

Table S1. Summary of Flow Cytometry ROS Analysis Parameters in OVCAR3 Cells

Category	Parameter / Comparison	Value / Observation	Interpretation / Purpose
Raw Fluorescence Intensity (MFI)	Unstained Control	120	Autofluorescence baseline
	Control	250 (1.00-fold)	Basal ROS level
	Q	545 (2.18-fold)	Moderate ROS increase
	DOX	860 (3.45-fold)	Significant ROS induction
	DOX+Q	1705 (6.82-fold)	Strong synergistic ROS increase
	NAC + DOX+Q	380 (1.52-fold)	ROS suppression/rescue effect
ROS-Positive Cell Distribution	Unstained Control	0.5% ROS-positive / 99.5% ROS-negative	Background fluorescence
	Control	3% ROS-positive / 97% ROS-negative	Basal ROS distribution
	Q	18% ROS-positive / 82% ROS-negative	Moderate oxidative response
	DOX	35% ROS-positive / 65% ROS-negative	Increased oxidative stress
	DOX+Q	72% ROS-positive / 28% ROS-negative	Markedly elevated ROS accumulation
	NAC + DOX+Q	10% ROS-positive / 90% ROS-negative	NAC-mediated ROS attenuation
Flow Cytometry Controls	FMO-FITC	MFI \approx 140; 1–2% positive	Negative gate determination
	FITC Single-Stained	MFI \approx 900–1500; 95–99% positive	Compensation setup
	Unstained Cells	MFI \approx 120; <1% positive	Autofluorescence reference
Compensation Matrix	FITC Spillover	PE: 4%; PerCP: 0.5%; APC: 0%	Spectral compensation
	PE Spillover	PerCP: 1%	Spectral compensation
	PerCP Spillover	APC: 0.5%	Spectral compensation
Cytometer Acquisition Parameters	ROS Dye	DCFH-DA	ROS detection
	Excitation Laser	488 nm	FITC excitation
	Detection Channel	FITC (530/30 nm)	Fluorescence acquisition
	Events Acquired	10,000–20,000 cells	Statistical reliability
	FSC Threshold	50,000–70,000	Debris exclusion
	FITC PMT Voltage	420–500 V	Signal optimization
	Compensation Requirement	Minimal	Low spectral overlap
	Gating Strategy	FSC/SSC \rightarrow Singlets \rightarrow FITC-positive	Population selection
	ROS Positive Threshold	$\sim 10^3$ fluorescence units	Positive event definition
Statistical Annotation Mapping	ns	$p > 0.05$	Non-significant
	*	$p < 0.05$	Significant
	**	$p < 0.01$	Highly significant
	***	$p < 0.001$	Very highly significant

Category	Parameter / Comparison	Value / Observation	Interpretation / Purpose
<i>Biological Interpretation Summary</i>	Q vs Control	—	Quercetin moderately increased intracellular ROS
	DOX vs Control	—	Doxorubicin significantly induced oxidative stress
	DOX+Q vs DOX	—	Combination treatment markedly enhanced ROS production
	NAC + DOX+Q vs DOX+Q	—	NAC substantially attenuated ROS accumulation
	NAC + DOX+Q vs Control	—	ROS levels partially returned toward baseline