Online supplementary figures

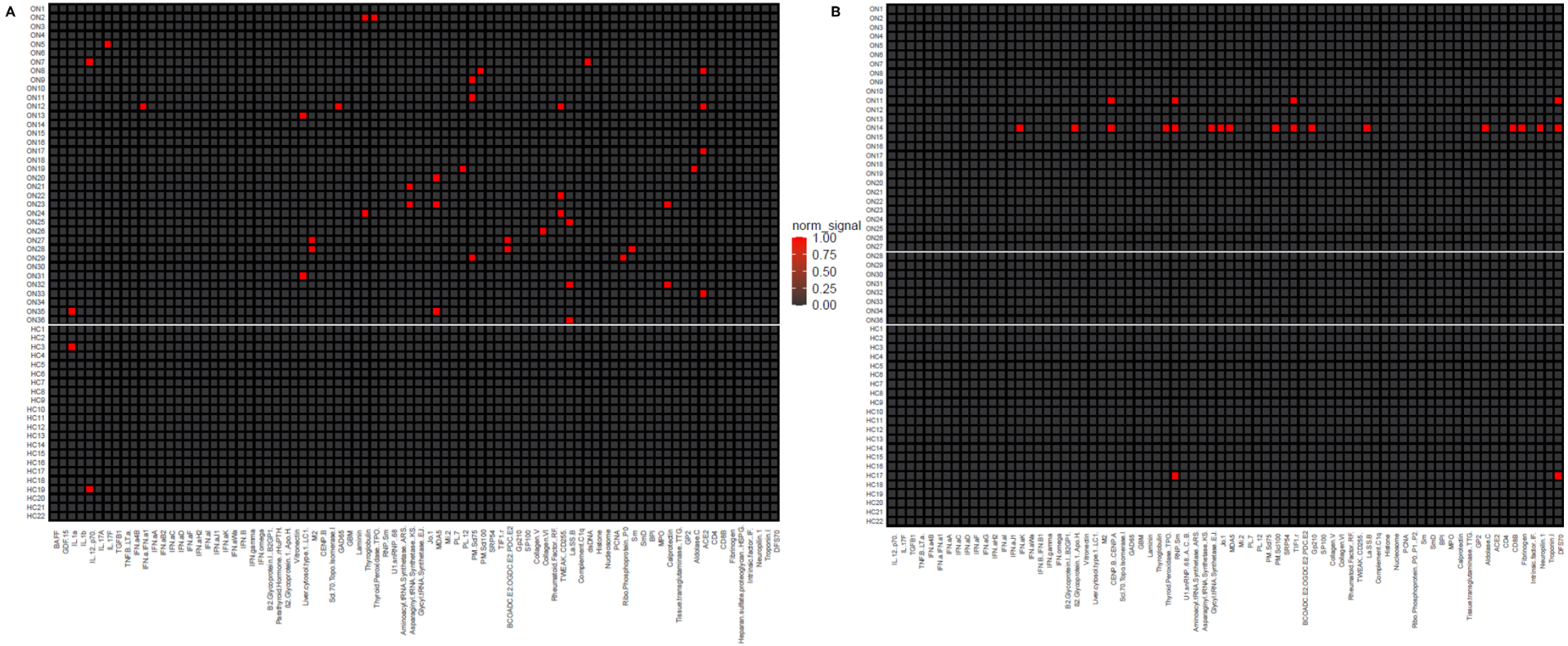

Figure E1. Microarray Autoantibody Profiling

Serum IgG (A) and IgM (B) antibody reactivities against 102 autoantigens were assessed. Positivity was calculated for each autoantigen based on the median + 3SD in the age-sex matched health control group, denoted by HC

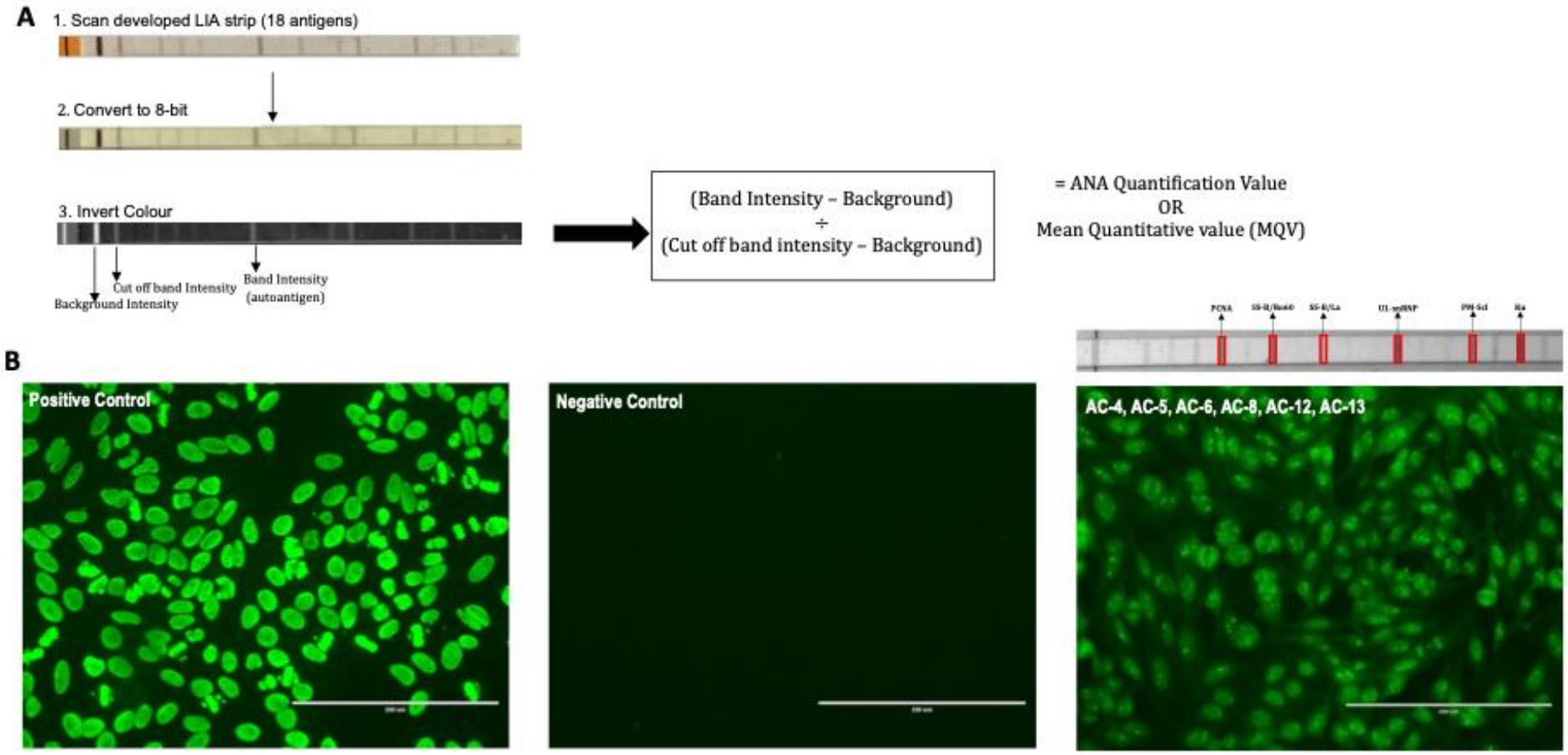

Figure E2. Validation of ANA/ENA Quantification Using Rapid Assessment Strips

(A) A scan of the rapid line immunoassay was converted into 8-bit and inverted to visualize band intensity. The fluorescence of each band was normalized to the background and cut-off band intensity to obtain the mean quantitative value (MQV). (B) HEp-2 cells were stained with sera of post-COVID patients and evaluated for anti-cell staining patterns as outlined by the International Consensus on Antinuclear Antibody (ANA) Patterns (ICAP). The patterns were then compared to positive ANA reactivities on the line immunoassay to confirm reliability and consistency of results.

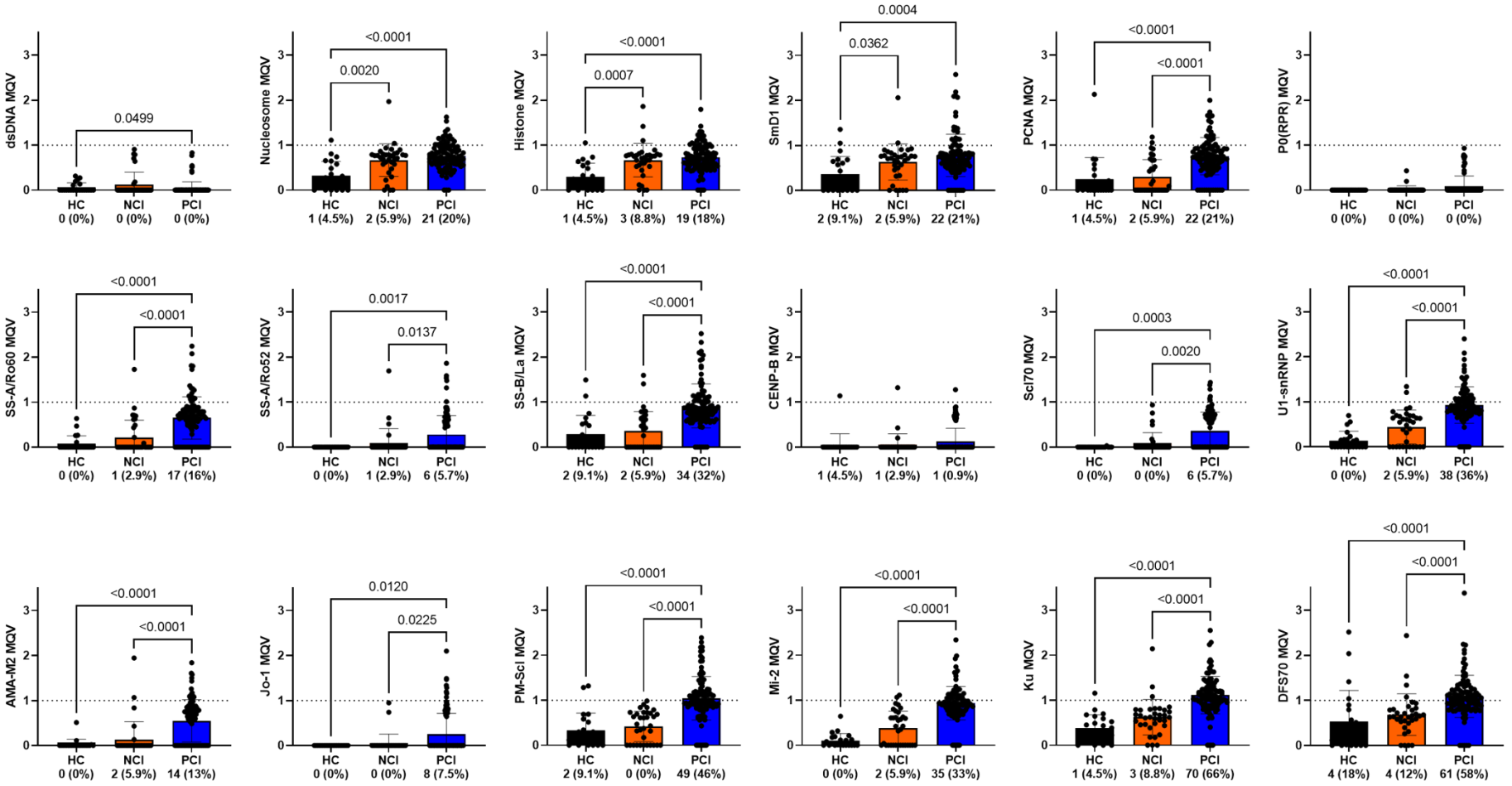

Figure E3. Differential Antinuclear Antibody Signatures at 3 Months Post-Recovery

Statistical analysis was performed with Kruskal-Wallis test with Dunn's multiple comparisons to assess difference between healthy controls (n=22), non-COVID infection controls (n=34), and post-COVID patients (n=106) at 3 months post-infection.

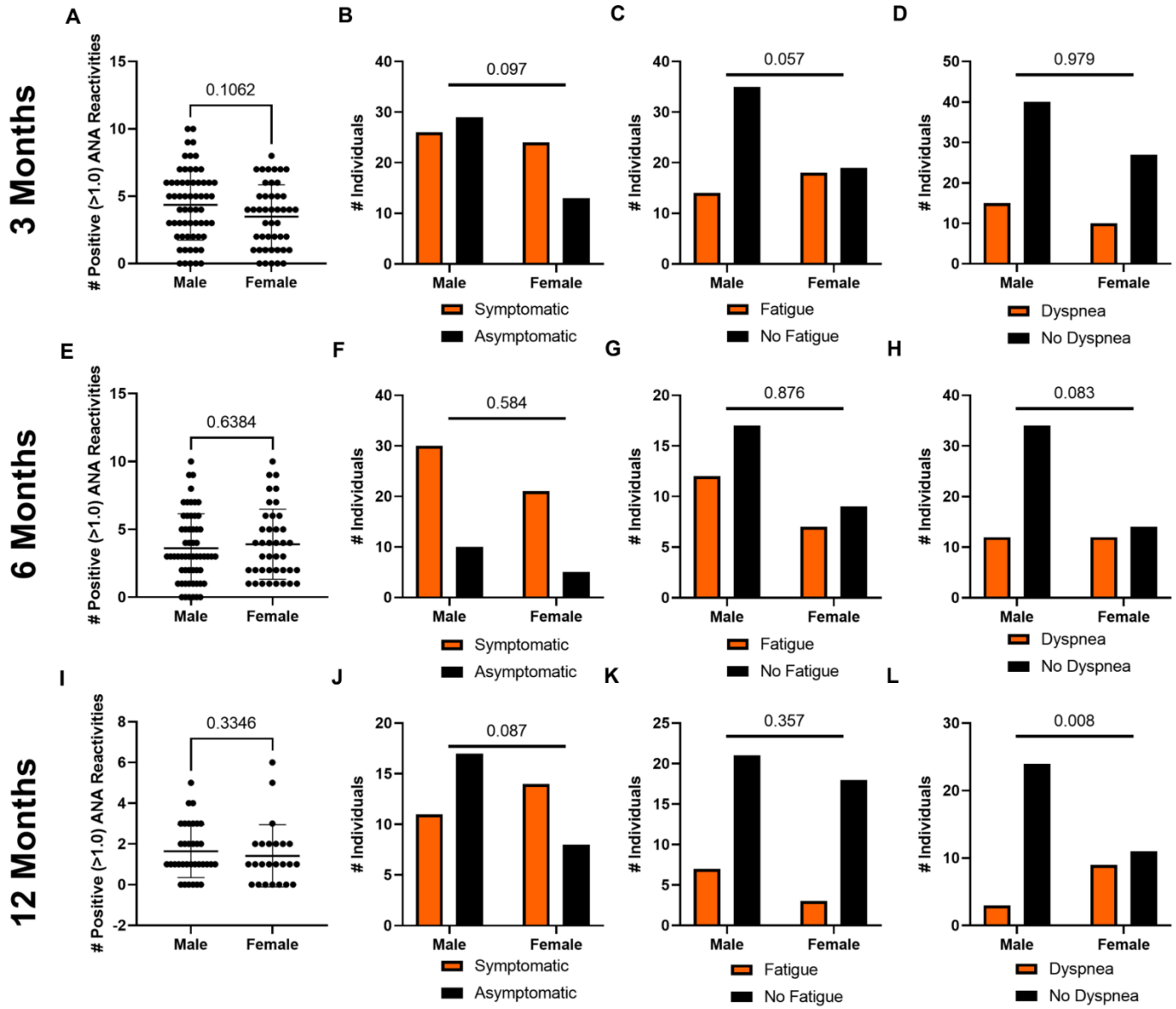

Figure E4. Impact of Sex on PASC Autoimmunity and Symptomaticity

(A) The frequency of positive ANA reactivities in our PCI cohort stratified by sex. Chi-squared analysis was conducted to evaluate the impact of sex on (B) symptomaticity, (C) fatigue, and (D) dyspnea at 3 months (A-D), 6 months (E-H) and 12 months (I-L) Significance was determined as $P<0.05$.

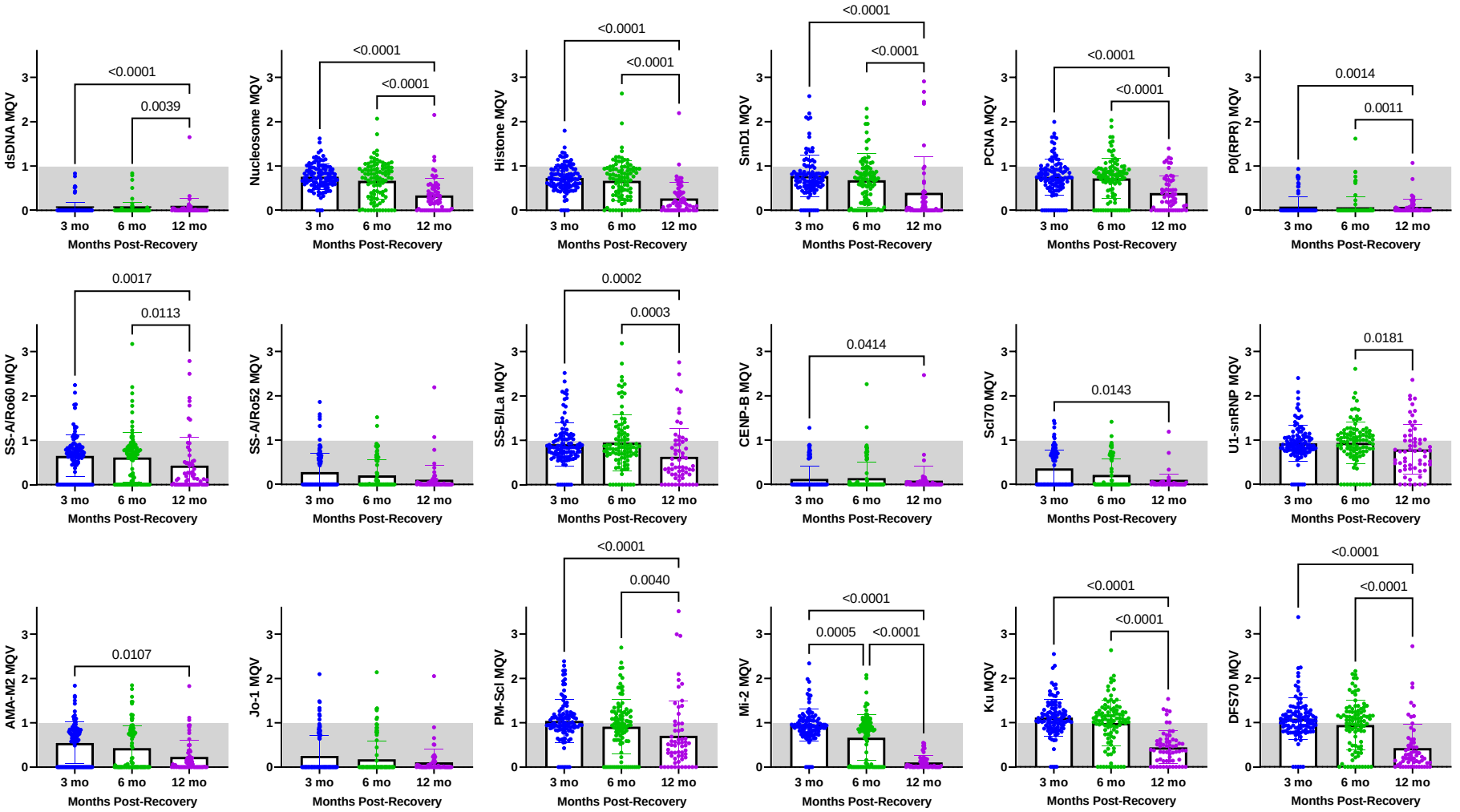

Figure E5. Differential Antinuclear Antibody Signatures at 3, 6, and 12 Months Post-Recovery

Statistical analysis was performed with Kruskal-Wallis test with Dunn's multiple comparisons to assess differences in circulating autoantibodies in patients at 3 months (n=106), 6 months (n=98), and 12 months (n=58) post-recovery.

Table E1. Inflammatory Mediators Associated with Prevalent ANAs and Symptomaticity at 12 Months Post-COVID

Multiple Logistic Regression Analysis: Cytokines vs ANAs – 12 Months						
Cytokine	**Predicted ANA**	**ANA Prevalence at 12 Months**	**Estimate**	**Standard Error**	**Z-Score**	**P-Value**
TNFα	SS-A/Ro60	12%	2.449	1.436	1.71	0.088
TNFα	U1-snRNP	30%	1.306	0.771	1.69	0.091
IL-6	PCNA	9%	4.166	1.824	2.28	0.022
IL-8	DFS70	12%	4.631	2.667	1.74	0.083
IL-8	PM-Scl	21%	-2.527	1.253	-2.02	0.044
CRP	PM-Scl	21%	2.122	1.219	1.74	0.082
CRP	SmD1	11%	4.329	2.605	1.66	0.097
VCAM-1	Ku	11%	3.9456	2.109	1.87	0.061
Multiple Logistic Regression Analysis: Cytokines vs Symptoms						
Cytokine	**Predicted Symptom**	**Timepoint**	**Estimate**	**Standard Error**	**Z-Score**	**P-Value**
D-dimer	Fatigue	3 months	1.010	0.395	2.56	0.011
ICAM-1	Cough		1.136	0.518	2.19	0.028
D-dimer	Dyspnea		0.553	0.245	2.26	0.024
D-dimer	Any Symptom		1.305	0.536	2.44	0.015
TNFα*	Fatigue	12 months	4.645	2.018	2.30	0.021
TNFα*	Any Symptom		2.399	1.105	2.17	0.030

A multiple regression analysis was performed to determine predictive power of cytokines on ANA reactivity at 12 months with significance set as $P<0.1$. All significantly predicted ANAs had a prevalence between 9-30% at 12 months post-COVID. In addition, a multiple regression analysis was conducted to determine if cytokines predict symptomaticity at each timepoint.

Table E2. Impact of Comorbidities on PASC Autoimmunity and Symptomaticity

Patient Comorbidity at 12 Months	**# (%)** N=57	**Avg. #aAbs w/ Comorb.**	**Avg. #aAbs w/o Comorb.**	**P-Value**	**Cough**	**P-Value**	**Fatigue**	**P-Value**	**Dyspnea**	**P-Value**
Cardiovascular	30 (53%)	1.5	1.7	0.8912	8/28	0.3062	5/28	0.7317	4/28	0.0922
Respiratory	11 (19%)	2.5	1.4	0.0916	4/9	0.0928	3/9	0.3636	4/9	0.1995
Gastrointestinal	6 (11%)	2.2	1.5	0.7298	0/6	0.3168	2/6	0.5859	2/6	0.6210
Endocrine	12 (21%)	2	1.5	0.2529	1/11	0.4162	2/11	>0.9999	4/11	0.4267
Renal	8 (14%)	2.1	1.5	0.1162	3/8	0.3506	4/8	**0.0407**	3/8	0.3858
Others	8 (14%)	2.3	1.5	0.2115	1/7	>0.9999	3/7	0.1326	2/7	>0.9999

The frequency of positive ANA reactivities in our post-COVID cohort at 12 months stratified by pre-existing comorbidities. Kruskal-Wallis test was conducted to determine whether comorbidities affected the autoimmune profile in our post-COVID population. Additionally, chi-squared analysis was performed to evaluate the impact of comorbidities on our symptoms at 12 months post-recovery. Significance was determined for all analyses as $P<0.05$.