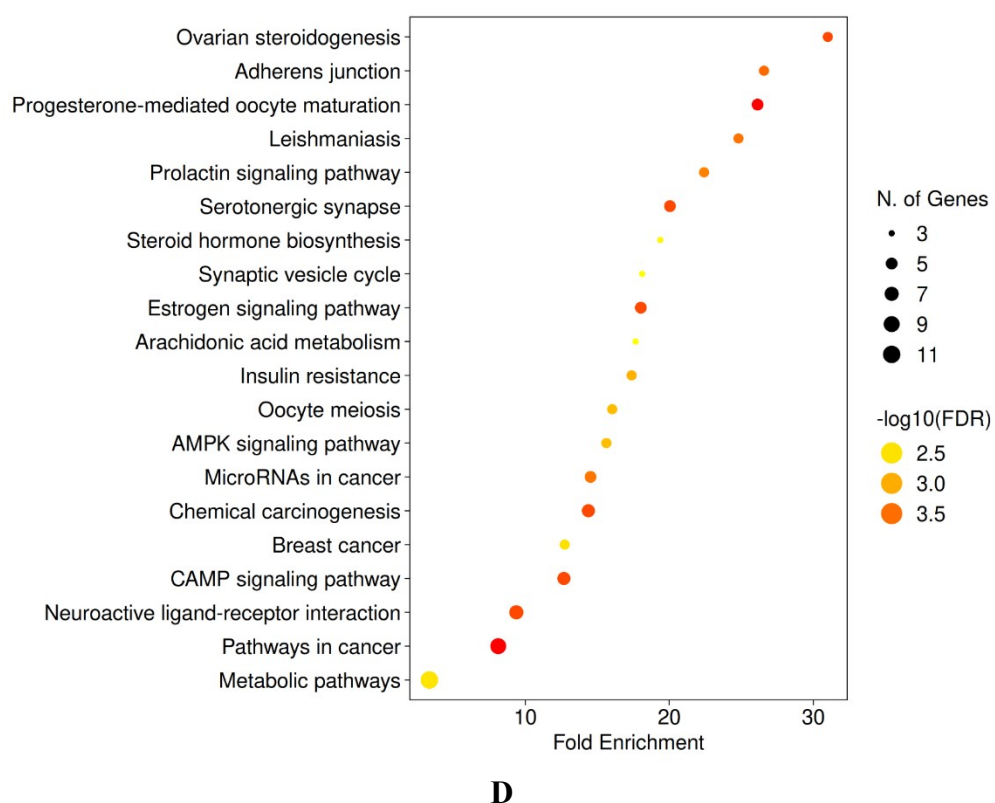


Fig. S1 Enrichment analysis for gene ontology. (A) Biological process. (B) Molecular function. (C) Cellular component (D) KEGG Pathway.

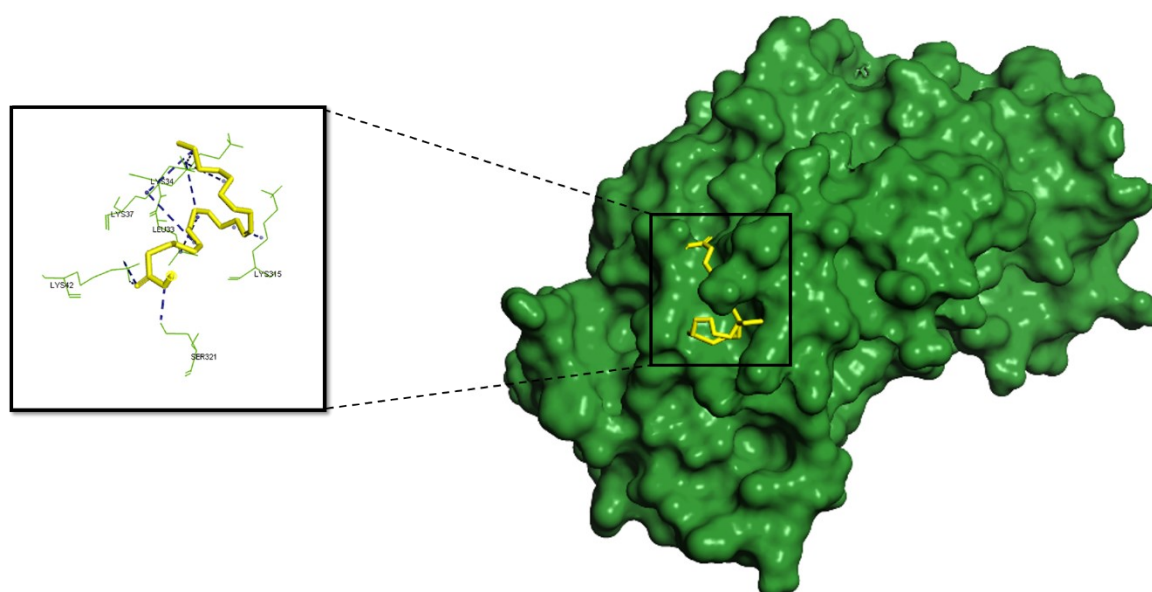


Fig. S2 Amino acid interactions formed between erucic acid and IFN- γ (PDB ID: 1D9C).

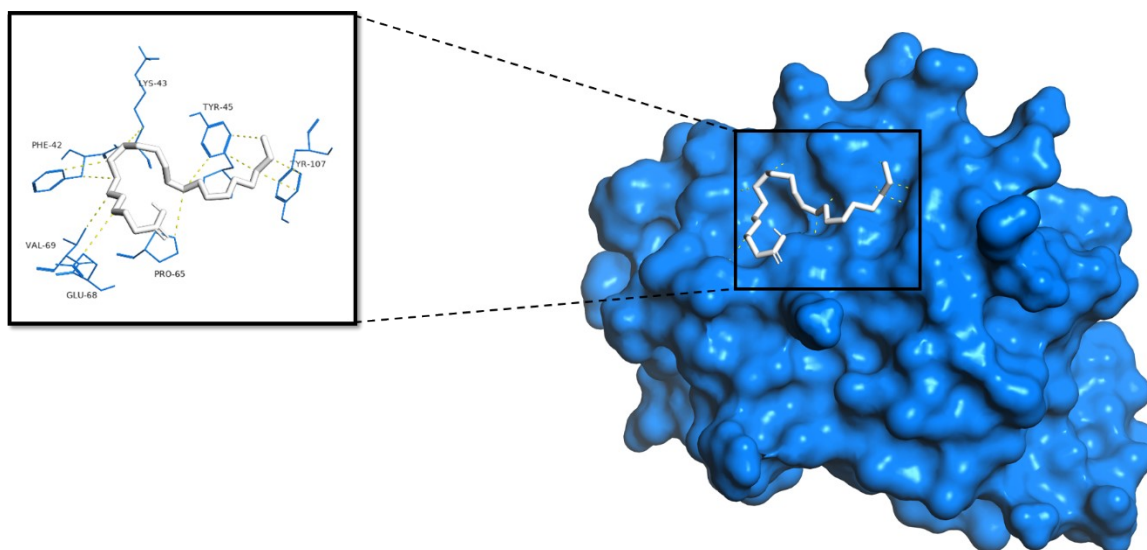


Fig. S3 Amino acid interactions formed between erucic acid and IL-2 (PDB ID: 1M47).

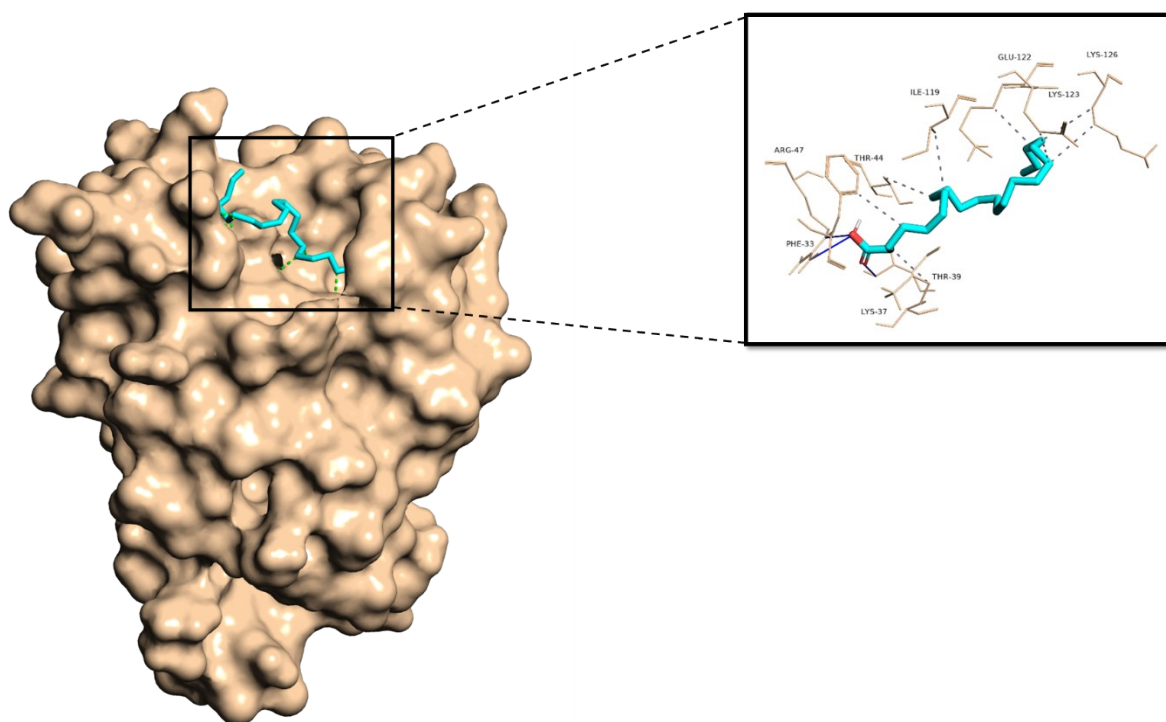


Fig. S4 Amino acid interactions formed between erucic acid and IL-4 (PDB ID: 2B8U).

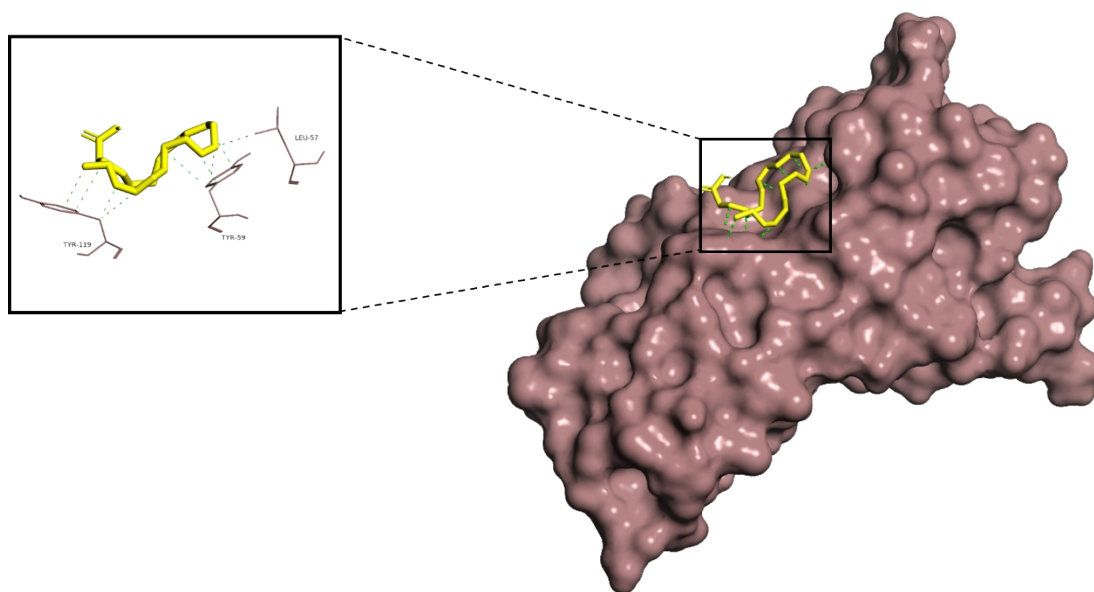


Fig. S5 Amino acid interactions formed between erucic acid and TNF- α (PDB ID: 2AZ5).

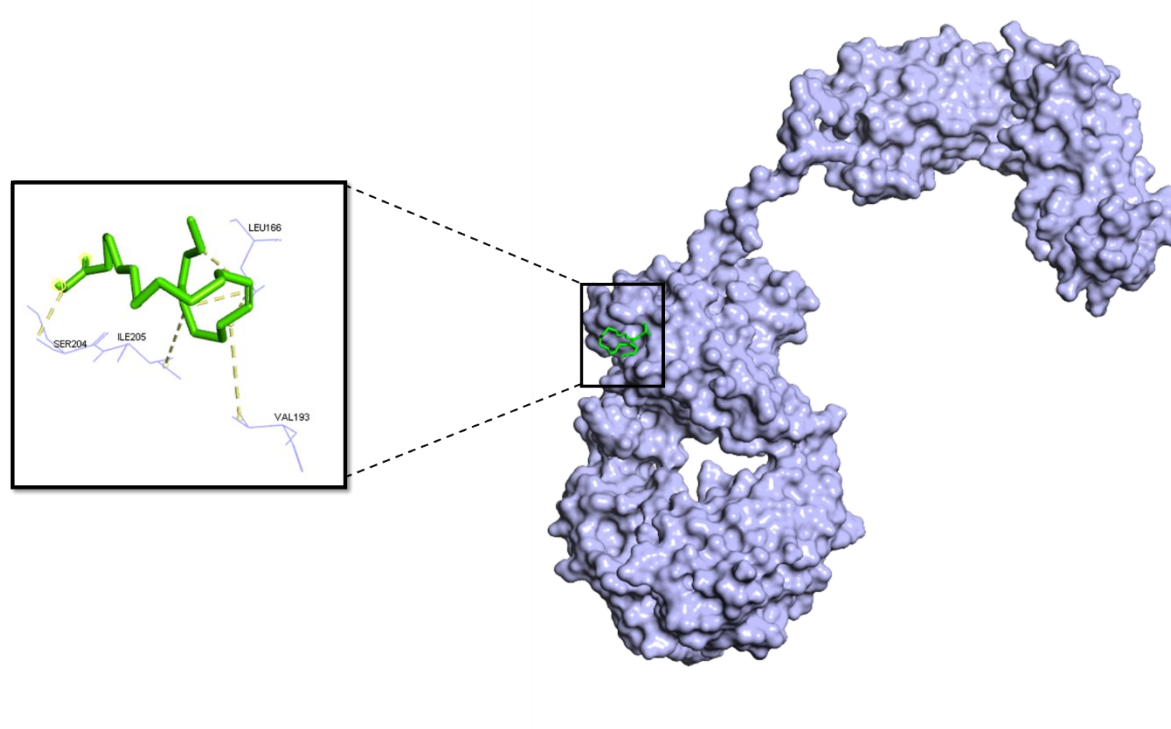


Fig. S6 Amino acid interactions formed between erucic acid and IgG (PDB ID: 1IGT).

Table S1: Immune organ indices, hematological markers, cytokines, immunoglobulin levels, oxidative stress markers, and antioxidant enzymes in control and treated groups

Parameter	Control	Cyclophosphamide	Cyclophosphamide + EA-10	Cyclophosphamide + EA-20	Cyclophosphamide + Levamisole-20	EA-20 Per se
Spleen index (mg/g)	7.26 ± 0.75	3.04 ± 0.21#	6.03 ± 0.71*	6.63 ± 0.60**	7.21 ± 0.57**	7.31 ± 0.87
Thymus index (mg/g)	3.60 ± 0.32	1.50 ± 0.21#	2.81 ± 0.23*	3.00 ± 0.22**	3.33 ± 0.18***	3.59 ± 0.41
Lymphocytes (%)	100.0 ± 3.28	37.50 ± 3.07#	58.33 ± 3.44*	61.67 ± 3.44**	69.83 ± 5.57***	100.3 ± 5.99
WBCs (10³/μL)	6.00 ± 0.28	2.53 ± 0.30#	4.33 ± 0.30*	4.72 ± 0.29**	4.88 ± 0.30***	6.14 ± 0.58
RBCs (10⁶/μL)	9.33 ± 0.63	4.33 ± 0.69#	7.63 ± 0.51*	8.07 ± 0.73**	8.67 ± 0.76***	9.32 ± 1.12
IFN-γ (ng/mg)	3.50 ± 0.19	1.80 ± 0.19#	2.97 ± 0.24*	3.28 ± 0.22**	3.38 ± 0.24**	3.60 ± 0.36
TNF-α (pg/mL)	105.0 ± 5.56	52.00 ± 5.56#	79.00 ± 5.56*	87.00 ± 5.56**	95.00 ± 5.56***	105.1 ± 6.93
IL-2 (pg/mL)	25.00 ± 1.70	9.17 ± 1.61#	18.00 ± 1.70*	20.00 ± 1.70**	21.00 ± 1.70**	26.31 ± 2.29
IL-4 (pg/mL)	80.00 ± 3.14	43.00 ± 4.05#	60.00 ± 2.69*	64.17 ± 3.85**	66.67 ± 3.33***	80.81 ± 4.36
IL-6 (pg/mL)	48.00 ± 3.15	20.00 ± 3.15#	36.50 ± 3.78*	40.00 ± 3.15**	42.00 ± 3.15***	48.27 ± 3.46
IgG (pg/mL)	12.00 ± 0.54	4.70 ± 0.54#	8.33 ± 0.71*	9.03 ± 0.87**	9.38 ± 0.90**	12.42 ± 1.14
NO (μmol/g)	0.10 ± 0.01	0.24 ± 0.01#	0.17 ± 0.01*	0.15 ± 0.01**	0.14 ± 0.01***	0.10 ± 0.01
MDA (nmol/mg)	1.42 ± 0.16	4.88 ± 0.41#	3.30 ± 0.26*	3.03 ± 0.21**	2.56 ± 0.20***	1.49 ± 0.38
SOD (U/mg)	12.53 ± 0.50	5.55 ± 0.52#	9.20 ± 0.86*	10.22 ± 1.02**	11.65 ± 0.33***	12.85 ± 1.34
GSH (μmol/g)	9.28 ± 0.38	3.13 ± 0.35#	5.73 ± 0.39*	6.45 ± 0.46**	7.45 ± 0.54***	9.24 ± 1.03
CAT (U/mg)	86.77 ± 3.43	44.95 ± 3.16#	65.88 ± 3.93*	69.52 ± 3.75**	72.82 ± 3.66***	87.13 ± 5.66

EA: Erucic acid; WBCs: White blood cells; RBCs: Red blood cells; IFN- γ : Interferon gamma; TNF- α : Tumor necrosis factor alpha; IL-2: Interleukin-2; IL-4: Interleukin-4; IL-6: Interleukin-6; IgG: Immunoglobulin G; NO: Nitric oxide; MDA: Malondialdehyde; SOD: Superoxide dismutase; GSH: Glutathione; CAT: Catalase.

Values are expressed in mean $\pm$ S.E.M. (n = 6). A one-way ANOVA followed by Tukey's post hoc test, #P < 0.001 vs. control, *P < 0.05, **P < 0.01, ***P < 0.001 vs. Cyclophosphamide.