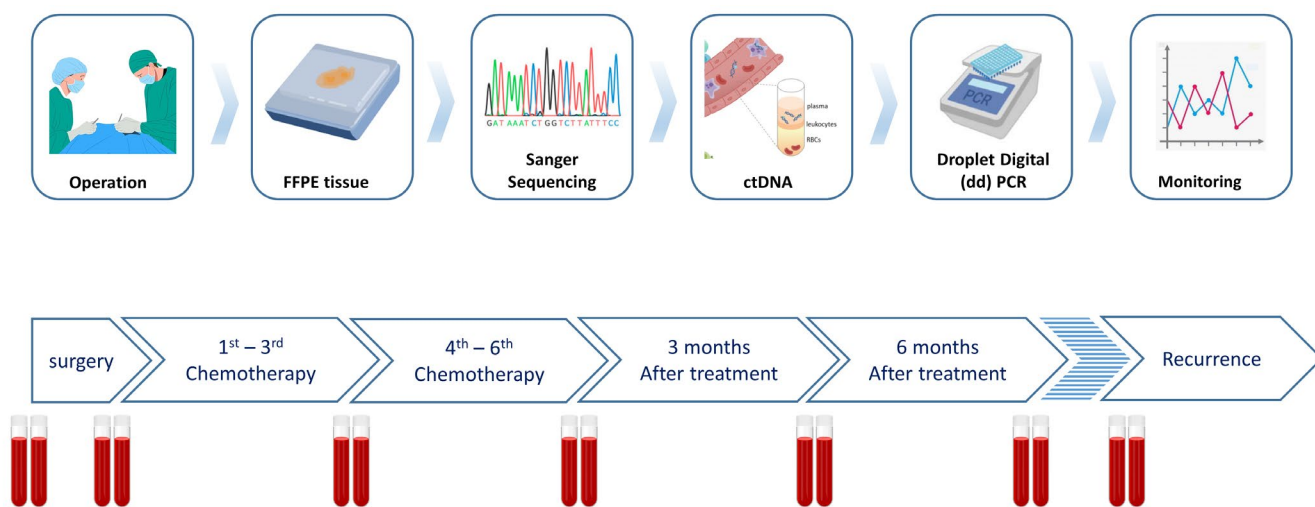
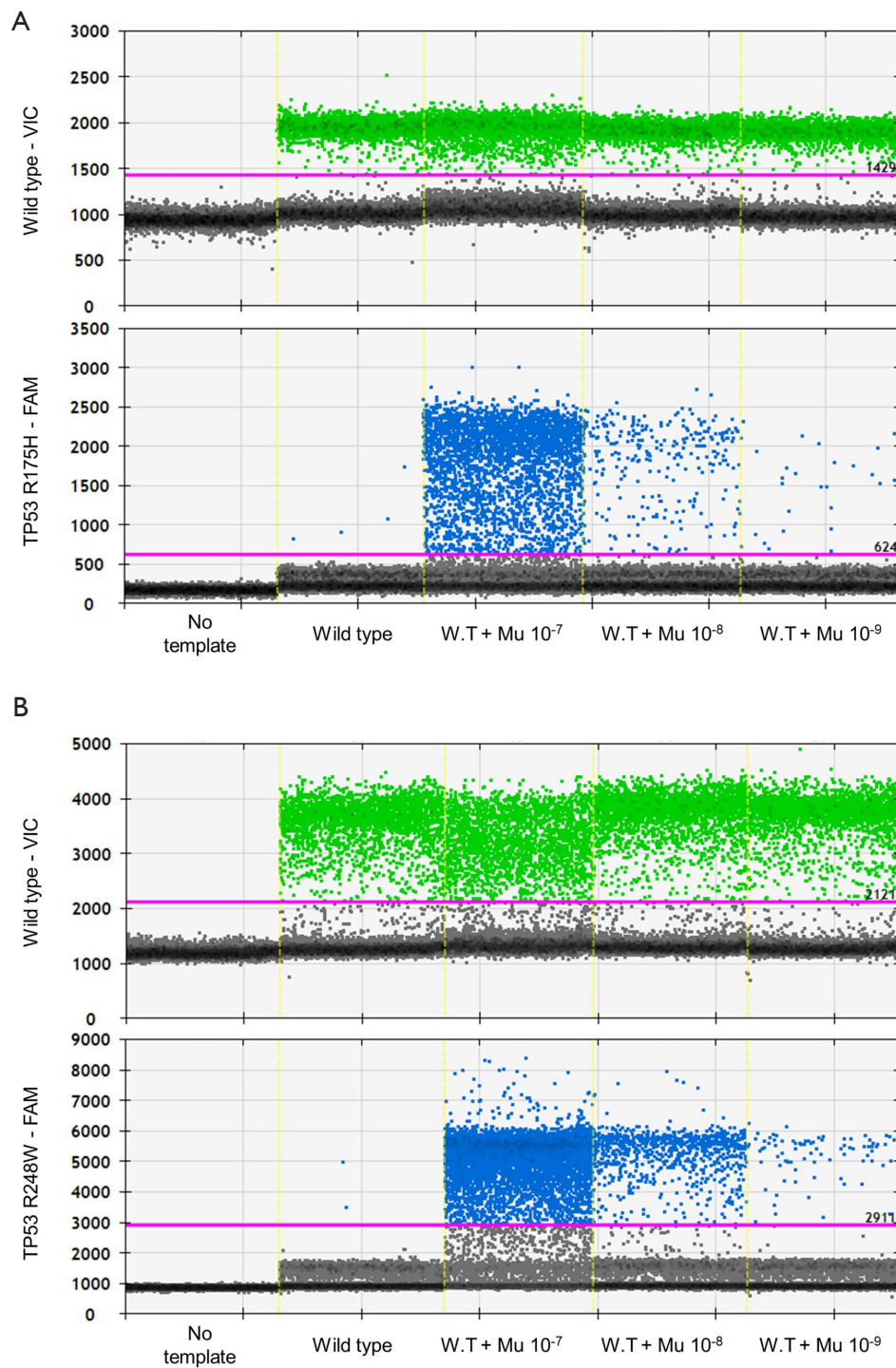


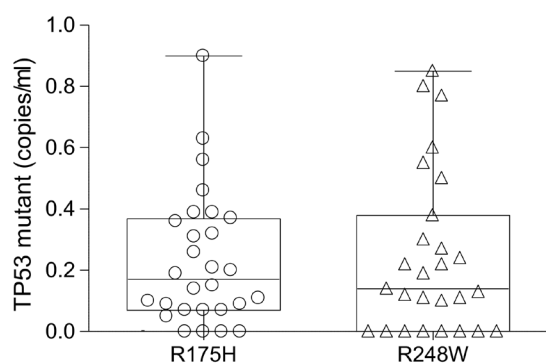
Supplementary



**Figure S1** Schematic workflow for ctDNA analysis. ctDNA, circulation tumor DNA; FFPE, formalin-fixed paraffin embedded.



**Figure S2** Analytical validation of droplet digital PCR assays for patient-specific TP53 mutations. (A) Validation of droplet digital PCR detection for the TP53 R175H mutation (template: 10 ng). (B) Validation of droplet digital PCR detection for the TP53 R248W mutation (template: 10 ng). Mu, mutation; WT, wildtype.



**Figure S3** Analysis of the limit of blank for the droplet digital PCR assay using blank sample.

**Table S1** Comparison of CA-125 and TP53 mutant allele count reduction rates before and after treatment

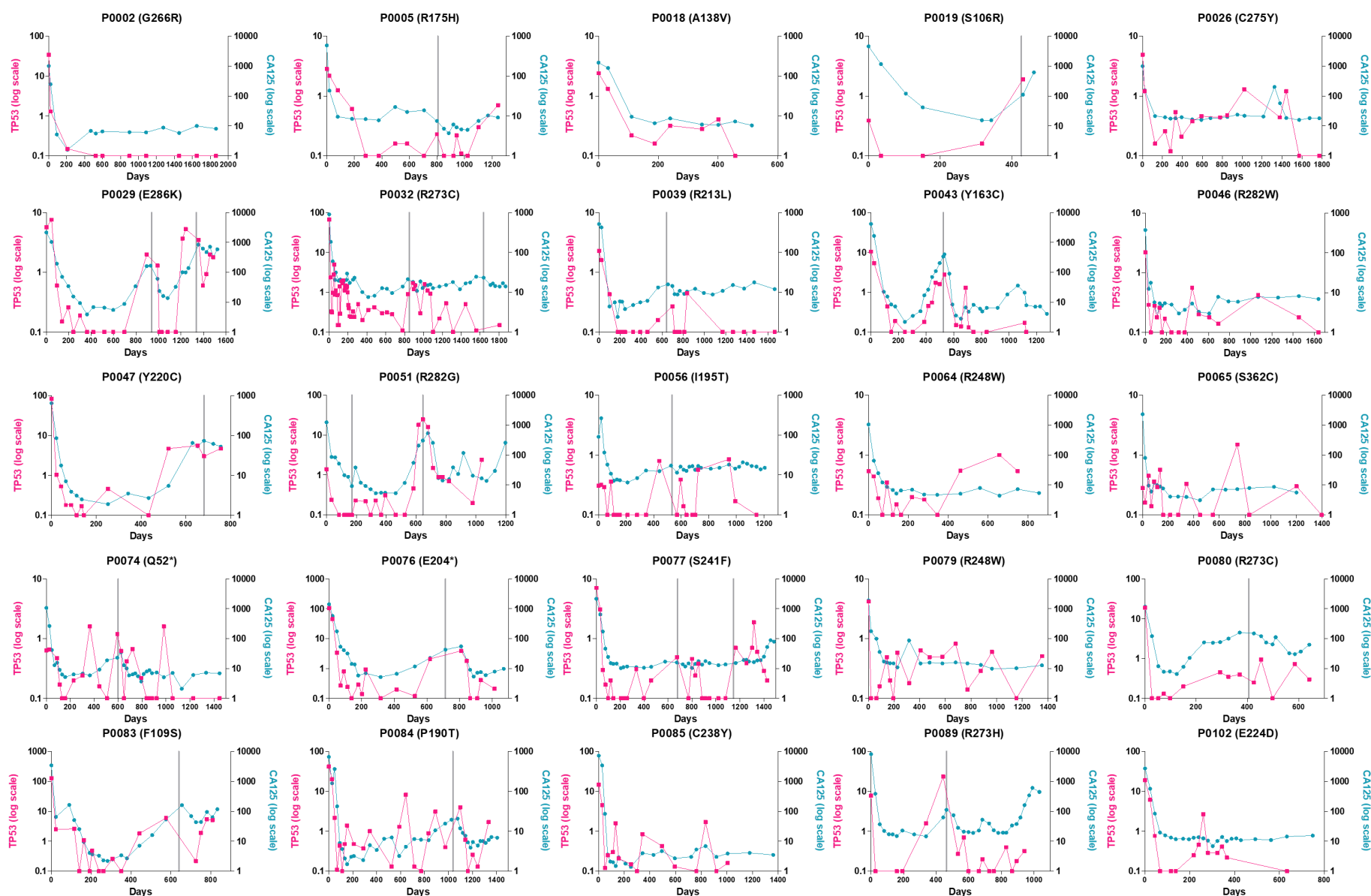
Time point	Marker	Average	P value*
Pre-treatment	CA-125	2,037.6	–
	TP53MAC	19.27	–
Post-OP	CA-125	461.5	<0.001
	TP53MAC	4.18	0.003
Post-CTx #3	CA-125	24.8	<0.001
	TP53MAC	0.39	0.003
Post-CTx #6	CA-125	10.93	<0.001
	TP53MAC	0.20	0.011

Post-CTx #3 and #6 indicate third and sixth cycles of chemotherapy, respectively. \*, P values indicate comparisons of marker levels at each time point versus pre-treatment levels, assessed using the Wilcoxon signed-rank test. CA-125, cancer antigen 125; CTx, chemotherapy; post-OP, postoperative; TP53MAC, TP53 mutant allele count.

**Table S2** Sensitivity comparison of TP53 mutant allele count and CA-125 at fixed specificity levels

Time point	Sensitivity (%)	
	TP53MAC	CA-125
Pre-OP	57.15	57.15
Post-OP	86.44	77.80
Post-CTx #3	35.00	57.15
Post-CTx #6	83.97	38.91
3 months f/u	58.79	37.05
6 months f/u	43.62	29.86

Post-CTx #3 and #6 indicate third and sixth cycles of chemotherapy, respectively. CA-125, cancer antigen 125; CTx, chemotherapy; post-OP, postoperative; TP53MAC, TP53 mutant allele count.



**Figure S4** Longitudinal comparison of TP53 mutant allele count and CA125 levels during treatment and follow-up in 25 patients with high-grade serous ovarian cancer. Individual patient profiles showing dynamic changes of TP53 mutation-based ctDNA (TP53 mutant allele count, pink line) and CA125 (blue line) levels throughout the treatment course. Each panel represents one patient with their specific TP53 mutation indicated in parentheses. The x-axis represents days from initial treatment, and y-axes show TP53 mutant allele count concentrations (left, copies/ $\mu$ L) and CA125 levels (right, U/mL).