

***N,N'*-Diphenyl-1,4-phenylenediamine Antioxidant's Potential Role in Enhancing the Pancreatic Antioxidant, Immunomodulatory, and Anti-Apoptotic Therapeutic Capabilities of Adipose-Derived Stem Cells in Type I Diabetic Rats**

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Table S1. Serum glucose, insulin, C-peptide, and HbA1c levels.

		Control	DPPD	Diabetic (D)	D + DPPD	D + ADMSCs	D + AD-MSCs+DPPD
Glucose (mg/ 100 ml)	Mean	92.83	93.33	395.20	174.20	133.66	105.50
	±SEM	± 3.14	± 4.28	±14.33 ^a	±5.24 ^{ab}	±4.65 ^{ab}	±5.17 ^{bc}
	%				-55.92	-66.17	-73.30
Insulin (µ I U/ml)	Mean	17.10	17.20	8.16	14.37	15.47	16.90
	±SEM	± 0.53	± 0.61	±0.37 ^a	±0.42 ^{ab}	± 1.05 ^{ab}	±0.56 ^{bc}
	%				+76.10	+89.58	+107.10
C-peptide (ng/ml)	Mean	0.87	0.84	0.31	0.75	0.81	0.86
	±SEM	± 0.02	± 0.03	± 0.01 ^a	± 0.03 ^{ab}	± 0.02 ^{ab}	± 0.03 ^{bc}
	%				+141.93	+161.29	+177.41
HbA1c (%)	Mean	2.90	3.13	4.94	3.65	3.10	2.92
	±SEM	± 0.13	± 0.12	± 0.22 ^a	± 0.10 ^{ab}	± 0.12 ^{ab}	± 0.11 ^{bc}
	%				- 26.11	- 37.24	- 40.89

Values expressed as ± SEM (n = 6). ^{a,b & c} are Significant differences ($P \leq 0.05$) compared to control, diabetic untreated and DPPD-diabetic treated groups, respectively. % is the percent of change compared to the diabetic group.

Table S2. Pancreatic OS and antioxidant markers levels.

		Control	DPPD	Diabetic (D)	D + DPPD	D + AD-MSCs	D + AD-MSCs+DPPD
MDA (n mol/g)	Mean	10.30	10.36	29.84	18.08	13.00	11.50
	±SEM	± 0.32	± 0.28	± 1.16	±1.32 ^{ab}	± 0.08 ^{ab}	± 1.05 ^{bc}
	%				-39.41	-56.43	-61.46
H ₂ O ₂ (mM/g)	Mean	0.83	0.89	1.98	1.25	1.10	0.90
	±SEM	± 0.02	± 0.03	± 0.06 ^a	±0.02 ^{ab}	± 0.02 ^{ab}	± 0.02 ^{bc}
	%				-36.86	-44.44	-54.54
AGEs (AU/mg protein)	Mean	2.62	2.53	8.50	6.11	4.07	2.44
	±SEM	± 0.14	±0.15	± 0.33 ^a	± 0.14 ^{ab}	± 0.17 ^{ab}	± 0.12 ^{bc}
	%				-28.11	-52.11	-71.29
XO (U/mg)	Mean	21.40	22.33	49.00	31.66	26.00	23.13
	±SEM	± 1.04	± 1.02	± 2.52 ^a	±1.39 ^{ab}	± 1.13 ^{ab}	± 1.08 ^{bc}
	%				-35.38	-46.93	-52.79
GSH (mg/g)	Mean	55.00	53.00	20.56	36.50	44.00	53.60
	±SEM	± 2.24	± 2.13	± 1.82 ^a	±2.36 ^{ab}	± 2.64 ^{ab}	± 2.93 ^{bc}
	%				+77.52	+114.00	+160.70
SOD (U/g)	Mean	11.33	11.10	4.56	7.60	9.08	10.80
	±SEM	± 0.25	± 0.22	± 0.17 ^a	±0.43 ^{ab}	± 0.43 ^{ab}	± 0.32 ^{bc}
	%				+66.66	+99.12	+136.84
CAT (U/g)	Mean	0.58	0.62	0.33	0.46	0.51	0.56
	±SEM	± 0.03	± 0.04	± 0.01 ^a	±0.04 ^{ab}	± 0.03 ^{ab}	± 0.03 ^{bc}
	%				+39.39	+54.54	+69.69
GST (U/mg)	Mean	6.15	6.13	2.60	5.50	5.70	6.02
	±SEM	± 0.11	± 0.13	± 0.12 ^a	±0.29 ^{ab}	± 0.22 ^{ab}	± 0.21 ^{bc}
	%				+111.53	+119.23	+131.53
TAC (mg/g)	Mean	1.77	1.83	0.55	1.20	1.40	1.60
	±SEM	± 0.06	± 0.02	± 0.02 ^a	±0.07 ^{ab}	± 0.03 ^{ab}	± 0.05 ^{bc}
	%				+118.18	+154.54	+190.90
HO-1 (U/mg)	Mean	311.00	307.00	116.00	235.00	288.00	306.00
	±SEM	± 11.34	±12.38	± 4.28 ^a	±7.39 ^{ab}	± 9.76 ^{ab}	± 10.12 ^{bc}
	%				+102.58	+148.27	+163.79

Values expressed as ± SEM (n = 6). ^{a,b & c} are Significant differences ($P \leq 0.05$) compared to control, diabetic untreated and DPPD-diabetic treated groups, respectively. % is the percent of change compared to the diabetic group.

Table S3. Serum CRP, TGF- β , CD95, and IL-6 levels.

		Control	DPPD	Diabetic (D)	D + DPPD	D + ADMSCs	D + AD-MSCs+DPPD
CRP (g/dl)	Mean	3.50	3.40	18.16	8.00	4.50	3.80
	\pm SEM	± 0.11	± 0.09	$\pm 0.54^a$	$\pm 0.26^{ab}$	$\pm 0.32^{ab}$	$\pm 0.28^{bc}$
	%				-55.94	-75.22	-79.07
TGF- β (%)	Mean	17.00	18.50	46.30	32.60	26.50	20.50
	\pm SEM	± 0.82	± 0.63	$\pm 2.17^a$	$\pm 1.82^{ab}$	$\pm 1.82^{ab}$	$\pm 1.03^{bc}$
	%				-29.58	-42.76	-55.72
CD95 ⁺ (%)	Mean	27.20	26.80	50.50	39.50	33.90	30.60
	\pm SEM	± 1.34	± 1.45	$\pm 2.77^a$	$\pm 1.22^{ab}$	$\pm 1.93^{ab}$	$\pm 1.68^{bc}$
	%				-21.78	-32.87	-39.40
IL-6 (%)	Mean	21.55	21.10	49.00	41.55	34.55	23.80
	\pm SEM	± 1.76	± 1.76	$\pm 2.34^a$	$\pm 1.38^{ab}$	$\pm 1.38^{ab}$	$\pm 1.72^{bc}$
	%				-15.20	-29.48	-51.42

Values expressed as \pm SEM (n = 6). ^{a,b & c} are Significant differences ($P \leq 0.05$) compared to control, diabetic untreated and DPPD-diabetic treated groups, respectively. % is the percent of change compared to the diabetic group.

Table S4. Pancreatic T-Helper (CD 4⁺) and T-Cytotoxic (CD 8⁺) %.

		Control	DPPD	Diabetic (D)	D + DPPD	D + AD-MSC	D + AD-MSCs+DPPD
	Mean	24.60	25.90	56.20	40.10	31.70	18.50
CD4⁺	±SEM	± 1.10	±1.22	± 3.15 ^a	±1.32 ^{ab}	± 1.58 ^{ab}	± 1.16 ^{bc}
(%)	%				-28.64	-43.59	-67.08
	Mean	31.60	31.40	58.50	47.60	40.20	33.30
CD8⁺	±SEM	± 1.25	±1.85	± 2.35 ^a	±1.74 ^{ab}	± 1.22 ^{ab}	± 1.54 ^{bc}
(%)	%				-18.63	-31.28	-43.07

Values expressed as ± SEM (n = 6). ^{a,b & c} are Significant differences ($P \leq 0.05$) compared to control, diabetic untreated and DPPD-diabetic treated groups, respectively. % is the percent of change compared to the diabetic group.

Table S5. Pancreatic P53, caspase 3, & Bcl-2 %.

		Control	DPPD	Diabetic (D)	D + DPPD	D + AD-MSCs	D + AD-MSCs+DPPD
P53	Mean	12.00	13.00	61.50	33.50	23.50	12.50
	±SEM	± 1.21	± 1.45	± 5.63 ^a	± 2.26 ^{ab}	± 1.98 ^{ab}	± 1.33 ^b
	%				-45.52	-99.16	-79.67
Caspase 3	Mean	34.50	32.50	80.50	59.25	50.50	39.00
	±SEM	± 2.42	± 3.22	± 4.71 ^a	± 3.93 ^{ab}	± 3.26 ^{ab}	± 2.37 ^b
	%				-26.39	-37.26	-51.55
Bcl-2	Mean	48.50	47.50	12.50	27.00	35.55	43.30
	±SEM	± 2.19	± 2.16	± 0.27 ^a	±1.24 ^{ab}	± 1.27 ^{ab}	± 1.62 ^b
	%				+116.00	+184.40	+246.40

Values expressed as ± SEM (n = 6). ^{a,b & c} are Significant differences (P ≤ 0.05) compared to control, diabetic untreated and DPPD-diabetic treated groups, respectively. % is the percent of change compared to the diabetic group.

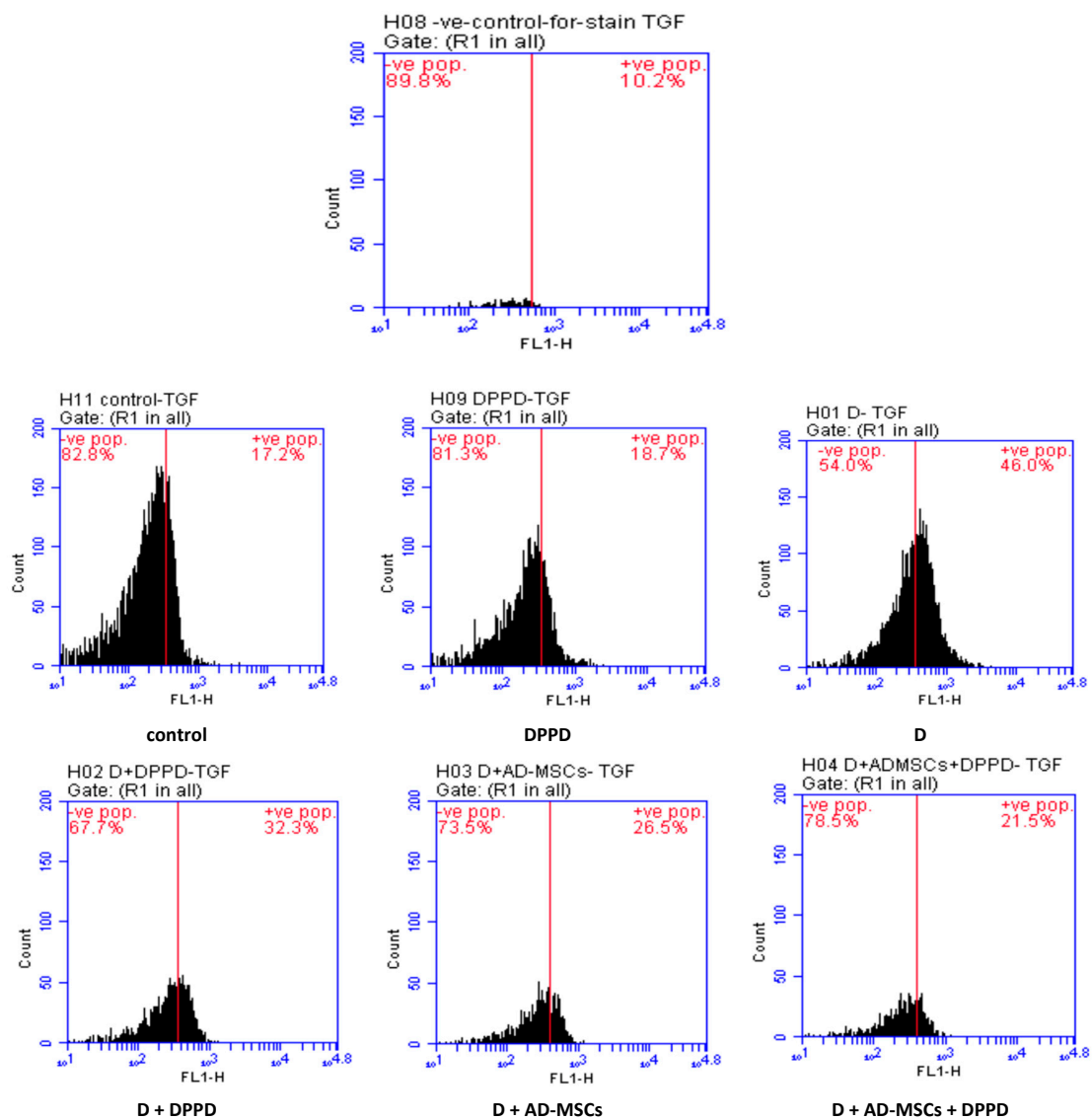


Figure S1a. Pancreatic TGF- β %

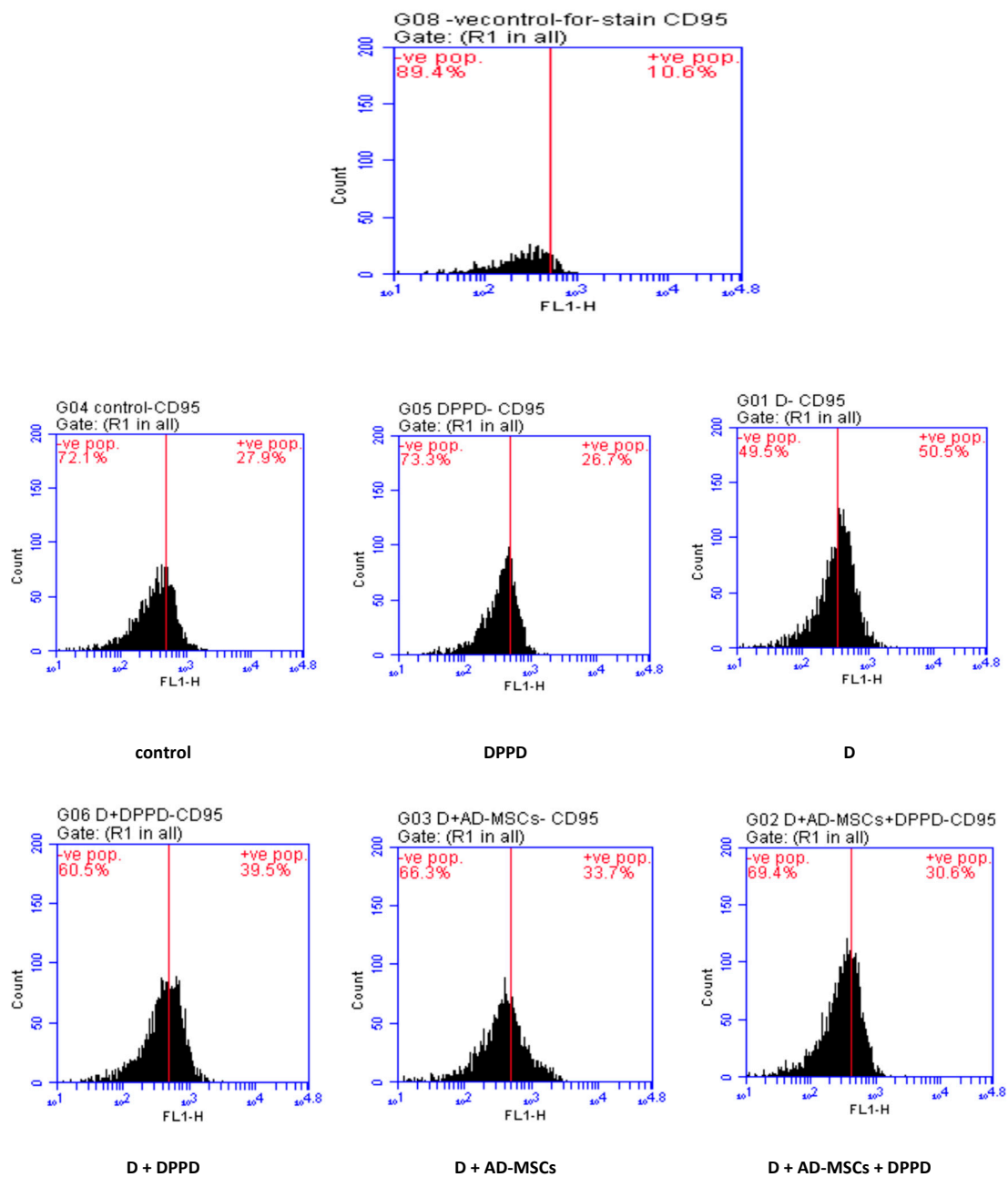


Figure S1b. Pancreatic CD95+ %.

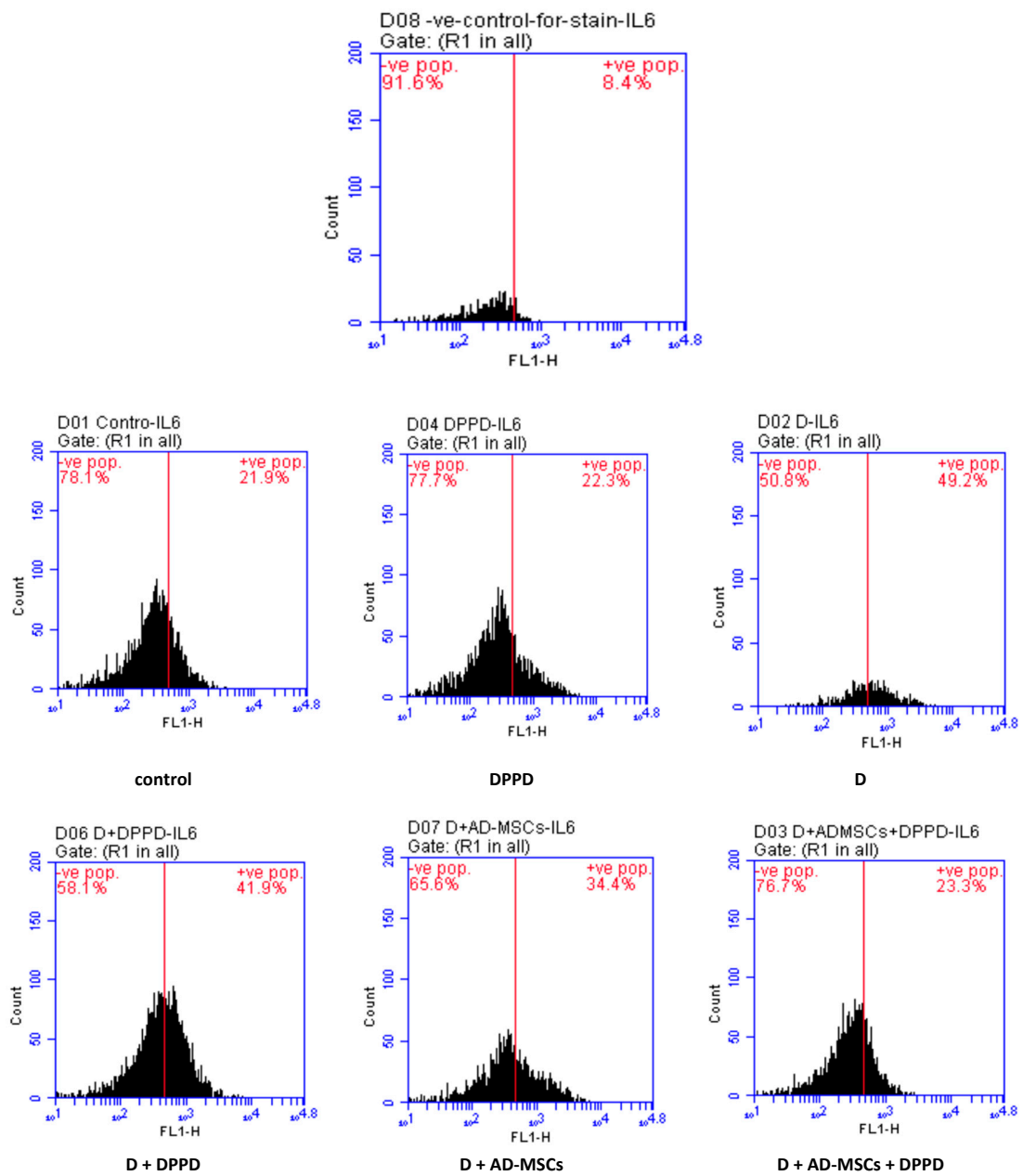


Figure S1c. Pancreatic IL-6 %

Figure S1 (a-c). Pancreatic TGF- β , CD95, and IL-6 levels.

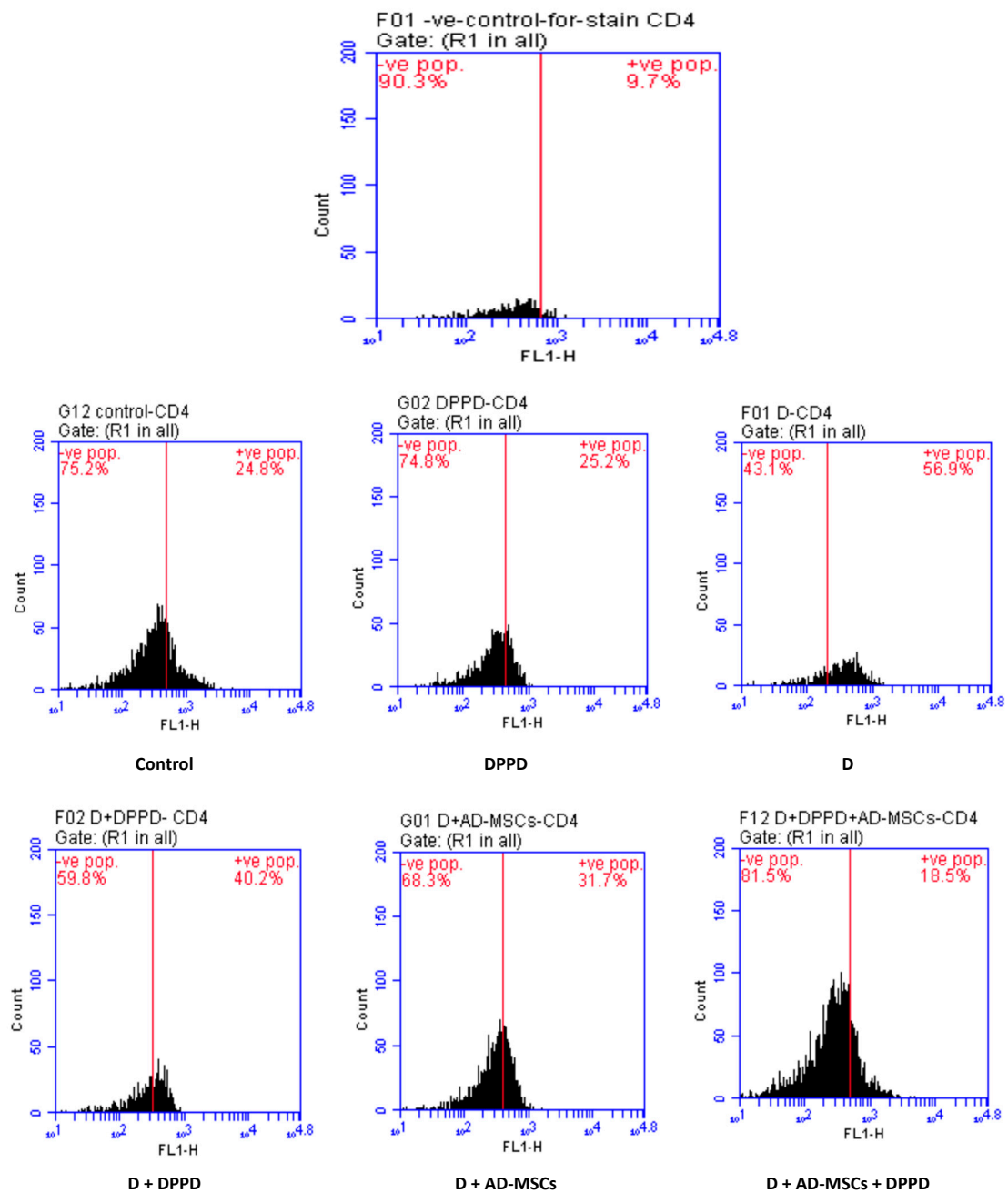


Figure S2a. Pancreatic CD4+ %.

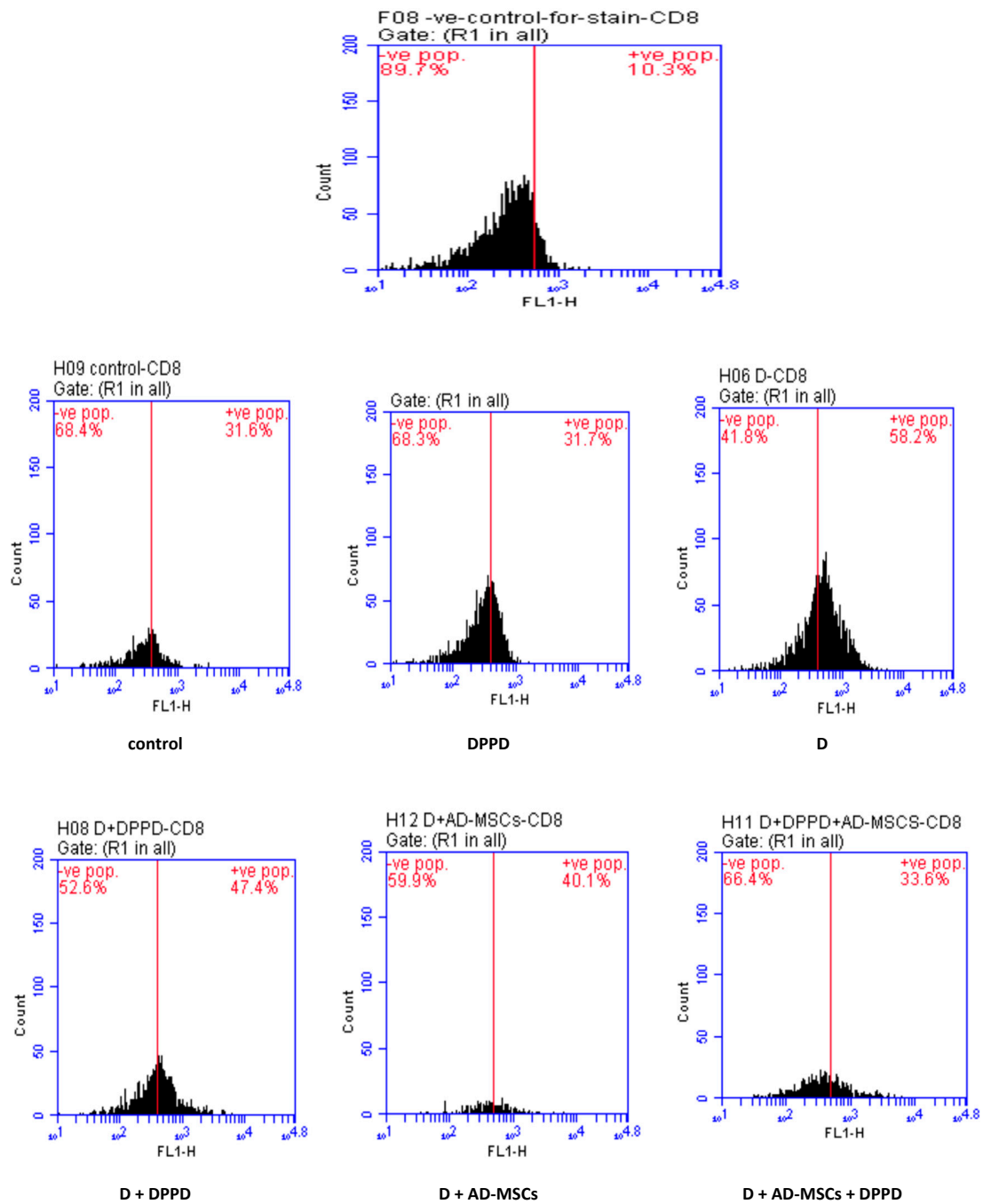


Figure S2b. Pancreatic CD8+ %.

Figure S2 (a-b). Pancreatic T-Helper (CD 4⁺) and T-Cytotoxic (CD 8⁺) %.

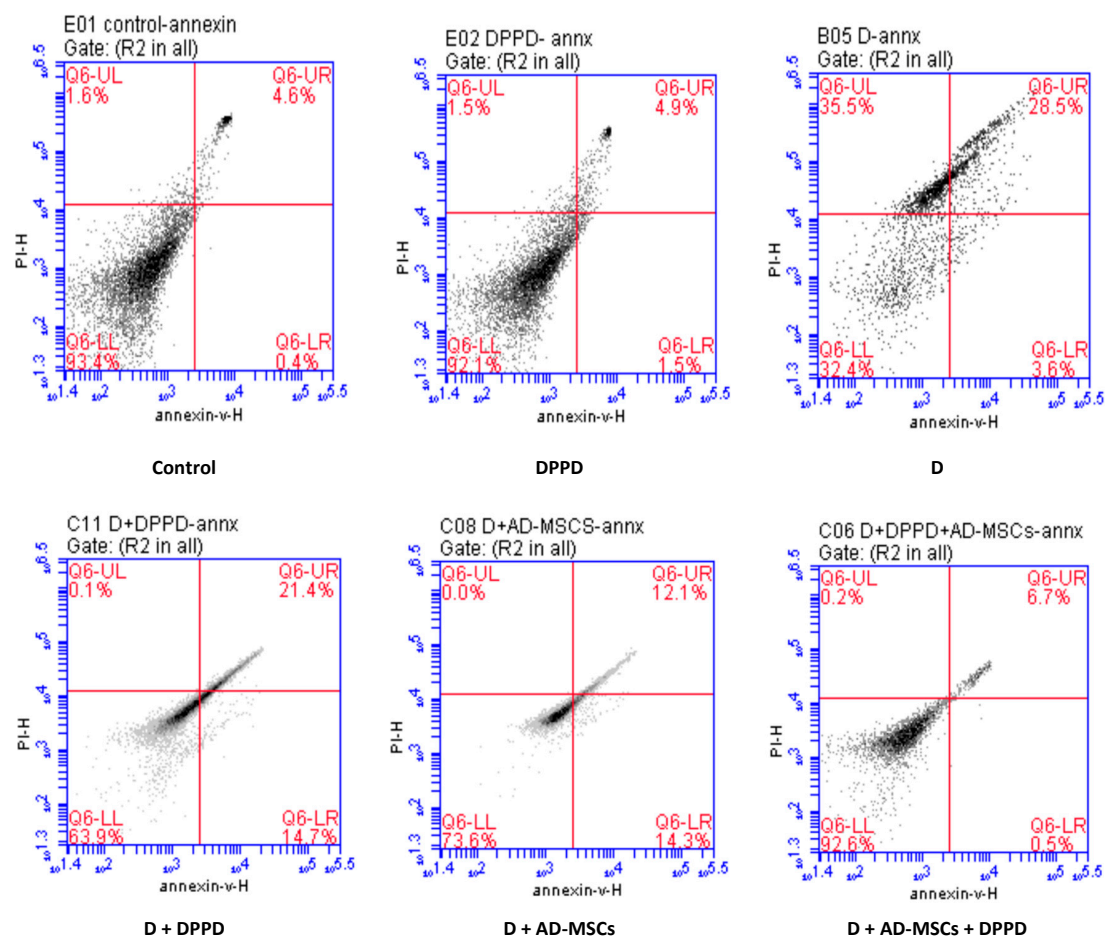


Figure S3a. Pancreatic annexin V %.

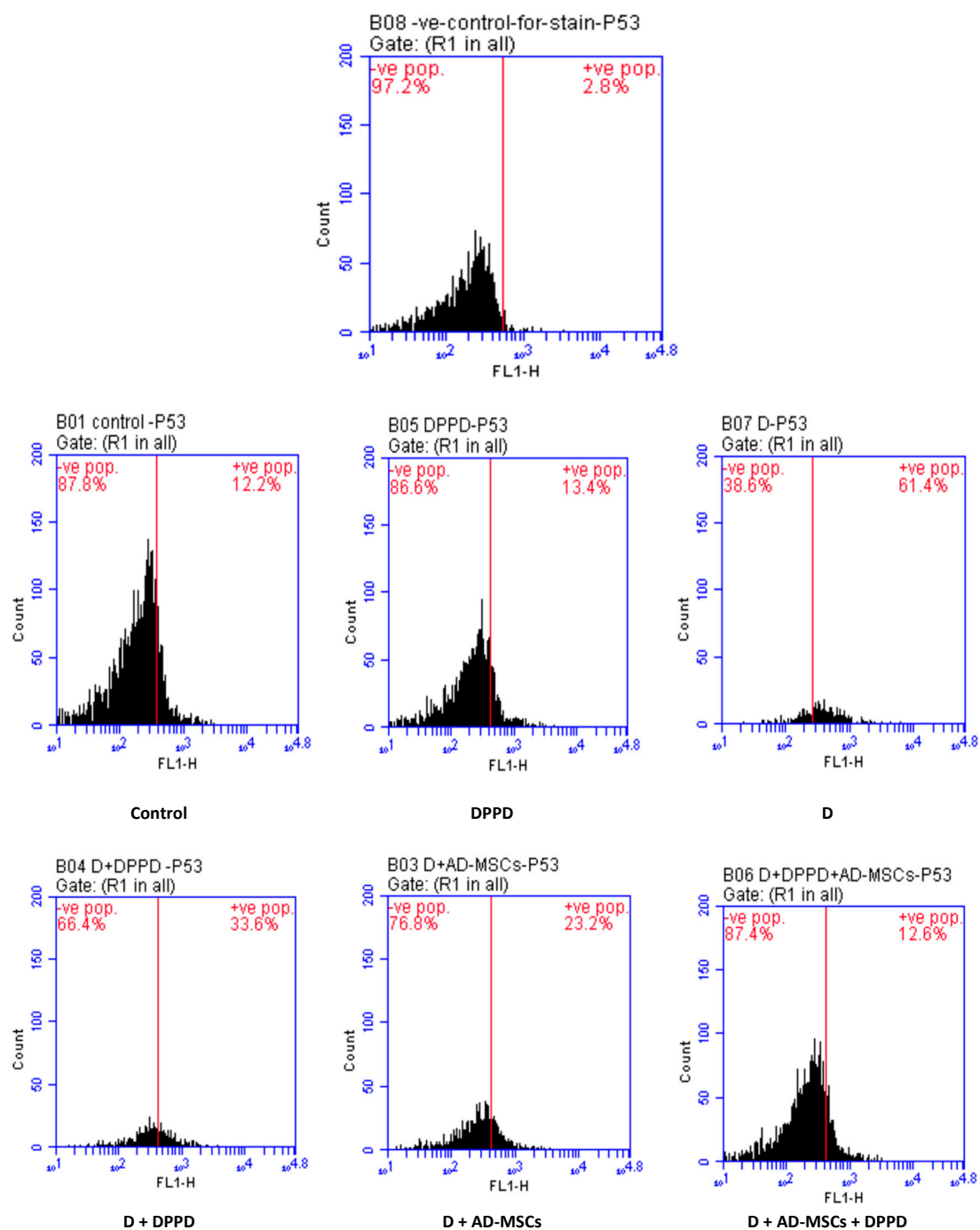


Figure S3b. Pancreatic P53 %

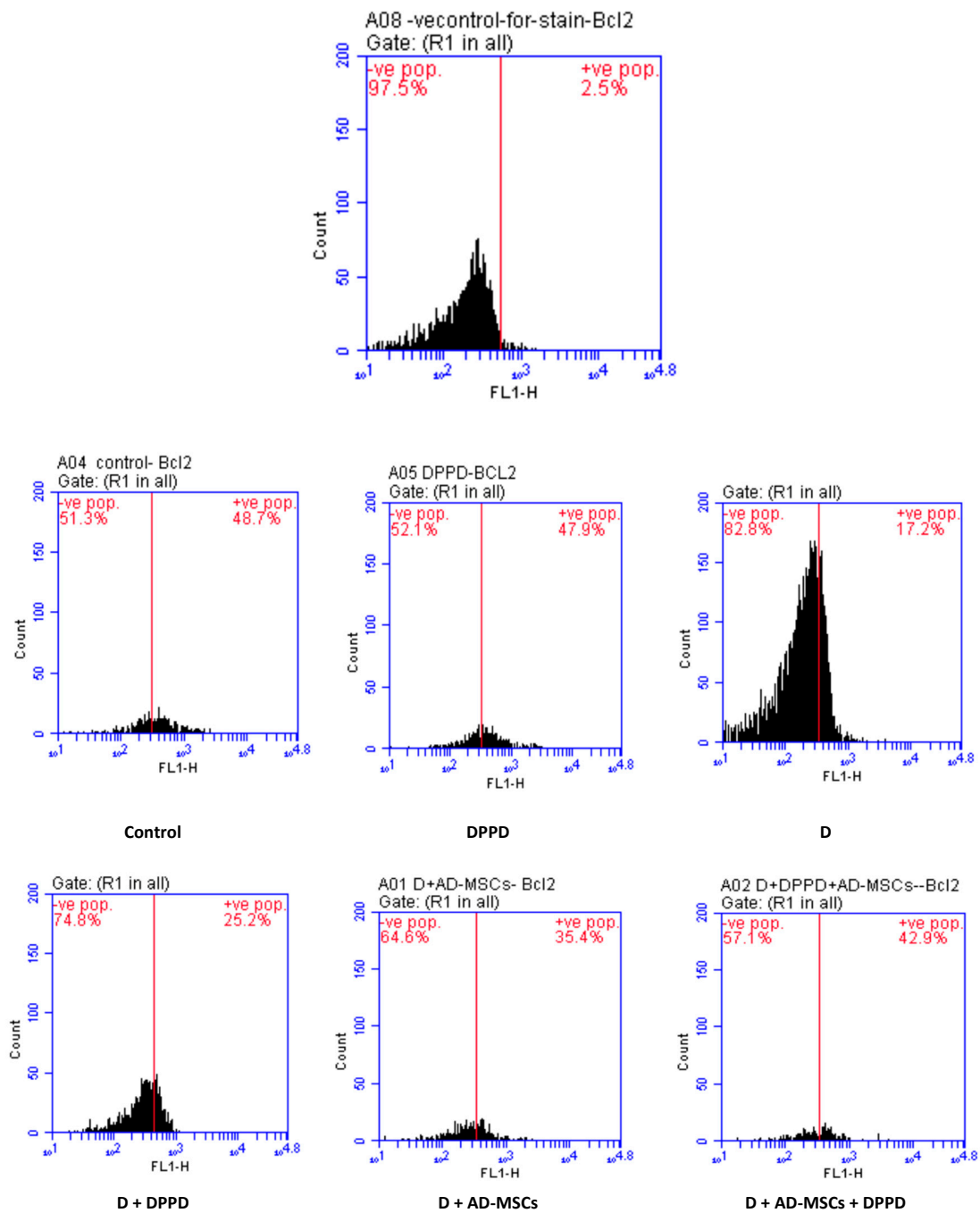


Figure S3c. Pancreatic Bcl-2 %.

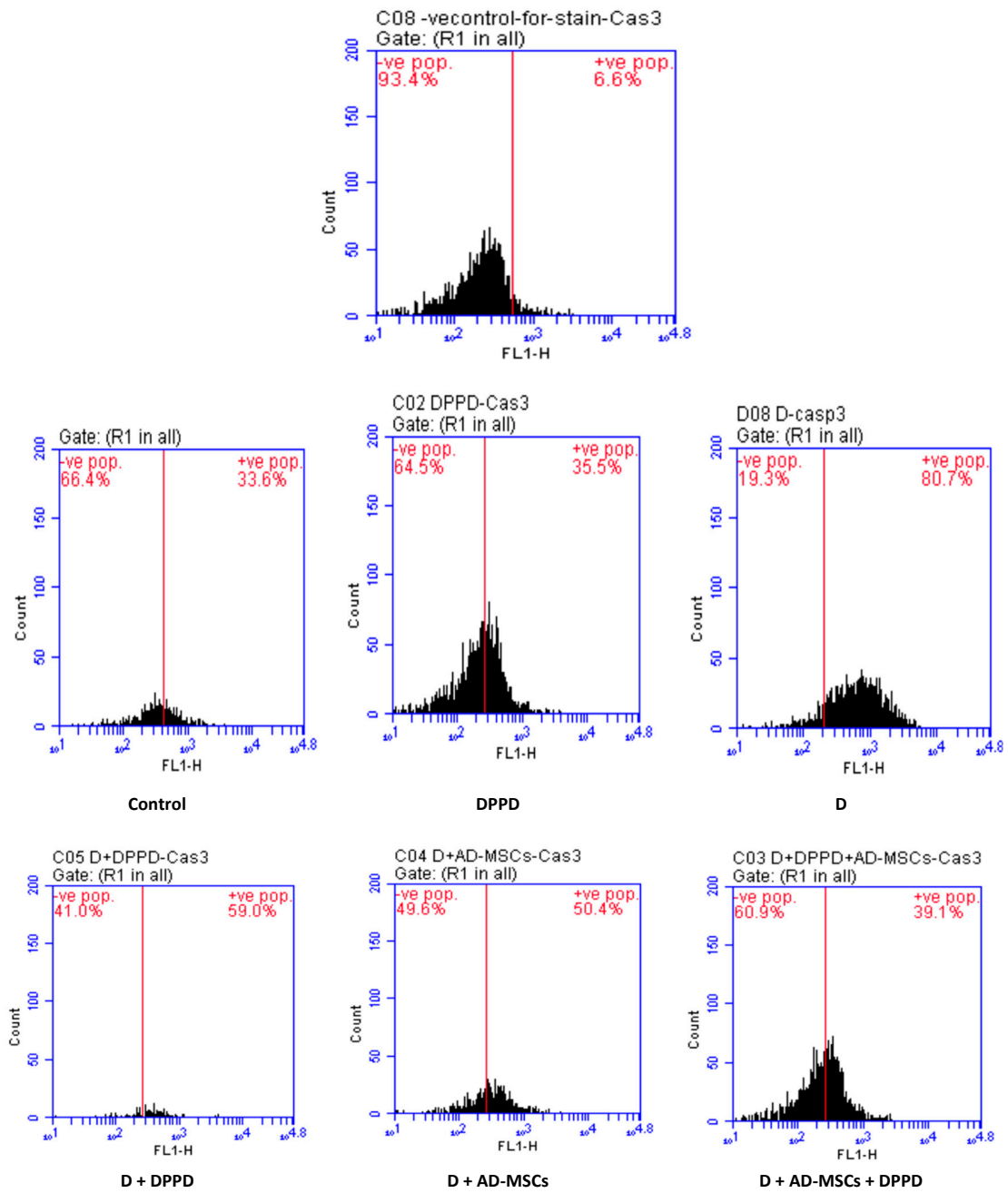


Figure S3d. Pancreatic caspase 3 %.

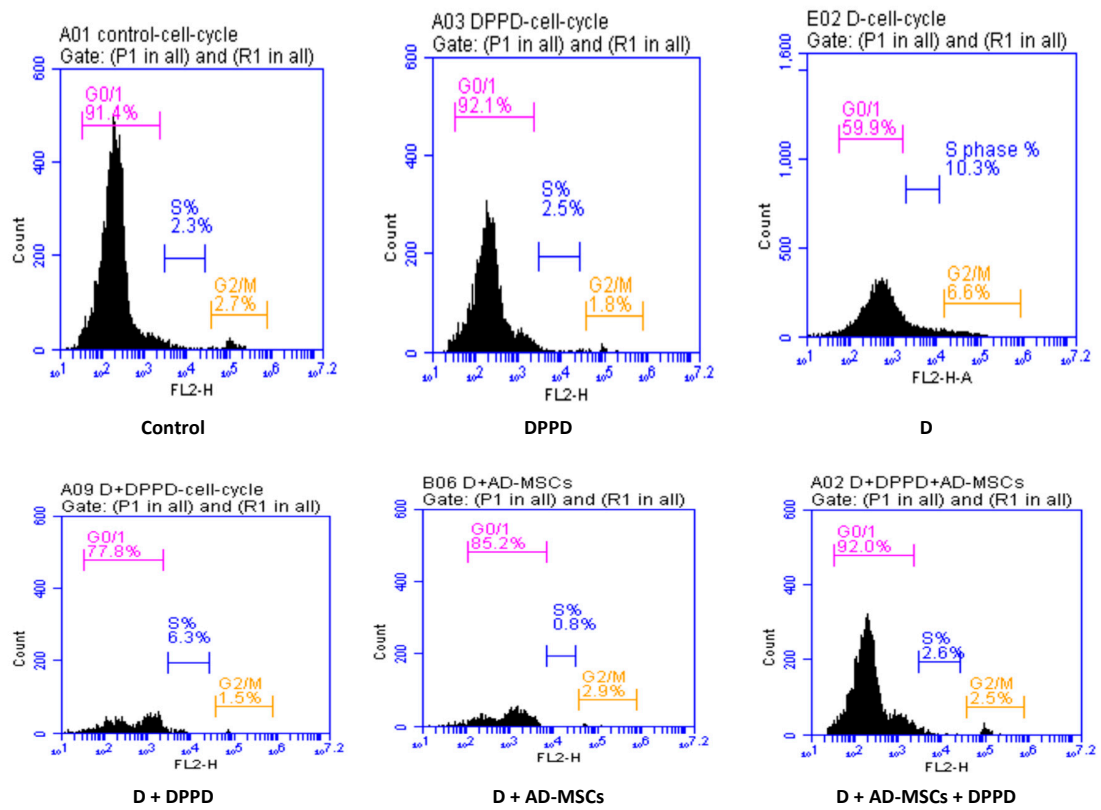


Figure S3e. Pancreatic viable cells (G0/G1) %.

Figure S3 (a-e). Pancreatic annexin V, P53, caspase 3, Bcl-2 & viable cells (G0/G1) %.

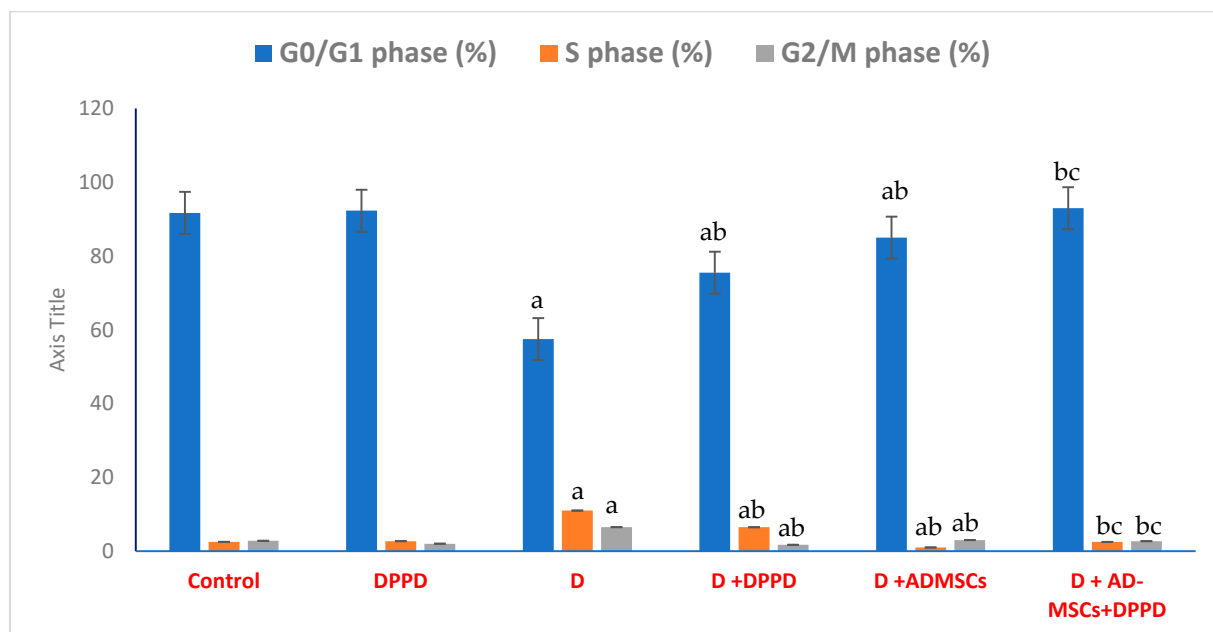


Figure S4. Pancreatic cell cycle %. Values expressed as \pm SEM (n = 6). ^{a,b} & ^c are Significant differences ($P \leq 0.05$) compared to control, diabetic untreated and DPPD-diabetic treated groups, respectively. % is the percent of change compared to the diabetic group.

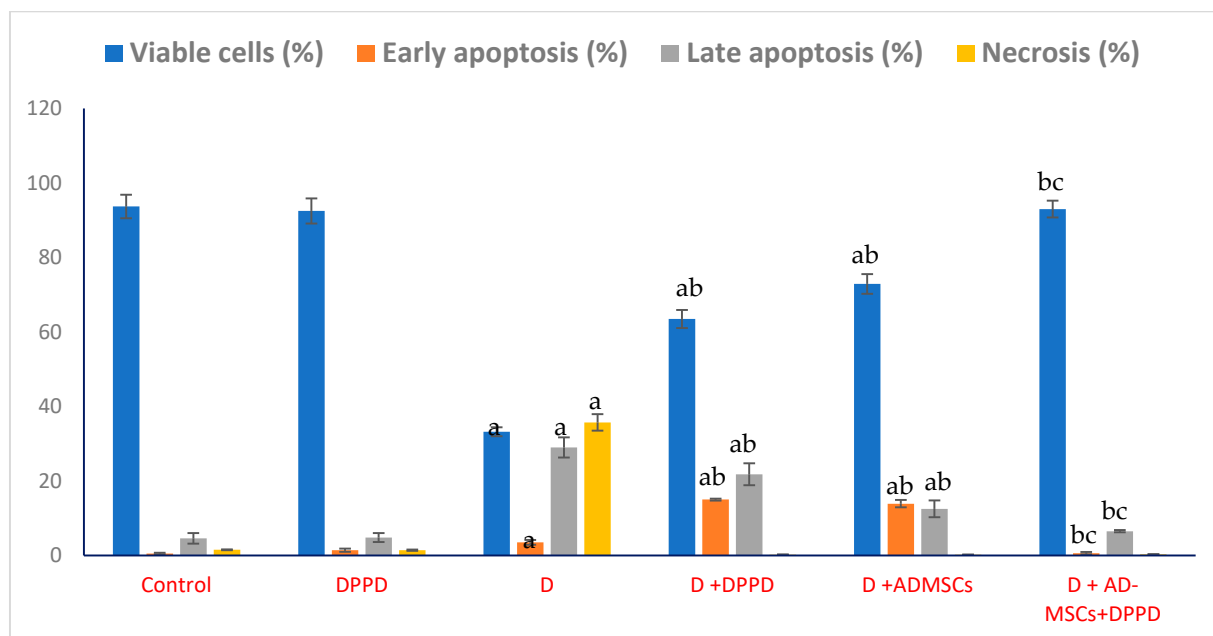


Figure S5. Pancreatic annexin V %. Values expressed as \pm SEM (n = 6). ^{a,b} & ^c are Significant differences ($P \leq 0.05$) compared to control, diabetic untreated and DPPD-diabetic treated groups, respectively. % is the percent of change compared to the diabetic group.