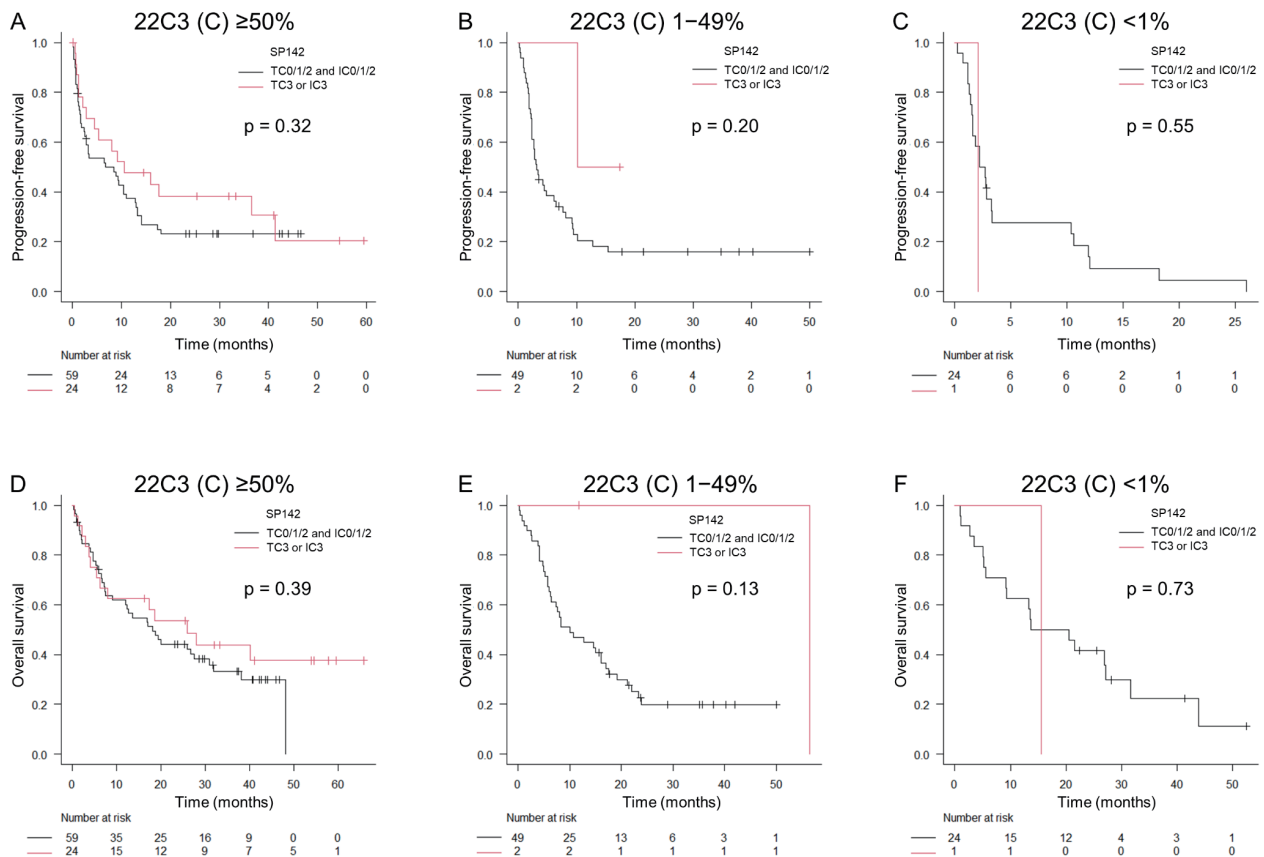
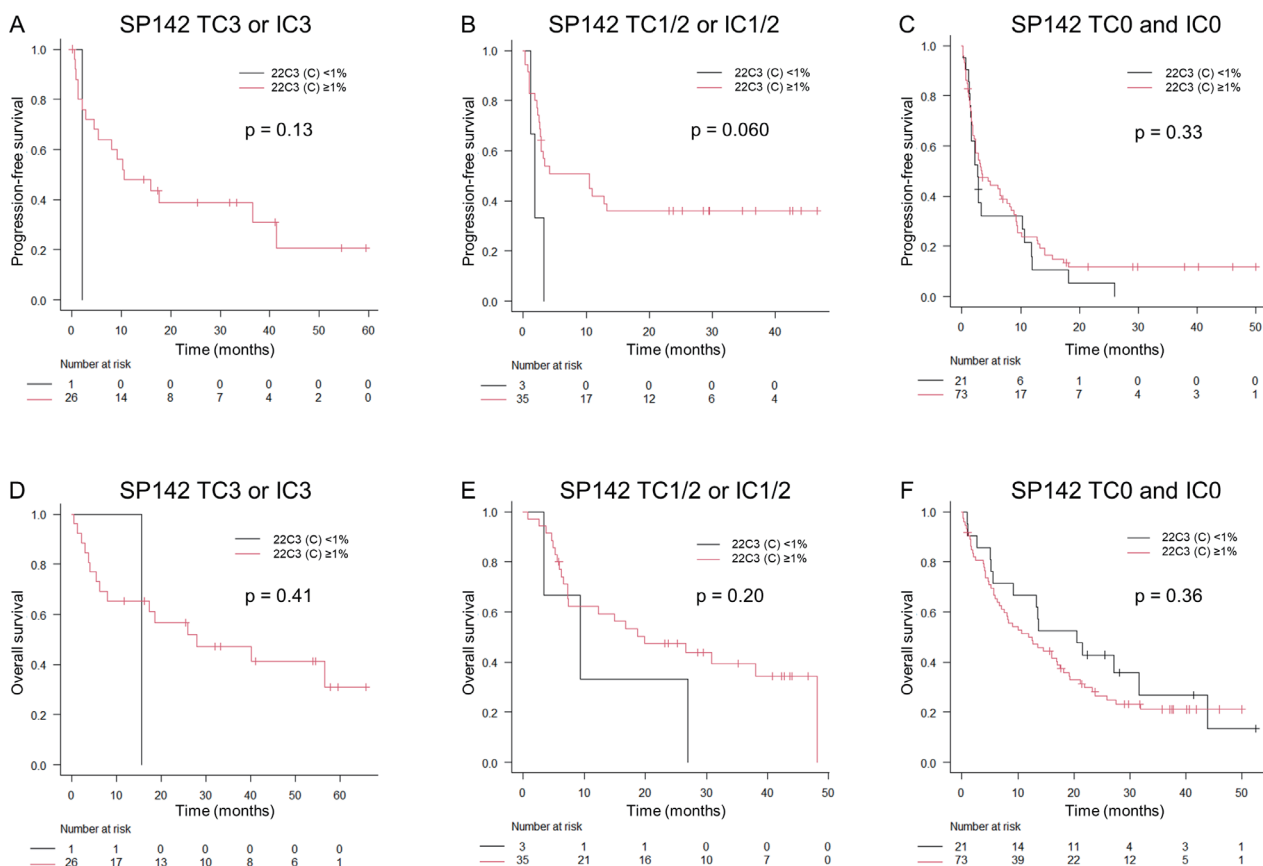


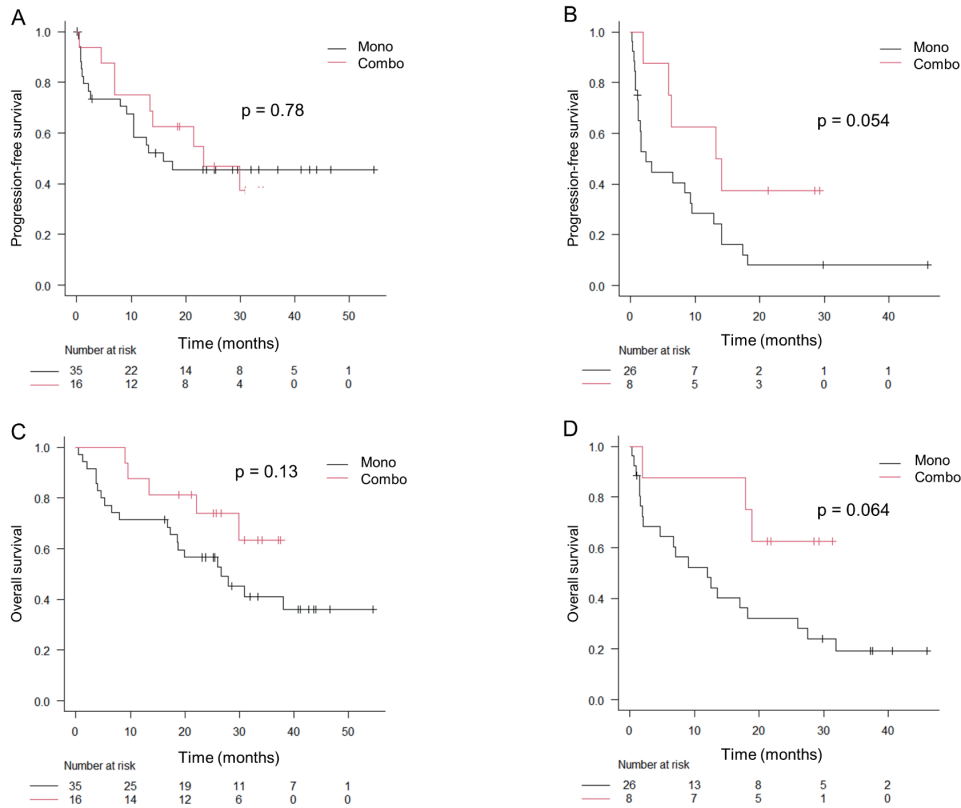
**Figure S1** Kaplan-Meier curves of PFS and OS in patients evaluated for PD-L1 expression levels using each PD-L1 assay. The Kaplan-Meier curves of PFS in patients treated with ICI monotherapy with 22C3 (C)  $\geq 50\%$ , 1–49% and  $<1\%$  (A) and with SP142 TC3 or IC3, TC1/2 or IC1/2 and TC0 and IC0 (B). Kaplan-Meier curves of OS in patients treated with ICI monotherapy with 22C3 (C)  $\geq 50\%$ , 1–49% and  $<1\%$  (C) and with SP142 TC3 or IC3, TC1/2 or IC1/2 and TC0 and IC0 (D). 22C3 (C): PD-L1 TPS reviewed from medical records and evaluated by performing 22C3 staining in clinical practice; TC3 or IC3: PD-L1 expression on at least 50% of tumor cells or 10% of tumor-infiltrating immune cells; TC1/2 or IC1/2: PD-L1 expression on at least 1% of tumor cells or tumor-infiltrating immune cells and less than 50% of tumor cells or less than 10% of tumor-infiltrating immune cells; TC0 and IC0: PD-L1 expression on less than 1% of tumor cells and tumor-infiltrating immune cells.



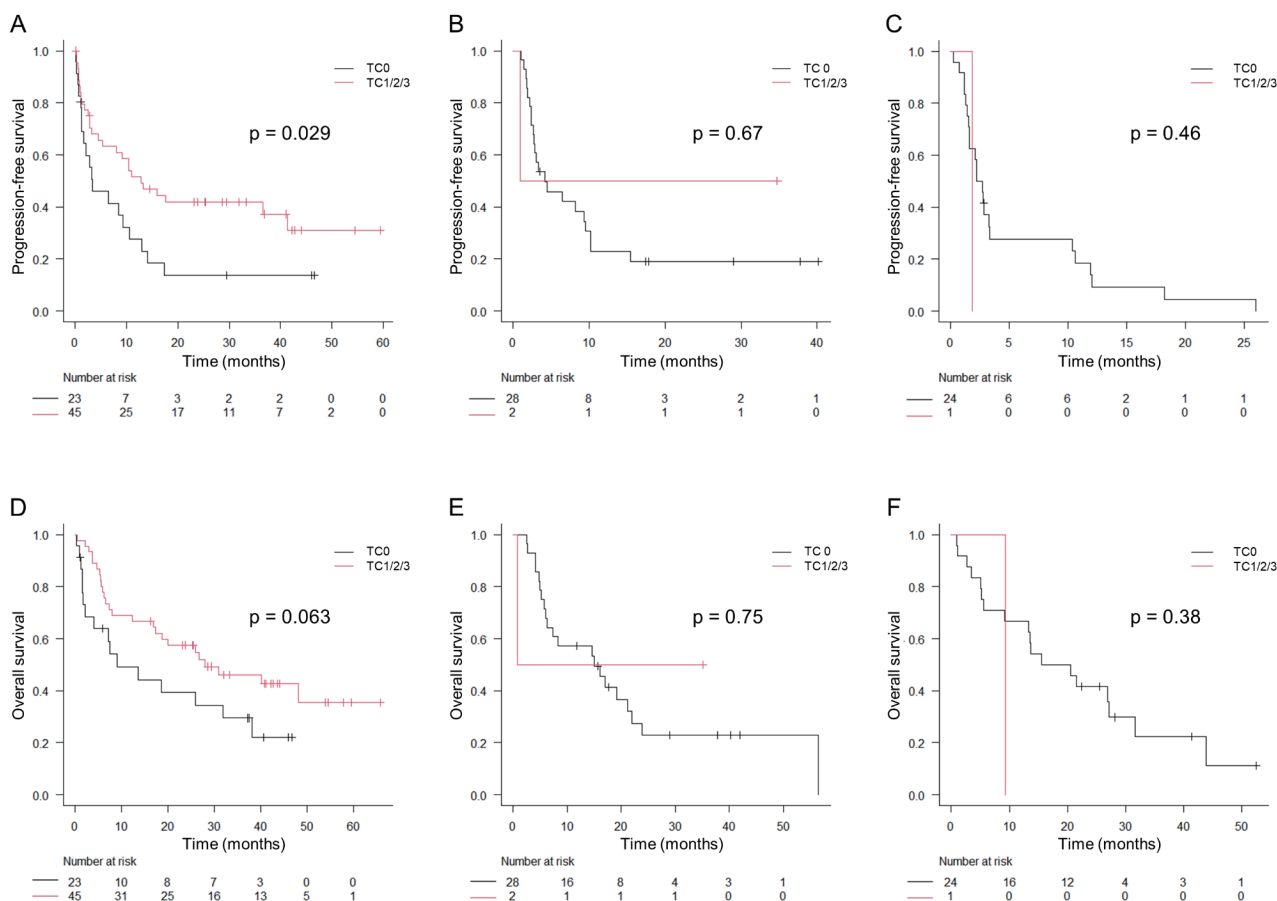
**Figure S2** PFS and OS analyses compared based on the SP142 results at each 22C3 (C) level. The comparison of Kaplan-Meier curves for PFS between patients with SP142 TC0/1/2 and IC0/1/2 and patients with SP142 TC3 or IC3 among patients with 22C3 (C)  $\geq 50\%$  (A), 22C3 (C) 1–49% (B), 22C3 (C)  $< 1\%$  (C). The comparison of Kaplan-Meier curves for OS between patients with SP142 TC0/1/2 and IC0/1/2 and patients with SP142 TC3 or IC3 among patients with 22C3 (C)  $\geq 50\%$  (D), 22C3 (C) 1–49% (E), 22C3 (C)  $< 1\%$  (F). TC0/1/2 and IC0/1/2: PD-L1 expression on less than 50% of tumor cells and less than 10% of tumor-infiltrating immune cells; TC3 or IC3: PD-L1 expression on at least 50% of tumor cells or 10% of tumor-infiltrating immune cells; 22C3 (C): PD-L1 TPS reviewed from medical records and evaluated by performing 22C3 staining in clinical practice.



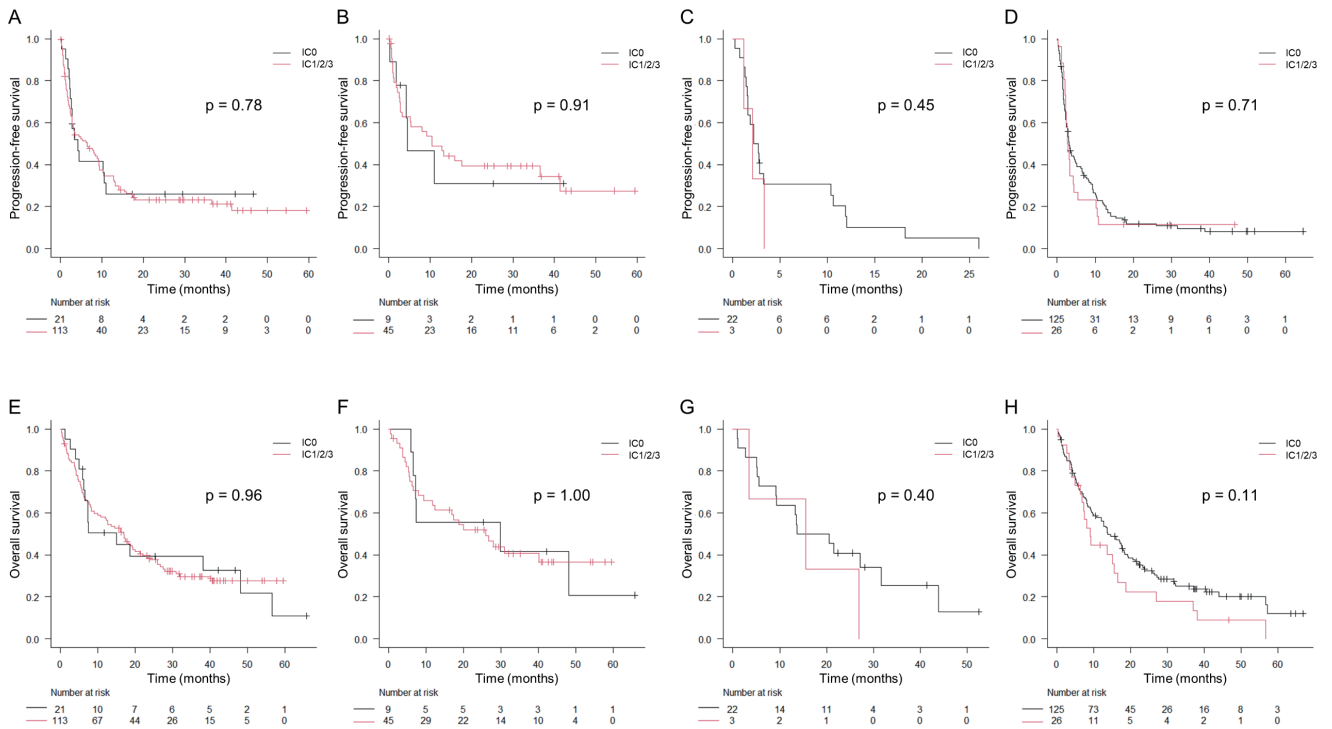
**Figure S3** Progression-free survival (PFS) and overall survival (OS) analyses compared based on 22C3 results in groups divided by SP142 results. The comparison of Kaplan-Meier curves for PFS between patients with 22C3 (C) <1% and 22C3 (C) ≥1% among patients with SP142 TC3 or IC3 (A), TC1/2 or IC1/2 (B), TC0 and IC0 (C). The comparison of Kaplan-Meier curves for OS between patients with 22C3 (C) <1% and 22C3 (C) ≥1% among patients with SP142 TC3 or IC3 (D), TC1/2 or IC1/2 (E), TC0 and IC0 (F). 22C3 (C): programmed death-ligand 1 (PD-L1) tumor proportion score reviewed from medical records evaluated by 22C3 in clinical practice, TC3 or IC3: PD-L1 expression on at least 50% of tumor cells or 10% of tumor-infiltrating immune cells; TC1/2 or IC1/2: PD-L1 expression on at least 1% of tumor cells or tumor-infiltrating immune cells and less than 50% of tumor cells or less than 10% of tumor-infiltrating immune cells; TC0 and IC0: PD-L1 expression on less than 1% of tumor cells and tumor-infiltrating immune cells.



**Figure S4** Progression-free survival (PFS) and overall survival (OS) analyses based on SP142 results between immune checkpoint inhibitor monotherapy and combination with chemotherapy in first-line treatment among patients with 22C3 (C)  $\geq 50\%$ . Comparison of Kaplan-Meier curves for PFS (A) and OS (C) between ICI monotherapy and combination with chemotherapy as a first-line treatment among patients with 22C3 (C)  $\geq 50\%$  and SP142 TC1/2/3 or IC1/2/3, and for PFS (B) and OS (D) between ICI monotherapy and combination with chemotherapy as a first-line treatment among patients with 22C3 (C)  $\geq 50\%$  and SP142 TC0 and IC0. 22C3 (C): programmed death-ligand 1 (PD-L1) tumor proportion score reviewed from medical records evaluated by 22C3 in clinical practice, TC1/2/3 or IC1/2/3: PD-L1 expression on at least 1% of tumor cells or tumor-infiltrating immune cells, TC0 and IC0: PD-L1 expression on less than 1% of tumor cells and tumor-infiltrating immune cells, Mono: immune checkpoint inhibitor monotherapy, Combo: combination of immune checkpoint inhibitors and cytotoxic chemotherapy.



**Figure S5** PFS and OS analyses compared based on SP142 TC results at each PD-L1 TPS level obtained with the 22C3 assay. Comparison of Kaplan-Meier curves for PFS between patients treated with ICI monotherapy presenting with SP142 TC0 and TC1/2/3 among patients with 22C3 (C)  $\geq 50\%$  (A), 1-49% (B),  $< 1\%$  (C). Comparison of Kaplan-Meier curves for OS between patients treated with ICI monotherapy presenting with SP142 TC0 and TC1/2/3 among patients with 22C3 (C)  $\geq 50\%$  (D), 1-49% (E),  $< 1\%$  (F). PD-L1: programmed death-ligand 1; TPS: tumor proportion score; TC0: PD-L1 expression on less than 1% of tumor cells; TC1/2/3: PD-L1 expression on at least 1% of tumor cells; 22C3 (C): PD-L1 TPS reviewed from medical records evaluated by performing the 22C3 assay in clinical practice.



**Figure S6** PFS and OS analyses of patients with PD-L1 expression in immune cells. Comparison of Kaplan-Meier curves for PFS (A) and OS (E) between patients treated with ICI monotherapy presenting with SP142 IC0 and SP142 IC1/2/3 among patients with 22C3 (C)  $\geq 1\%$ . Comparison of Kaplan-Meier curves for PFS (B) and OS (F) between patients treated with ICI monotherapy presenting with SP142 IC0 and SP142 IC1/2/3 among patients with SP142 TC1/2/3. Comparison of Kaplan-Meier curves for PFS (C) and OS (G) between patients treated with ICI monotherapy presenting with SP142 IC0 and SP142 IC1/2/3 among patients with 22C3 (C)  $< 1\%$ . Comparison of Kaplan-Meier curves for PFS (D) and OS (H) between patients treated with ICI monotherapy presenting with SP142 IC0 and SP142 IC1/2/3 among patients with SP142 TC0. 22C3 (C): PD-L1 TPS reviewed from medical records and evaluated by performing the 22C3 assay in clinical practice; IC0: PD-L1 expression on less than 1% of immune cells; IC1/2/3: PD-L1 expression on at least 1% of immune cells; TC1/2/3: PD-L1 expression on at least 1% of tumor cells.

**Table S1** The positive rate of PD-L1 expression in the tissue microarray between resection and biopsy samples based on 22C3 and SP142 assays

	Resection (N=83)	Biopsy (N=205)
22C3 (TMA) $\geq$ 50%	17 (20)	33 (16)
22C3 (TMA) 1–49%	23 (28)	52 (25)
22C3 (TMA) <1%	43 (52)	120 (59)
SP142 TC3 or IC3	13 (16)	30 (15)
SP142 TC1/2 or IC1/2	22 (27)	45 (22)
SP142 TC0 and IC0	48 (58)	130 (63)

Data presented as No (%). 22C3 (TMA): PD-L1 TPS for the tissue microarray stained with the 22C3 antibody; TC3 or IC3: PD-L1 expression on at least 50% of tumor cells or 10% of tumor-infiltrating immune cells; TC1/2 or IC1/2: PD-L1 expression on at least 1% of tumor cells or tumor-infiltrating immune cells and less than 50% of tumor cells or less than 10% of tumor-infiltrating immune cells; TC0 and IC0: PD-L1 expression on less than 1% of tumor cells and tumor-infiltrating immune cells.

**Table S2** Details of the ICI treatment lines in each group, divided by 22C3 and SP142 results

	1st line	2nd or later line
22C3 (C) $\geq$ 50%		
SP142 TC3 or IC3	16 (67)	8(33)
SP142 TC1/2/3 and IC1/2/3	35(67)	17 (33)
SP142 TC0/1/2 and IC0/1/2	45 (76)	14 (24)
SP142 TC0 and IC0	26(84)	5 (16)
22C3 (C) 1–49%		
SP142 TC3 or IC3	0 (0)	2 (100)
SP142 TC1/2/3 and IC1/2/3	2 (22)	7 (78)
SP142 TC0/1/2 and IC0/1/2	18 (37)	31 (63)
SP142 TC0 and IC0	16 (38)	26 (62)
22C3 (C) <1%		
SP142 TC3 or IC3	0 (0)	1 (100)
SP142 TC1/2/3 and IC1/2/3	0 (0)	4 (100)
SP142 TC0/1/2 and IC0/1/2	1 (4)	23 (96)
SP142 TC0 and IC0	1 (5)	20 (95)

Data presented as No (%). 22C3 (C): PD-L1 TPS reviewed from medical records and evaluated using 22C3 staining in clinical practice; TC3 or IC3: PD-L1 expression on at least 50% of tumor cells or 10% of tumor-infiltrating immune cells; TC1/2/3 or IC1/2/3: PD-L1 expression on at least 1% of tumor cells or tumor-infiltrating immune cells; TC0/1/2 and IC0/1/2: PD-L1 expression on less than 50% of tumor cells and less than 10% of tumor-infiltrating immune cells; TC0 and IC0: PD-L1 expression on less than 1% of tumor cells and tumor-infiltrating immune cells.