

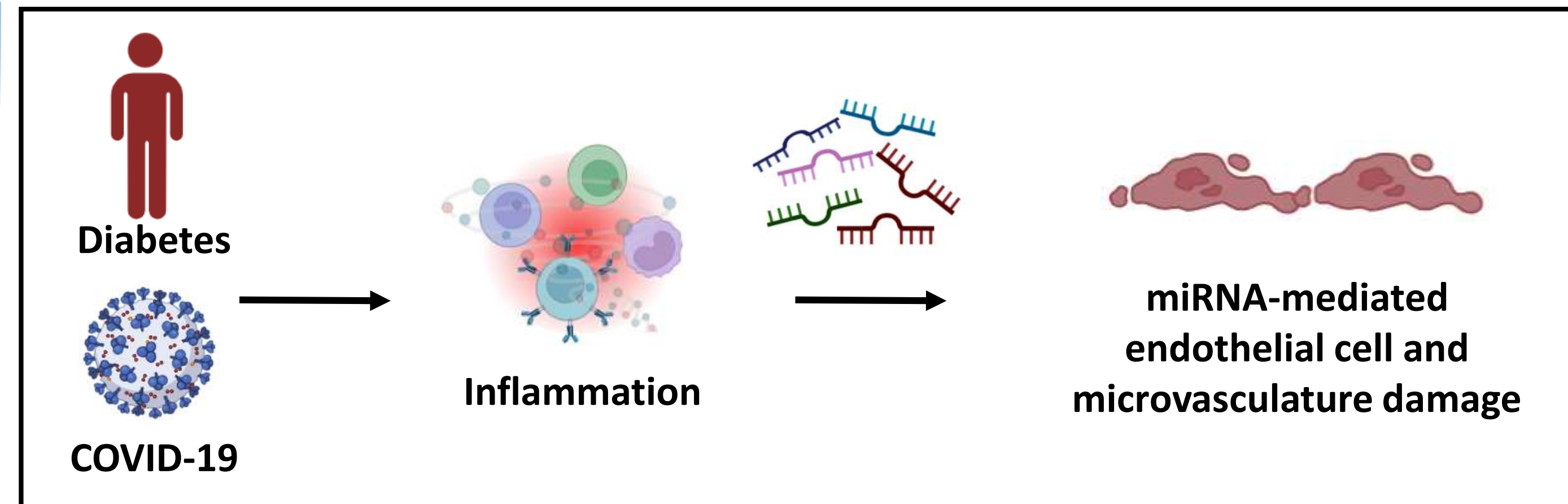
Effect of SARS-CoV-2 infection on rETinal structure in patients with diAbetes meLlitus.

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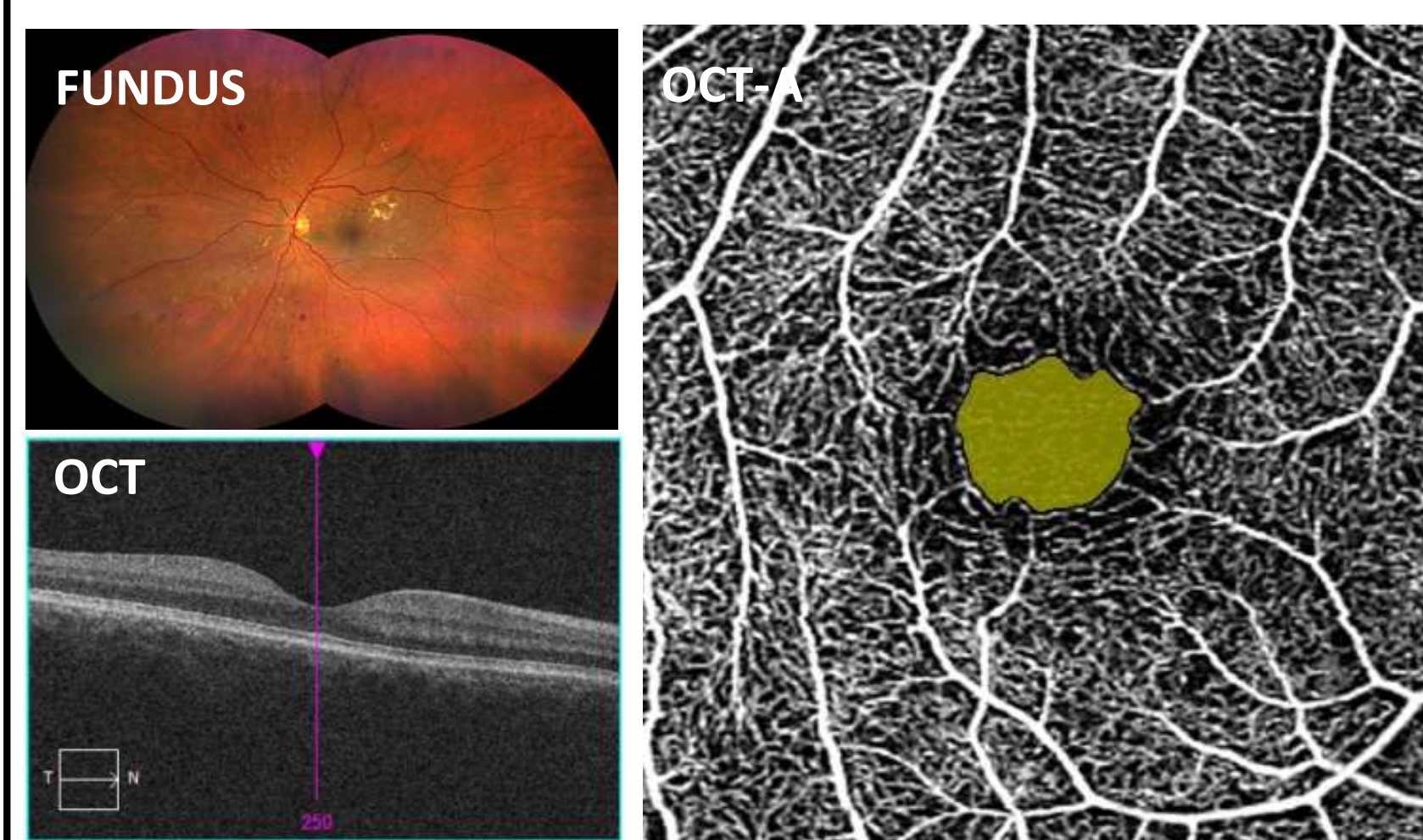
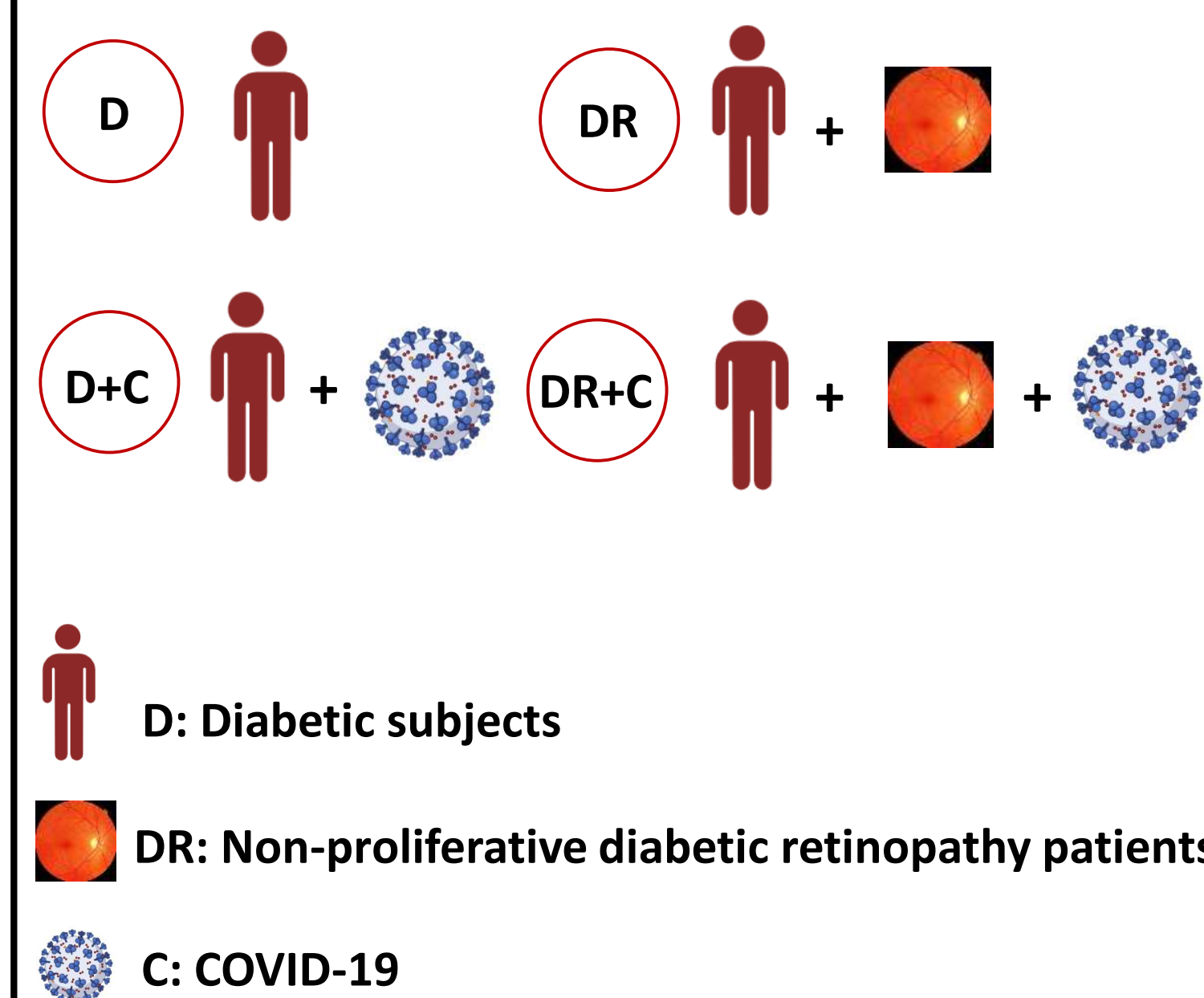
Design of Study: Prospective cross-sectional study.

Purpose: SARS-CoV-2 infection has long-term consequences on body homeostasis, mostly through an imbalance of the inflammatory response and endothelial cell damage. Here, we studied the association between COVID-19 and retinal microvascular structure in subjects with diabetes and collected data on inflammatory microRNAs.

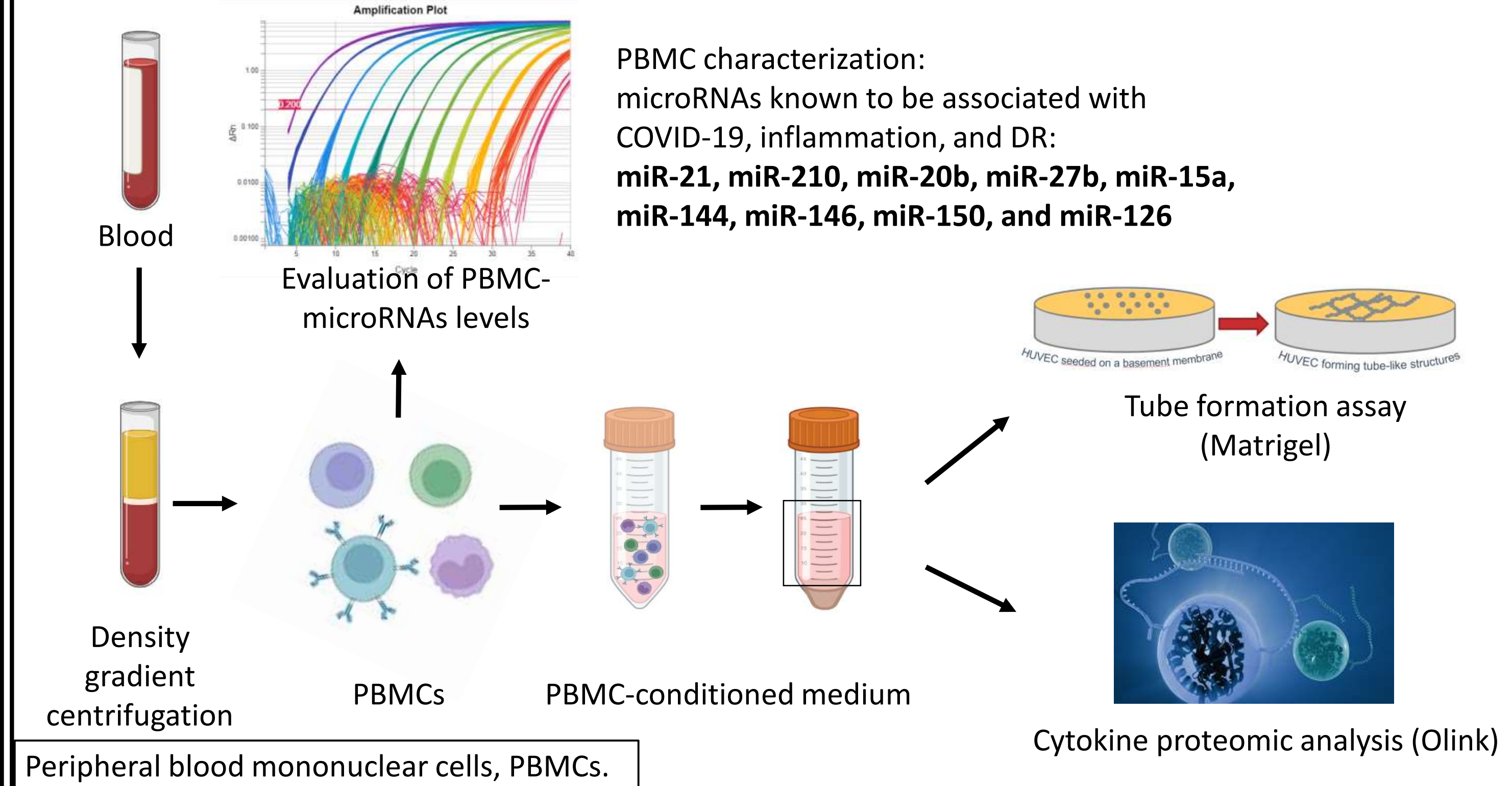


METHODS

Study design:



Complete ophthalmological evaluation, fundus, macular OCT/angio-OCT with Zeiss AngioPlex Cirrus 5000. Central macular thickness (CMT), foveal avascular zone (FAZ) area, perimeter and circularity index (CI), vessel density (VD%), and perfusion density (PD%) were automatically calculated on a 3x3 mm fovea scan on the superficial capillary plexus (SCP).



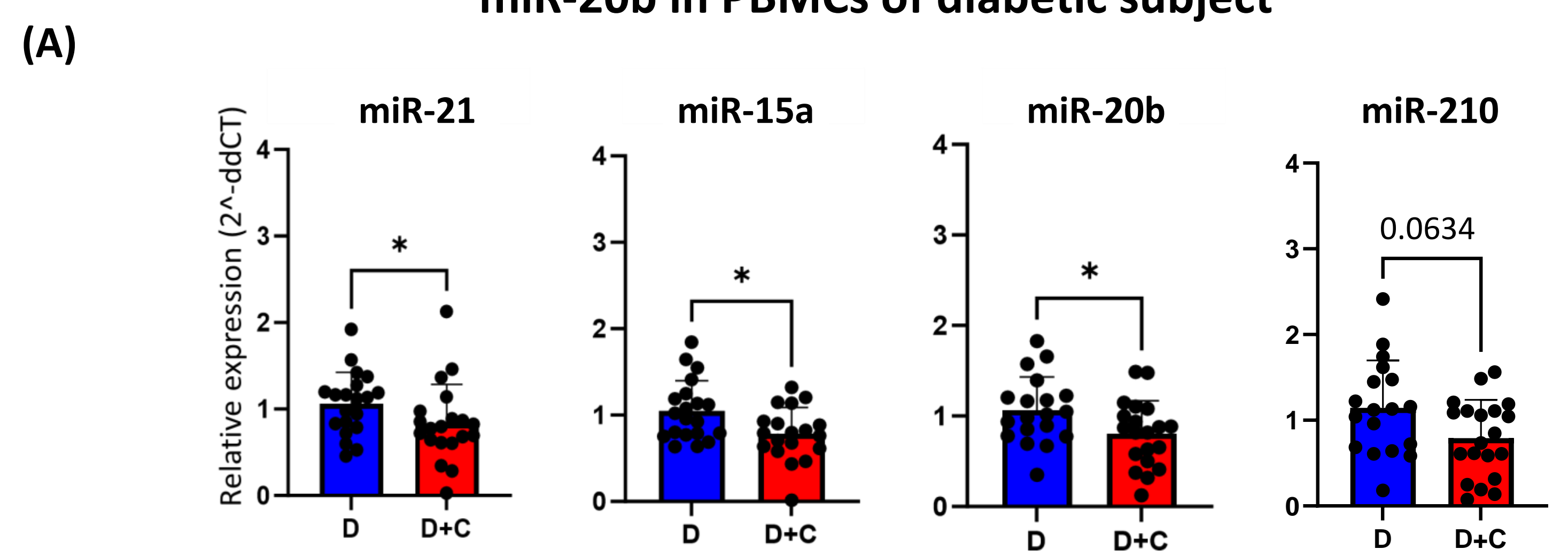
RESULTS

Table. Enrolled subject characteristics and ophthalmic data

Variables	Without COVID-19 (N=64)	With COVID-19 (N=28)	p-value
Time since COVID-19 (months)- mean ± SD	N.A.	14.64 ± 8.96	N.E.
Age (years) - mean ± SD	65.75 ± 9.06	67.43 ± 10.91	0.4216
Sex (% of females)	29.69	21.43	0.4126
BMI (kg/m ²) - mean ± SD	28.09 ± 3.88	28.79 ± 4.93	0.5639
HbA1c (%) - mean ± SD	6.99 ± 1.13	7.3 ± 1.47	0.3936
Vaccine (n° doses) - mean ± SD	3.22 ± 0.55	3.04 ± 0.59	0.207
BCVA (ETDRS SCORE) - mean ± SD	84.26 ± 1.57	83.67 ± 2.14	0.2526
CMT (µm) - mean ± SD	265.33 ± 27.75	266.04 ± 29.49	0.5695
FAZ SCP Area (mm ²) - mean ± SD	0.29 ± 0.14	0.26 ± 0.1	0.2857
FAZ SCP perimeter (mm) - mean ± SD	2.39 ± 0.71	2.39 ± 0.55	0.9238
FAZ SCP circularity Index (AU) - mean ± SD	0.6 ± 0.12	0.56 ± 0.12	0.2692
PD SCP central (%) - mean ± SD	16.77 ± 6.03	17.17 ± 6.81	1.000
PD SCP Inner (%) - mean ± SD	36.09 ± 3.47	35.5 ± 4.68	0.883
PD SCP full (%) - mean ± SD	33.92 ± 3.45	33.45 ± 4.76	0.8656
VD SCP central (%) - mean ± SD	10.08 ± 4.78	9.85 ± 4	0.9238
VD SCP inner (%) - mean ± SD	20.35 ± 3.8	19.34 ± 3.1	0.5462
VD SCP full (%) - mean ± SD	19.22 ± 3.83	18.32 ± 3.11	0.6589

Body mass index, BMI; glycated hemoglobin, HbA1c; best corrected visual acuity, BCVA; central macular thickness, CMT, foveal avascular zone, FAZ; superficial capillary plexus, SCP; perfusion density, PD; vessel density (VD).

COVID-19 is associated with a significant downregulation of miR-21, miR-15a and miR-20b in PBMCs of diabetic subject



COVID-19 combined with DR correlates with a significant downregulation of miR-21, miR-20b and miR-210 in PBMCs

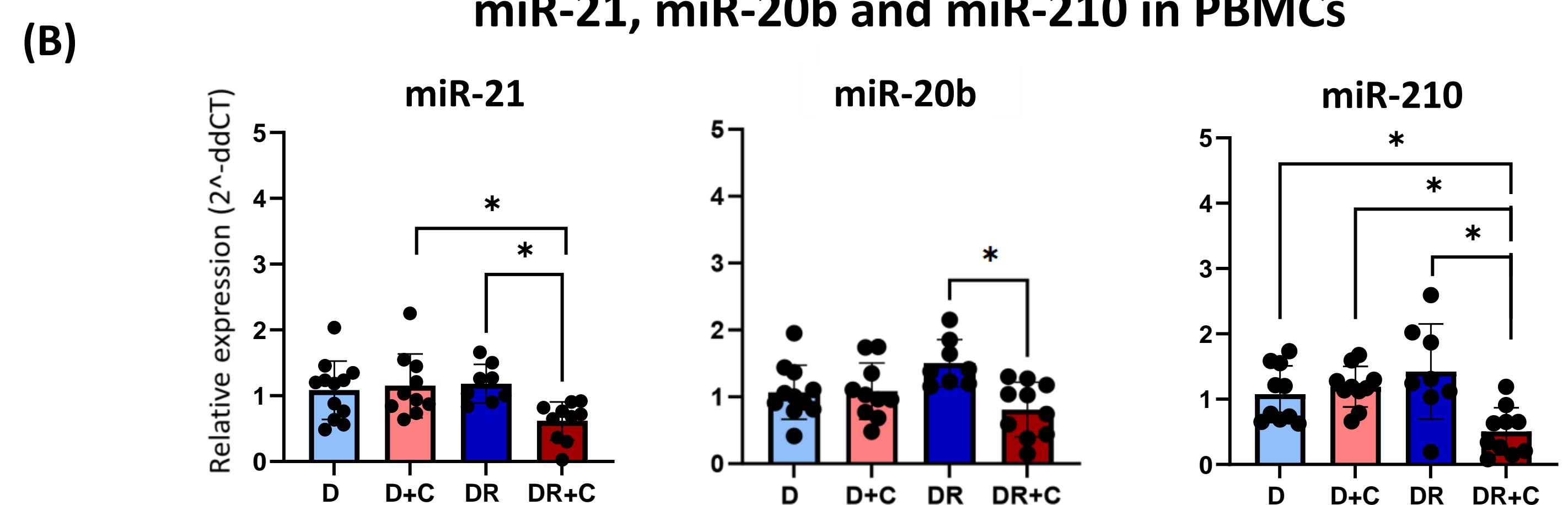
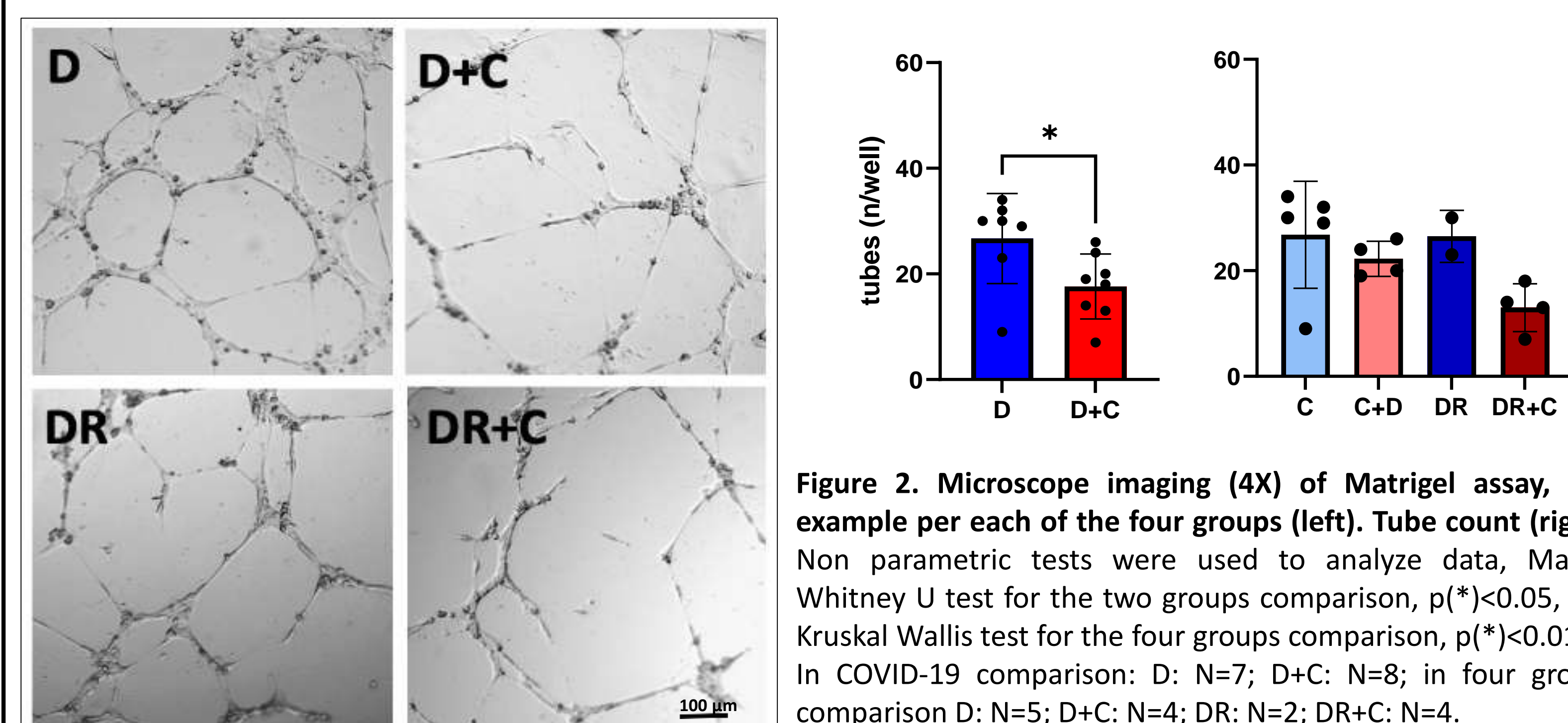
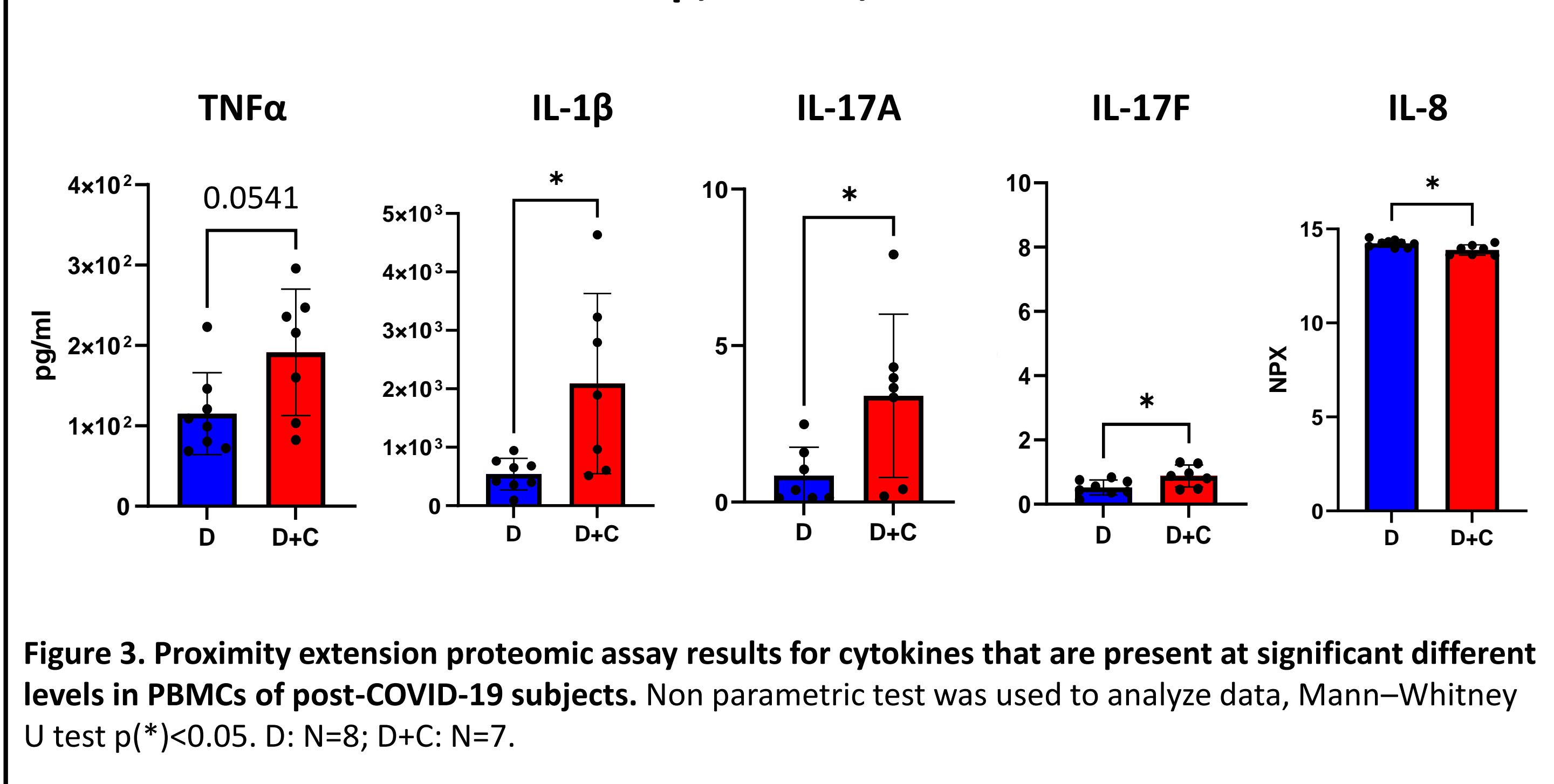


Figure 1. PBMC-miRNAs expression stratifying patients based on COVID-19 (A) and DR presence (B). In COVID-19 comparison the data were analyzed with non parametric, Mann-Whitney U test, $p(*) < 0.05$. D: N=20; D+C: N=20 (A). For multiple comparison data were analyzed with Kruskal Wallis $(*) < 0.0125$. D: N=12; D+C: N=10; DR: N=8; DR+C: N=10 (B).

Conditioned medium of PBMCs derived from COVID-19 patients inhibits angiogenesis



Conditioned medium of PBMCs derived from COVID-19 patients is enriched in IL-1β, IL-17A, IL-17F and IL-8



CONCLUSIONS: In patients with diabetes, we observed dramatic changes in PBMCs inflammatory miRNA levels and released cytokines that may contribute to endothelial cell impairment post-COVID-19. A larger cohort of patients will be required to assess associated retinal microvascular alterations.