**Supplementary Table 1: Summary of major neoadjuvant clinical trials for each disease category**

| Disease category | Tumor Type | Treatment | Phase | Number of patients enrolled/to enroll Status | Design | Endpoints/Results | Biomarkers analysis/Results | NCT Reference |
|---|---|---|---|---|---|---|---|---|
| **Melanoma** | Regional Stage IIIB/C Melanoma | HDI | 2 | 20 | Single group Open label | **Clinical reponse** = 55%<br>**pCR** = 15%.<br>**Median follow-up of 18.5 months** (range, 7 months to 50 months): 10 patients had no evidence of recurrent disease. | Up-regulation of pSTAT1 following INFα with down-regulation of pSTAT3 and total STAT3 levels in tumor cells and lymphocytes.<br>High pSTAT1/pSTAT3 as tested in pretreated tumor cells associated with longer OS (P = 0.032).<br>Significantly increased endotumoral infiltrates of CD11c+ and CD3+ cells following INFα in responders as compared to non-responders. | Moschos SJ et al., 2006 [1]<br>Wang W et al., 2007 [2] |
| | Stage IIIB-C Melanoma | Ipilimumab (10 mg/kg) | 1 | 33 Completed | Single group Open label | **RFS** at median follow up 18 months = 11 months<br>**pCR** = None but ~ 10% of patients had a major pathologic response | Significant immunomodulating role for ipilimumab on regulatory T cells, myeloid derived suppressor cells (MDSC), and effector T cells in the circulation and tumor microenvironment.<br>Greater decrease in MDSC (Lin1-/HLA-DR-/CD33+/CD11b+) associated with improved RFS (p = 0.03).<br>Lower baseline levels of circulating regulatory T cells (Tregs, CD4+CD25hi+CD39+) associated with improved RFS (p = 0.04).<br>following ipilimumab, significant TME infiltration by CD8+ T cells fully activated (CD69+) CD3+/CD4+ and CD3+/CD8+ T-cells | NCT00972933<br>Tarhini AA et al., 2014 & 2017 [3, 4]<br>Retseck J et al., 2018 [5] |
| | Locally/Regionally Advanced/Recurrent Melanoma | Ipilimumab (3 mg/kg or 10 mg/kg) + HDI | 1 | 30 Completed | Randomized Parallel Assignment Open label | **AEs**: More Grade 3/4 irAEs with ipilimumab 10 mg/kg versus 3 mg/kg (p = 0.042).<br>**28 evaluable patients**: 11 relapsed (5 died).<br>**Radiologic preoperative response rate** = 36%.<br>**pCR** = 32%. | **Patients with pCR**:<br>T-cell fraction significantly higher when measured in primary melanoma tumors (p = 0.033).<br>Higher tumor T-cell clonality in primary tumor and more so following neoadjuvant therapy was significantly associated with improved relapse free survival. | NCT01608594<br>Tarhini AA et al., 2018 [6] |

| Disease category | Tumor Type | Treatment | Phase | Number of patients enrolled/to enroll Status | Design | Endpoints/Results | Biomarkers analysis/Results | NCT Reference |
|---|---|---|---|---|---|---|---|---|
| | Resectable Advanced (stage III/IV) Melanoma | Pembrolizumab (200 mg) | 1b | 33 Completed | Single group Open label | **Pathologic response:** 8 of 27 patients (29.6%, 95% CI 13.8–50.2%) had a complete (no residual tumor identified; n=5) or major (10% or less viable tumor cells; n=3) pathologic response. | Transcriptional analysis demonstrated a pre-treatment immune signature (Neoadjuvant Response Signature) associated with clinical benefit.<br>pCR patients: Accumulation of exhausted CD8 T-cells in the tumor<br>Patients with recurrent disease exhibited mechanistic evidence of immune resistance. | NCT02434354<br>Huang AC et al., 2019 [7] |
| | Locally/Regionally Advanced/Recurrent Melanoma | Pembrolizumab + HDI | 1 | 31 Completed | Single group Open label | **Radiographic ORR** = 73.3%<br>**pCR** = 43%.<br>**OS and RFS** not reached at data cutoff (29.7 months). | Intratumoral PD1/PDL1 interaction and HLA-DR expression associated with pCR | NCT02339324<br>Najjar YG et al., 2021 [8] |
| | Resectable Stage IIIB, IIIC, or M1a Melanoma | **Arm 1**: T-VEC for 6 doses followed by surgical resection of melanoma tumor lesion(s).<br>**Arm 2**: Immediate surgical resection of melanoma tumor lesion(s) following surgery + possible adjuvant systemic therapy and/or radiotherapy SOC | 2 | 150 Active, Not recruiting | Randomized Parallel Assignment Open label | **pCR rate**: Arm 1 = 15.8%<br>**R0 rates**: Arm1 = 42.1%, Arm 2 = 37.8%.<br>**OR (CR+PR)**: Arm 1 = 14.7% (80% CI: 9-22%).<br>**AEs**: Arm 1 = 93% (1 grade 4 pain, no grade 5), Arm 2 = 45% (all ≤ grade 3).<br>**SAEs**: Amr 1 = 17.8%, Arm 2 = 2.9%.<br>**RFS ongoing** | NA | NCT02211131<br>Andtbacka RHI et al., 2018 [9] |
| | Clinical Stage | **Arm 1**: | 2 | 23 | Randomized | **ORR**: Arm 1 = 25%, Arm 2 = 73% | Higher lymphoid infiltrates in | NCT02519322 |

| Disease category | Tumor Type | Treatment | Phase | Number of patients enrolled/to enroll Status | Design | Endpoints/Results | Biomarkers analysis/Results | NCT Reference |
|---|---|---|---|---|---|---|---|---|
| | III or Oligometastatic Stage IV Melanoma | Nivolumab (3 mg/kg) **Arm 2**: Nivolumab (1 mg/kg) + Ipilimumab (3 mg/kg) | | Active, Not recruiting | Parallel Assignment Open label | **pCR**: Arm 1 = 25%, Arm 2 = 45%<br>**AEs grade 3**: Arm 1 = 8% , Arm 2 = 73% | responders to both therapies<br>More clonal and diverse T cell infiltrate in responders to nivolumab monotherapy | Amaria RN et al., 2018 [10] |
| | Palpable Stage III melanoma | **Arm 1**: Ipilimumab (3 mg/kg) + Nivolumab (1 mg/kg) - post surgery for 12 weeks **Arm 2**: Ipilimumab (3 mg/kg) + Nivolumab (1 mg/kg) - pre surgery for 6 weeks and post surgery for 6 weeks | 1b | 20 Active, Not recruiting | Randomized Parallel Assignment Open label | **AEs Grade 3/4**: both arms = 9/10 patients experienced one or more. Only 1/10 patients within each arm received all four courses of ipilimumab + nivolumab.<br>**Pathological responses**: Arm 2 = 7/9 (78%) patients (pCRs = 3, near pCR = 3, and 1 patient achieving a pPR = 1). None of these patients had relapsed after 4 years.<br>**RFS**: Arm 1 = 4 patients with distant metastases. Arm 2 = 1 patient with local recurrence and 1 patient with distant metastasis.<br>**4-year OS rates:** Arm 2 = 90%, Arm 1 = 70%<br>**4-year EFS rate**: Arm 2 = 80%, Arm 1 = 60% | PD-L1 expression ≥ 1%: Arm 1 = 40% of patients, Arm 2 = 60% of patients.<br>Reduced T cell tumor infiltrate and a lower productive T cell clonality within the tumor regularly found in patients who relapsed after ipilimumab + nivolumab.<br>Baseline tumor biopsies: low CD3, β2 microglobulin (B2M) and PD-L1 molecule expression within the tumor areas strongly associated with relapse after neoadjuvant or adjuvant ipilimumab + nivolumab.<br>Low RNA expression of the IFN-γ signature18 was associated with relapse after ipilimumab + nivolumab, independent of neoadjuvant or adjuvant treatment. None of the patients with a high or intermediate IFN-γ signature had relapsed at data cutoff. | NCT02437279 /(OpACIN) Blank CU et al. 2018 [11] Rozeman EA et al., 2021 [12] |
| | Palpable Stage III Melanoma | **Arm 1 (n = 30)**: Ipilimumab (3 mg/kg) + Nivolumab (1 mg/kg) 2 cycles, once every 3 weeks **Arm 2 (n = 30)**: | 2 | 86 Active, Not recruiting | Non-Randomized Single group assignment Open label | **irAEs grade 3–4 first 12 weeks**: Arm1 = 12 (40%) of 30, Arm 2 = 6 (20%) of 30, Arm 3 = 13 (50%) of 26. Arm C was closed early for safety reason.<br>**AEs (Difference in grade 3–4 toxicity):** between Arm 2 and 1 was −20% (95% CI −46 to 6; p=0·158) and between Arm 3 and Arm 1 was 10% (−20 to 40; p=0·591).<br>**Radiological objective response**: Arm 1 = 19 (63% [95% CI 44–80]) of 30, Arm 2 = 17 (57% [37–75]) of 30, Arm 3 = 9 (35% [17– | PD-1 expression not significantly associated with response high IFN-γ score associated with pathologic response and low risk of relapse<br>No significant difference in pRRs observed according to BRAFV600 status<br>High TMB and high IFN-γ score associated with pathologic response and low risk of relapse; pRR was 100% in patients with | NCT02977052 /(OpACIN-Neo) Rozeman EA et al. 2019 [13] Rozeman EA et al., 2021 [12] |

| Disease category | Tumor Type | Treatment | Phase | Number of patients enrolled/to enroll Status | Design | Endpoints/Results | Biomarkers analysis/Results | NCT Reference |
|---|---|---|---|---|---|---|---|---|
| | | Ipilimumab (1 mg/kg) + Nivolumab (3 mg/kg) 2 cycles, once every 3 weeks **Arm 3 (n = 26)**: Ipilimumab (3 mg/kg) 2 cycles, once every 3 weeks directly followed by Nivolumab (3 mg/kg) 2 cycles, once every 2 weeks | | | | 56]) of 26<br>**Pathological responses:** Arm 1 = 24 (80% [61–92]), Arm 2 = 23 (77% [58–90]), Arm 3 = 17 (65% [44–83]).<br>**2-year estimated RFS**: 84% for all patients, 97% for patients achieving a pathologic response and 36% for non-responders (P < 0.001) | high IFN-γ score/high TMB; patients with high IFN-γ score/low TMB or low IFN-γ score/high TMB had pRRs of 91% and 88%; while patients with low IFN-γ score/low TMB had a pRR of only 39%.<br>Higher levels of all immune cell populations were found in responders<br>Olink proteomic assay, evaluating 92 immuno-oncology-related markers: significant increase in almost all markers after neoadjuvant treatment. Highest post-treatment increases for PD-1 (P < 0.0001), CXCL9 (P < 0.0001) and CXCL10 (P < 0.0001), irrespective of response. | |
| | Stage III or Oligometastatic Stage IV Melanoma | Relatimab 160 mg IV + Nivolumab 480 mg IV every 28 days x 2 cycles pre surgery and up to 10 cycles ad adjuvant post surgery | 2 | 30<br>Active, Not recruiting | Single group assignment | **Pathologic response**:<br>pCR rate = 59%, near pCR = 7%, major pathologic response (MPR, pCR + near pCR) = 66%, pPR = 7% , and pNR = 27% pNR<br>**ORR** = 57% (median follow up of 16.2 months).<br>**1 -year EFS** = 90%, RFS = 93%, and OS = 95%.<br>**1-year RFS:** MPR = 100%, non-MPR = 80% (p = 0.016).<br>G**rade 3/4 AEs**:<br>- None during NT<br>- 26% during adjuvant treatment | Ongoing | NCT02519322<br>Amaria RN et al. 2021 [14] |
| | Stage IIIB-C Melanoma or oligometastatic stage IV with BRAFV600 mutation | **Arm 1**: Surgery + possible adjuvant SOC (n = 7)<br><br>**Arm 2**: | 2 | 21<br>Active, Recruiting | Randomized (1:2)<br>Open label | Trial stopped early after a prespecified interim safety analysis revealed significantly longer EFS with neoadjuvant plus adjuvant dabrafenib and trametinib than with standard of care.<br><br>**median follow-up of 18·6 months:** | Patients achieving PCR had significantly lower baseline pERK positivity or non-viable melanoma. pCR was associated with significantly decreased expression of TIM-3 and LAG-3 on CD8+ PD-1 T cells within baseline tumors. | NCT02231775<br>Amaria RN et al., 2018 [15] |

| Disease category | Tumor Type | Treatment | Phase | Number of patients enrolled/to enroll Status | Design | Endpoints/Results | Biomarkers analysis/Results | NCT Reference |
|---|---|---|---|---|---|---|---|---|
| | | Neoadjuvant dabrafenib + trametinib for 8 weeks followed by adjuvant dabrafenib + trametinib for up to 44 weeks (n = 14) | | | | **Patients alive without disease progression**: Arm 2 = 71 %, Arm 1 = 0 %<br>**median EFS**: Arm 2 = 19.7 months [16·2-not estimable], Arm 1 = 2·9 months [95% CI 1·7-not estimable]; hazard ratio 0·016, 95% CI 0·00012-0·14, p<0·0001).<br>**AEs**: Arm 2 = no grade 4 AEs or treatment-related deaths. | | |
| | Resectable Stage IIIB-C melanoma with BRAFV600 Mutation | Dabrafenib + trametinib for 12 weeks pre surgery followed by continued systemic adjuvant therapy post surgery for up to 40 weeks | 2 | 35 Active, Not recruiting | Single group assignment Open label | **Median follow-up was 27 months (IQR 21-36).**<br>**At resection:**<br>- 30 (86%) patients achieved a RECIST response: **CR**: 16 (46%; 95% CI 29-63), **PR**: 14 (40%; 24-58)<br>- **SD**: 5 (14%; 95% CI 5-30)<br>- **Progression**: 0 patients.<br>**After resection and pathological evaluation:**<br>- all 35 patients achieved a pathological response: **pCR** = 17 (49%; 95% CI 31-66), **non-pCR** = 18 (51%; 95% CI 34-69.<br>**SAEs**: 6 (17%) of 35 patients<br>**Grade 3-4 AEs**: 10 (29%) patients.<br>No treatment-related deaths were reported | pCR was associated with significantly higher proportion of Ki67+, PD-L1+, SOX10+ melanoma cells at baseline, and a higher density of intratumoural CD8+ T cells | NCT01972347 /(NeoCombi) Long GV et al., 2019 [16] |
| | unresectable BRAF-mutated locally advanced stage IIIC or oligometastatic stage IV melanoma | dabrafenib + trametinib | 2 | 21 | Single group assignment Open label | **Resection** performed in 18/21 (86%) patients (17 were R0 resections).<br>**Median follow-up of 50 months (IQR 37.7–57.1 months)**:<br>- **median RFS** in patients undergoing surgery = 9.9 months (95% confidence interval 7.52-not reached) | NA | Blankenstein SA et al., 2021 [17] |

| Disease category | Tumor Type | Treatment | Phase | Number of patients enrolled/to enroll Status | Design | Endpoints/Results | Biomarkers analysis/Results | NCT Reference |
|---|---|---|---|---|---|---|---|---|
| **Gastro intestinal** | Localized esophageal or GE junction cancer, amenable to surgical resection | **Arm 1:** Surgery + neoadjuvant chemoradiotherapy **Arm 2:** Surgery alone | 3 | 368 Completed | Randomized, Parallel assignment, Open label | **median OS:** Arm 1 = 48.6, Arm 2 = 24.0 months, HR 0.68 **median PFS**: Arm 1 = 37.7, Arm 2 = 16.2 months, HR 0.64 **Overall progression:** Arm 1 = 49%, Arm 2 = 66%, HR 0.58 | NA | CROSS/NTR487 Shapiro J et al., 2015 [18] van Heijl M et al., 2008 [19] van Hagen P et al., 2012 [20] |
| | Local-regional esophageal carcinoma, no prior therapy | Arm 1: Surgery + neoadjuvant chemoradiotherapy Arm 2: Surgery alone | | 113 Completed | Randomized, Parallel assignment, Open label | **pCR:** Arm 1 = 25% **median survival**: Arm 1 = 16 months, Arm 2 = 11 months, p=0.01 | NA | Walsh TN et al., 1996 [21] |
| | Gastric or GE junction adenocarcinoma, medically and technically operable with no distant metastases | **Arm 1:** Perioperative FLOT **Arm 2:** Perioperative ECF/ECX | 2/3 | 716 Completed | Randomized, Parallel assignment, Open label | **median OS:** Arm 1 = 50 months, Arm 2 = 35 months, HR 0.77 **median PFS:** Arm 1 = 30 months, Arm 2 = 18 months, HR 0.75 | NA | NCT01216644 /FLOT4-AIO Al-Batran SE et al., 2019 [22] |
| | Local-regional thoracic esophageal or gastroesophageal junction carcinoma | **Arm 1:** CRT + surgery **Arm 2:** Induction chemotherapy + CRT + surgery | 2 | 126 Completed | Randomized, Parallel assignment, Open label | **pCR:** Arm 1 = 13%, Arm 2 = 26% **OS:** no significant difference **DFS:** no significant difference | NA | NCT00525915 Ajani JA et al., 2013 [23] |
| | Previously | **Arm 1:** | 3 | 1007 | Randomized, | **Primary:** EFS, pCR, OS, AEs | PD-L1 expression | NCT03221426 |

| Disease category | Tumor Type | Treatment | Phase | Number of patients enrolled/to enroll Status | Design | Endpoints/Results | Biomarkers analysis/Results | NCT Reference |
|---|---|---|---|---|---|---|---|---|
| | untreated localized gastric or GEJ adenocarcinoma | Perioperative pembrolizumab + chemotherapy **Arm 2:** Perioperative placebo + chemotherapy **Arm 3:** Perioperative pembrolizumab + FLOT **Arm 4:** Perioperative placebo + FLOT | | Active, not recruiting | Parallel assignment, Double-blind, Placebo-controlled | **Secondary:** DFS | | /KEYNOTE-585 Bang YJ et al., 2019 [24] |
| | Previously untreated locoregional esophageal or GEJ adenocarcinoma, eligible for surgical resection | **Arm 1**: Carboplatin, paclitaxel, radiation therapy **Arm 2:** Carboplatin, paclitaxel, radiation therapy, nivolumab **Arm 3:** Nivolumab **Arm 4:** Nivolumab, ipilimumab | 2/3 | 278 Active, Recruiting | Randomized, Parallel assignment, Open label | **Primary:** pCR, DFS **Secondary:** AEs, OS **Other:** % change in mean volumetric apparent diffusion coefficient (ADC) | NA | NCT03604991 /EA2174 Eads JR et al., 2020 [25] |
| | Previously | **Arm 1:** | 3 | 900 | Randomized, | **Primary:** EFS | NA | NCT04592913 |

| Disease category | Tumor Type | Treatment | Phase | Number of patients enrolled/to enroll Status | Design | Endpoints/Results | Biomarkers analysis/Results | NCT Reference |
|---|---|---|---|---|---|---|---|---|
| | untreated locoregional gastric or GEJ adenocarcinoma, eligible for surgical resection | placebo + FLOT **Arm 2:** durvalumab + FLOT | | Active, Recruiting | Double-blind, Placebo-controlled study | **Secondary:** OS, pCR | | /MATTERHORN Janjigian YY, et al., 2021 [26] |
| | MSI-H/dMMR locally advanced rectal adenocarcinoma | Neoadjuvant nivolumab, ipilimumab, RT | 2 | 13 Active, Recruiting | Single-arm | **Primary:** pCR **Secondary:** sphincter preservation, DFS, OS, AEs | NA | NCT04751370 /EA2201 NA |
| **Gynecologic** | Ovarian cancer, fallopian tube cancer, and peritoneal neoplasms | **Arm 1**: placebo + paclitaxel + carboplatin + Bevacizumab **Arm 2**: atezolizumab + paclitaxel + carboplatin + Bevacizumab | 3 | 1301 Active, Not recruiting | Randomized Parallel assignment Placebo-Controlled Double masking | **PFS ITT population**: Arm1 18.4 months, Arm 2 = 19.5 months (HR 0.92; 95% CI, 0.79 to 1.07; stratified log-rank P 5 .28) **PFS PD-L1 positive population**: Arm 1 = 18.5 months, Arm 2 = 20.8 months (HR 0.80; 95% CI, 0.65 to 0.99; P 5 .038)) **Two-year OS rates ITT population**: Arm 1 = 79% (95% CI, 75 to 83), Arm 2 were 81% (95% CI, 77 to 84) **Two-year OS rates PD-L1–positive**: Arm 1 = 83% (95% CI, 78 to 87, Arm2 = 82% (95% CI, 77 to 87) **OR ITT population (in response-evaluable patients)**: Arm 1 = 212 of 239 (89%; 95% CI, 84 to 92), Arm 2 = 233 of 251 (93%; 95% CI, 89 to 96). **OR ITT population PD-L1–positive population (in response-evaluable patients)**: Arm 1= 142 of 158 (90%; 95% CI, 84 to 94) Arm 2 = 156 of 169 (92%; 95% CI, 87 to 96) **AEs**: most common grade 3 and 4 - neutropenia (21% with atezolizumab v 21% with placebo),hypertension (18% v 20%, respectively), and anemia (12% v 12%) | PK | NCT03038100 /(IMagyn050) Moore KN et al. 2021 [27] |
| | Advanced (stage IVB) | **Arm 1**: cisplatin + | 3 | 513 (434 | Randomized Parallel | **Early closure for futility.** **HR of death** Arm 2, 3, 4 to Arm 1: Arm 2 = | NA | NCT00064077 Monk BJ et al |

| Disease category | Tumor Type | Treatment | Phase | Number of patients enrolled/to enroll Status | Design | Endpoints/Results | Biomarkers analysis/Results | NCT Reference |
|---|---|---|---|---|---|---|---|---|
| | recurrent or persistent carcinoma of the uterine cervix who were unsuitable candidates for curative treatment with surgery and/or radiotherapy | paclitaxel (reference arm) **Arm 2**: cisplatin + vinorelbin **Arm 3**: cisplatin + gemcitabine **Arm 4**: cisplatin + topotecan | | evaluable for efficacy, 425 evaluable for toxicity) Completed | Assignment Open label | 1.15 (95% CI, 0.79 to 1.67), Arm 3 = 1.32 (95% CI, 0.91 to 1.92), Arm 4 = 1.26 (95% CI, 0.86 to 1.82). **HR PFS**: Arm 2 = 1.36 (95% CI, 0.97 to 1.90), Arm 3 = 1.39 (95% CI, 0.99 to 1.96), Arm 4 = 1.27 (95% CI, 0.90 to 1.78) for TC. **RR**: Arm 1 = 29.1%, Arm 2 = 25.9%, Arm 3 = 22.3%, Arm 4 = 23.4%. **AEs:** All arms comparable except for leucopenia, neutropenia, infection, and alopecia | | 2009 [28] |
| | stage IIIC/IV ovarian, tubal or peritoneal HGSC | **Arm 1**: pembrolizumab + chemotherapy +/- bevacizumab **Arm 2**: chemotherapy alone +/- bevacizumab | 2 | 91 Active, Not recruiting | Randomized Parallel Assignment Open label | **Primary**: Complete resection rate (CRR) **Secondary**: CCI score, PCI score, pCR, ORR, Best overall response, PFS, and Biological Progression-Free Interval, OS, AEs, post-operative mortality, post-operative morbidity. **Preliminary results**: CRR: Arm1 = 74%, Arm 2 = 70%, ORR: Arm 1 = 76%, Arm2 = 61%, AEs: Arm1 = 75%, Arm2 = 61%, PFS at 18 months: Arm1 = 61%, Arm2 = 57% | PDL1 | NCT03275506 Ray-Coquard IL et al., 2019 [29] |
| **HNSCC** | Previously untreated HNSCC | Neoadjuvant motolimod + cetuximab | 1b | 14 Completed | Single-arm | After treatment, there were changes in activation and numbers of immune effector cell biomarkers: CD141+ and CD1c+ mDC increased; CD80 and CD16 upregualated; lower levels of CTLA-4, CD73, TGFb; increased inflammatory cytokines. | | NCT02124850 Shayan G et al., 2018 [30] |
| | Previously untreated, resectable HNSCC **Cohort A**: HPV-positive tumors **Cohort B:** HPV-negative tumors | Neoadjuvant nivolumab | 1/2 | 52 Active, Not recruiting | Single-arm | **Radiographic response rate:** Cohort A = 56.0%, Cohort B = 41.7% **pCR:** no pCR in either cohort **MPR+pPR:** Cohort A = 23.5%, Cohort B = 5.9% **RFS (24 months):** Cohort A = 88.2, B = 54.2 **median OS:** Cohort A = NR, B = 49.8 months | **median TMB:** Cohort A = 27, B = 71 **RNAseq:** Cohort A had a more inflammatory microenvironment than Cohort B. Correlation between TMB or gene expression and response could not be evaluated. | NCT02488759 /CheckMate358 Ferris RL et al., 2021 [31] |

| Disease category | Tumor Type | Treatment | Phase | Number of patients enrolled/to enroll Status | Design | Endpoints/Results | Biomarkers analysis/Results | NCT Reference |
|---|---|---|---|---|---|---|---|---|
| | untreated SCC of the oral cavity | **Arm 1:** neoadjuvant nivolumab with ipilimumab **Arm 2:** neoadjuvant nivolumab | 2 | 29 Active, Not recruiting | Randomized, Parallel assignment, Open label | **Volumetric response:** Arm 1 = 53%, Arm 2 = 50% **RECIST response:** Arm 1 = 38%, Arm 2 = 13% **PTR1:** Arm 1 = 40%, Arm 2 = 38% **PTR2**: Arm 1 = 33%, Arm 2 = 15% **pNC+pCR:** Arm 1 = 20%, Arm 2 = 8% | **PD-L1** expression was not correlated with response in either arm. **CD4-positive T-cells** associated with degree of pathological response. | NCT02919683 Schoenfeld JD et al., 2020 [32] |
| | previously untreated, locally advanced, resectable HNSCC | **Arm 1:** **n**ivolumab + relatlimab **Arm 2:** nivolumab + ipilimumab **Arm 3:** nivolumab | 2 | 60 Active, Recruiting | Randomized, Parallel assignment, Open label | **Primary:** AEs **Secondary:** Radiographic response, TIL, PBL, CD4+ cells, CD8+ cells | TMB, gene expression, single cell RNAseq pathways | NCT04080804 NA |
| | previously untreated, resectable HNSCC | **Arm 1:** ceralasertib **Arm 2:** olaparib | 1 | 21 Completed | Randomized, Parallel assignment, Open label | Response of immunological based 25-gene signature | | NCT03022409 Duvvuri U et al., 2018 [33] |
| | previously untreated, unresectable HNSCC | **Arm 1:** pembrolizumab + cisplatin + CRT **Arm 2:** placebo + cisplatin + CRT | 3 | 780 Active, Not recruiting | Randomized, Parallel assignment, Double-blind, Placebo-controlled | **Primary:** EFS **Secondary:** OS, AEs, QOL, swallowing, speech, and pain symptoms, physical functioning | | NCT03040999 /KEYNOTE-412 Machiels JP et al., 2020 [34] |

| Disease category | Tumor Type | Treatment | Phase | Number of patients enrolled/to enroll Status | Design | Endpoints/Results | Biomarkers analysis/Results | NCT Reference |
|---|---|---|---|---|---|---|---|---|
| **NSCLC** | Surgically resectable stage I, II, or IIIA NSCLC | nivolumab (3 mg/Kg) | Pilot | 22 Active, Recruiting | Single group assignment Open label | **AEs**: 5 of 22 patients (23%; 95% confidence interval [CI], 7.8 to 45.4). Only one event was of grade 3 or higher.<br>**Radiographic results: PR**: (10%), **SD**: 18 (86%), **PD**: 1 (5%)<br>**Survival and RFS: at median of 12** months of postoperative (range, 0.8 to 19.7): 16 of 20 patients (80%) who had undergone surgical resection were alive and recurrence-free<br>**RFS at 18 months**: 73 %<br>**Pathological response:**<br>**- MPR**: 9 of 20 patients (45%; 95% CI, 23 to 68)<br>- **pCR in primary tumor**= 3 patients | Responses occurred in both PD-L1–positive and negative tumors<br>**Genomic response (11 patients):** Significantly higher mean TMB observed in tumors with a MPR than in tumors without MPR (311±55 vs. 74±60, P=0.01).<br>No significant correlation between TMB and tumor PD-L1 expression.<br>Systematic increase after PD-1 blockade of number of T-cell clones in tumor and peripheral blood in 8 of 9 evaluated patients.<br>Post treatment, tumor heavily infiltrated with CD8 + cytotoxic T cells<br>Correlation between depth of pathological response overall and the number of non-synonymous mutations<br>Early ctDNA dynamics predicted PR to neoadjuvant nivolumab | NCT02259621 Forde PM et al., 2018 [35] Anagnostou V et al., 2019 [36] |
| | Surgically resectable stage I-IIIA NSCLC | **Arm 1**: nivolumab **Arm 2**: nivolumab + ipilimumab | 2 | 44 Active, Recruiting | Randomized Parallel Assignment Open label | **MPR**: Arm 1 = 22% (5/23), Arm 2 = 38% (8/21)<br>**pCR**: Arm 1 = 10%, Arm 2 = 38%<br>**Viable tumor (median)**: Arm 1 = 50%, Arm 2 = 9% | Greater frequencies of effector, tissue-resident memory and effector memory T cells in dual therapy versus nivolumab alone.<br>Increased abundance of gut Ruminococcus and Akkermansia spp. associated with MPR to dual therapy. | NCT03158129 /(NEOSTAR) Cascone T et al., 2021 [37] |
| | Surgically resectable stage IA-IIIB NSCLC | sintilimab | 1b | 40 (37 resection) | Single group assignment Open label | **AEs**: 21 patients (52.5%) - grade 3 or higher = 4 patients (10.0%) , grade 5 = 1 patient.<br>**Radiological partial response**: 8 patients (ORR 20%)<br>**Pathological response:**<br>- **MPR**: 40.5% (15/37) - Squamous cell NSCLC > adenocarcinoma (MPR: 48.4% versus 0%).<br>- **pCR in primary tumor**: 16.2% (6/37)<br>- **pCR lymph nodes**: 8.1% (3/37) | Baseline PDL-1 expression of stromal cells instead of tumor cells was correlated with pathologic regression (p = 0.0471) | (ChiCTR-OIC-17013726) Gao S et al. 2020 [38] |
| | Surgically | Pembrolizum | 2 | 35 | Single group | **AEs:** diarrhea (n = 7; 23%); fatigue (n = 5; | NA | NCT02818920 |

| Disease category | Tumor Type | Treatment | Phase | Number of patients enrolled/to enroll Status | Design | Endpoints/Results | Biomarkers analysis/Results | NCT Reference |
|---|---|---|---|---|---|---|---|---|
| | resectable stage IB,IIB,IIIA NSCLC | ab | | (30 treated, 25 resection) Active, Not recruiting | assignment Open label | 17%); rash (n = 4, 13%); and arthralgia, hypothyroidism, and pruritus (each n = 3; 10%).<br>**R0 resection**: 22 patients (88%)<br>**MPR**: 7 of 25 patients (28%)<br>**Pathological response greater than 50%**: 20 tumors (80%)<br>**pCR in tumor**: 3 (12 %) | | /(TOP 1501) Tong BC et al., 2022 [39] |
| | Surgically resectable stage IB-IIIB NSCLC | Atezolizumab | 2 | **181** (159 resection) Active, Not recruiting | Single group assignment Open label | **TRAEs:**<br>- Grade 3-4: pre-operative = 9 (5%), post-operative = 20 (13%)<br>- Grade 5: pre-operative = 0, post-operative = 1<br>**irAEs:**<br>- Grade 3-4: pre-operative = 4 (2%), post-operative = 12 (8%)<br>- Grade 5: pre-operative = 0, post-operative = 1<br>**Patients without EGFR/ALK mutations who underwent surgery:**<br>- **MPR**: 20% (30/147; 95% CI: 14%-28%)<br>- **pCR**: 7% (10/147; 95% CI: 3%-12%)<br>**R0**: 145/159 (91%) | NA | NCT02927301 Lee JM et al., 2021 [40] |
| | Surgically resectable stage II-IIIB NSCLC (T3N2 only) | **Arm 1**: nivolumab + platinum-based doublet chemotherapy<br>**Arm 2**: placebo + platinum-based doublet chemotherapy | 3 | **452** Active, Recruiting | Randomized Parallel assignment Placebo-Controlled Double masking | **Primary**: EFS<br>**Secondary**: OS, pCR, MPR, SAEs, AEs | NA | NCT04025879 /(CheckMate 77T) Cascone T et al., 2020 [41] |
| | Surgically resectable stage II, IIIA, IIIB (T3-4N2) | **Arm 1**: pembrolizumab + platinum- | 3 | **786** Active, Not recruiting | Randomized Parallel assignment Placebo- | **Primary**: EFS, OS<br>**Secondary**: MPR, pCR, QoL, AEs, perioperative complications, treatment discontinuation due to AEs | NA | NCT03425643 /(MK-3475-671/KEYNOTE-671) |

| Disease category | Tumor Type | Treatment | Phase | Number of patients enrolled/to enroll Status | Design | Endpoints/Results | Biomarkers analysis/Results | NCT Reference |
|---|---|---|---|---|---|---|---|---|
| | NSCLC | based doublet chemotherapy **Arm 2**: placebo + platinum-based doublet chemotherapy | | | Controlled Double masking | | | Tsuboi M et al., 2020 [42] |
| | Surgically resectable stage II and III NSCLC | **Arm 1**: Durvalumab + platinum-based chemotherapy **Arm 2**: Placebo + platinum-based chemotherapy | 3 | **800** Active, Recruiting | Randomized Parallel assignment Placebo-Controlled Double masking | **Primary**: pCR, EFS **Secondary**: DFS, mPR, OS, in PD-L1-TC ≥1% positive patients: EFS, pCR, DFS, MPR, OS, QoL, PK durvalumab in blood, presence of ADA for durvalumab, AEs | NA | NCT03800134 /(AEGEAN) Heymach JT et al., 2019 [43] |
| | Surgically resectable stage II, IIIA, or Select IIIB | **Arm 1**: Atezolizumab + platinum-based chemotherapy **Arm 2**: Placebo + platinum-based chemotherapy | 3 | **453** Active, Not recruiting | Randomized Parallel assignment Placebo-Controlled Double masking | **Primary**: EFS **Secondary**: pCR, MPR, OR, EFS, DFS, OS, QoL, AEs, Number of surgical delays, Length of surgical delays, Number of operative and post-operative complications, reasons for surgical cancellations, minimum and maximum observed serum atezolizumab concentration, Percentage of participants with anti-drug antibody (ADA) to atezolizumab | Ongoing | NCT03456063 /(IMpower 30) Peters SK et al., 2019 [44] |
| | Surgically resectable stage IB to IIIA NSCLC and no known | **Arm 1**: platinum-based chemotherapy | 3 | **358** Active, Not recruiting | Randomized Parallel assignment Double masking | **pCR** (ITT population): Arm 1 = 2.2%, Arm 2 = 24.0%; odds ratio 13.94 [99% CI 3.49-55.75]; P < 0.0001). Improvement consistent across subgroup of disease stage and TMB | ctDNA more likely to clear when nivolumab given with chemotherapy (56%) versus chemotherapy alone (34%) pCR more likely to be achieved | NCT02998528 /(CheckMate 816) Forde PM et al., 2021 [45] |

| Disease category | Tumor Type | Treatment | Phase | Number of patients enrolled/to enroll Status | Design | Endpoints/Results | Biomarkers analysis/Results | NCT Reference |
|---|---|---|---|---|---|---|---|---|
| | EGFR/ALK alterations | **Arm 2**: nivolumab + platinum-based chemotherapy | | | | **MPR** (ITT population): Arm 1 = 8.9%, Arm 2 = 36.9%<br>**ORR** (ITT population): Arm 1 = 37.4%, Arm 2 = 53.6%<br>**Radiographic down-staging** (ITT population): Arm 1 = 23.5%, Arm 2 = 30.7%<br>**Definitive surgery**: Arm 1 = 74.4% of patients, Arm 2 = 83.2% of patients.<br>**TRAEs grade 3-4** : Arm 1 = 36.9%, Arm 2 = 33.5%<br>**Surgery-related AEs grade 3-4** : Arm 1 = 14.8%, Arm 2 = 11.4% | with clearance of ctDNA: pCR = 46% in patients with ctDNA clearance versus 13% in those without it<br>Patients with pCR and clearance of ctDNA were more likely to have surgical resection | |

**AEs:** Adverse events; **CI:** Confidence interval; **CR:** Complete response; **DFS:** Disease free survival; **EFS:** event free survival; **HR:** Hazard ratio**; irAEs:** Immune related adverse events; **ITT:** Intention to treat; **MPR:** Major pathological response; **NT:** Neoadjuvant treatment; **ORR:** overall response rate; **OS:** overall survival; **pCR:** Pathological complete response; **PD:** Progressive disease; **pNC:** Pathological near-complete; **pNR:** Pathological persistence of tumor ; **pPR:** Pathological partial response; **pRR:** Pathological response rate; **PR:** Partial response; **QOL:** Quality of life; **RFS:** Recurrence free survival; **RR:** Response rate; **SAEs:** Serious adverse events; **SD:** Stable disease; **TMB:** Tumor mutational burden, **TRAEs:** Treatment related adverse events.

## REFERENCES

1. Moschos SJ, Edington HD, Land SR, et al. Neoadjuvant treatment of regional stage IIIB melanoma with high-dose interferon alfa-2b induces objective tumor regression in association with modulation of tumor infiltrating host cellular immune responses. *J Clin Oncol* 2006;24:3164-3171. doi: 10.1200/JCO.2005.05.2498.
2. Wang W, Edington HD, Rao UN, et al. Modulation of signal transducers and activators of transcription 1 and 3 signaling in melanoma by high-dose IFNalpha2b. *Clin Cancer Res* 2007;13:1523-31. doi: 10.1158/1078-0432.CCR-06-1387.
3. Tarhini AA, Edington H, Butterfield LH, et al. Immune monitoring of the circulation and the tumor microenvironment in patients with regionally advanced melanoma receiving neoadjuvant ipilimumab. *PloS one* 2014;9:e87705. doi: 10.1371/journal.pone.0087705.
4. Tarhini AA, Lin Y, Lin H-M, et al. Expression profiles of immune-related genes are associated with neoadjuvant ipilimumab clinical benefit. *Oncoimmunology* 2017;6:e1231291. doi: 10.1080/2162402X.2016.1231291.
5. Retseck J, Nasr A, Lin Y, et al. Long term impact of CTLA4 blockade immunotherapy on regulatory and effector immune responses in patients with melanoma. *J Transl Med* 2018;16:184. doi: 10.1186/s12967-018-1563-y.
6. Tarhini A, Lin Y, Lin H, et al. Neoadjuvant ipilimumab (3 mg/kg or 10 mg/kg) and high dose IFN-alpha2b in locally/regionally advanced melanoma: safety, efficacy and impact on T-cell repertoire. *J Immunother Cancer* 2018;6:112. doi: 10.1186/s40425-018-0428-5.

7. Huang AC, Orlowski RJ, Xu X, et al. A single dose of neoadjuvant PD-1 blockade predicts clinical outcomes in resectable melanoma. *Nat Med* 2019;25:454-461. doi: 10.1038/s41591-019-0357-y.
8. Najjar YG, McCurry D, Lin H, et al. Neoadjuvant Pembrolizumab and High-Dose IFNalpha-2b in Resectable Regionally Advanced Melanoma. *Clin Cancer Res* 2021;27:4195-4204. doi: 10.1158/1078-0432.CCR-20-4301.
9. Andtbacka RHI, Dummer R, Gyorki DE, et al. Interim analysis of a randomized, open-label phase 2 study of talimogene laherparepvec (T-VEC) neoadjuvant treatment (neotx) plus surgery (surgx) vs surgx for resectable stage IIIB-IVM1a melanoma (MEL). *J Clin Oncol* 2018;36:9508-9508. doi: 10.1200/JCO.2018.36.15_suppl.9508.
10. Amaria RN, Reddy SM, Tawbi HA, et al. Neoadjuvant immune checkpoint blockade in high-risk resectable melanoma. *Nat Med* 2018;24:1649-1654. doi: 10.1038/s41591-018-0197-1.
11. Blank CU, Rozeman EA, Fanchi LF, et al. Neoadjuvant versus adjuvant ipilimumab plus nivolumab in macroscopic stage III melanoma. *Nat Med* 2018;24:1655-1661. doi: 10.1038/s41591-018-0198-0.
12. Rozeman EA, Hoefsmit EP, Reijers ILM, et al. Survival and biomarker analyses from the OpACIN-neo and OpACIN neoadjuvant immunotherapy trials in stage III melanoma. *Nat Med* 2021;27:256-263. doi: 10.1038/s41591-020-01211-7.
13. Rozeman EA, Menzies AM, van Akkooi ACJ, et al. Identification of the optimal combination dosing schedule of neoadjuvant ipilimumab plus nivolumab in macroscopic stage III melanoma (OpACIN-neo): a multicentre, phase 2, randomised, controlled trial. *Lancet Oncol* 2019;20:948-960. doi: 10.1016/S1470-2045(19)30151-2.
14. Amaria RN, Postow MA, Tetzlaff MT, et al. Neoadjuvant and adjuvant nivolumab (nivo) with anti-LAG3 antibody relatlimab (rela) for patients (pts) with resectable clinical stage III melanoma. *J Clin Oncol Abstract 2021 ASCO Annual Meeting* 2021;39:9502-9502. doi: 10.1200/JCO.2021.39.15_suppl.9502.
15. Amaria RN, Prieto PA, Tetzlaff MT, et al. Neoadjuvant plus adjuvant dabrafenib and trametinib versus standard of care in patients with high-risk, surgically resectable melanoma: a single-centre, open-label, randomised, phase 2 trial. *Lancet Oncol* 2018;19:181-193. doi: 10.1016/S1470-2045(18)30015-9.
16. Long GV, Saw RPM, Lo S, et al. Neoadjuvant dabrafenib combined with trametinib for resectable, stage IIIB-C, BRAF(V600) mutation-positive melanoma (NeoCombi): a single-arm, open-label, single-centre, phase 2 trial. *Lancet Oncol* 2019;20:961-971. doi: 10.1016/S1470-2045(19)30331-6.
17. Blankenstein SA, Rohaan MW, Klop WMC, et al. Neoadjuvant Cytoreductive Treatment With BRAF/MEK Inhibition of Prior Unresectable Regionally Advanced Melanoma to Allow Complete Surgical Resection, REDUCTOR: A Prospective, Single-arm, Open-label Phase II Trial. *Ann Surg* 2021;274:383-389. doi: 10.1097/SLA.0000000000004893.
18. Shapiro J, van Lanschot JJB, Hulshof M, et al. Neoadjuvant chemoradiotherapy plus surgery versus surgery alone for oesophageal or junctional cancer (CROSS): long-term results of a randomised controlled trial. *Lancet Oncol* 2015;16:1090-1098. doi: 10.1016/S1470-2045(15)00040-6.
19. van Heijl M, van Lanschot JJ, Koppert LB, et al. Neoadjuvant chemoradiation followed by surgery versus surgery alone for patients with adenocarcinoma or squamous cell carcinoma of the esophagus (CROSS). *BMC Surg* 2008;8:21. doi: 10.1186/1471-2482-8-21.

20. van Hagen P, Hulshof MC, van Lanschot JJ, et al. Preoperative chemoradiotherapy for esophageal or junctional cancer. *N Engl J Med* 2012;366:2074-84. doi: 10.1056/NEJMoa1112088.
21. Walsh TN, Noonan N, Hollywood D, et al. A comparison of multimodal therapy and surgery for esophageal adenocarcinoma. *N Engl J Med* 1996;335:462-7. doi: 10.1056/NEJM199608153350702.
22. Al-Batran SE, Homann N, Pauligk C, et al. Perioperative chemotherapy with fluorouracil plus leucovorin, oxaliplatin, and docetaxel versus fluorouracil or capecitabine plus cisplatin and epirubicin for locally advanced, resectable gastric or gastro-oesophageal junction adenocarcinoma (FLOT4): a randomised, phase 2/3 trial. *Lancet* 2019;393:1948-1957. doi: 10.1016/S0140-6736(18)32557-1.
23. Ajani JA, Xiao L, Roth JA, et al. A phase II randomized trial of induction chemotherapy versus no induction chemotherapy followed by preoperative chemoradiation in patients with esophageal cancer. *Ann Oncol* 2013;24:2844-9. doi: 10.1093/annonc/mdt339.
24. Bang YJ, Van Cutsem E, Fuchs CS, et al. KEYNOTE-585: Phase III study of perioperative chemotherapy with or without pembrolizumab for gastric cancer. *Future Oncol* 2019;15:943-952. doi: 10.2217/fon-2018-0581.
25. Eads JR, Weitz M, Gibson MK, et al. A phase II/III study of perioperative nivolumab and ipilimumab in patients (pts) with locoregional esophageal (E) and gastroesophageal junction (GEJ) adenocarcinoma: A trial of the ECOG-ACRIN Cancer Research Group (EA2174). *J Clin Oncol Abstract 2020 ASCO Annual Meeting* 2020;38:TPS4651-TPS4651. doi: 10.1200/JCO.2020.38.15_suppl.TPS4651.
26. Janjigian YY, Van Cutsem E, Muro K, et al. MATTERHORN: Efficacy and safety of neoadjuvant-adjuvant durvalumab and FLOT chemotherapy in resectable gastric and gastroesophageal junction cancer—A randomized, double-blind, placebo-controlled, phase 3 study. *J Clin Oncol Abstract 2021 ASCO Annual Meeting* 2021;39:TPS4151-TPS4151. doi: 10.1200/JCO.2021.39.15_suppl.TPS4151.
27. Moore KN, Bookman M, Sehouli J, et al. Atezolizumab, Bevacizumab, and Chemotherapy for Newly Diagnosed Stage III or IV Ovarian Cancer: Placebo-Controlled Randomized Phase III Trial (IMagyn050/GOG 3015/ENGOT-OV39). *J Clin Oncol* 2021;39:1842-1855. doi: 10.1200/JCO.21.00306.
28. Monk BJ, Sill MW, McMeekin DS, et al. Phase III trial of four cisplatin-containing doublet combinations in stage IVB, recurrent, or persistent cervical carcinoma: a Gynecologic Oncology Group study. *J Clin Oncol* 2009;27:4649-55. doi: 10.1200/JCO.2009.21.8909.
29. Ray-Coquard I, Pautier P, Pignata S, et al. Olaparib plus Bevacizumab as First-Line Maintenance in Ovarian Cancer. *N Engl J Med* 2019;381:2416-2428. doi: 10.1056/NEJMoa1911361.
30. Shayan G, Kansy BA, Gibson SP, et al. Phase Ib Study of Immune Biomarker Modulation with Neoadjuvant Cetuximab and TLR8 Stimulation in Head and Neck Cancer to Overcome Suppressive Myeloid Signals. *Clin Cancer Res* 2018;24:62-72. doi: 10.1158/1078-0432.CCR-17-0357.
31. Ferris RL, Spanos WC, Leidner R, et al. Neoadjuvant nivolumab for patients with resectable HPV-positive and HPV-negative squamous cell carcinomas of the head and neck in the CheckMate 358 trial. *J Immunother Cancer* 2021;9. doi: 10.1136/jitc-2021-002568.
32. Schoenfeld JD, Hanna GJ, Jo VY, et al. Neoadjuvant Nivolumab or Nivolumab Plus Ipilimumab in Untreated Oral Cavity Squamous Cell Carcinoma: A Phase 2 Open-Label Randomized Clinical Trial. *JAMA Oncol* 2020;6:1563-1570. doi: 10.1001/jamaoncol.2020.2955.
33. Duvvuri U, Dean E, Frewer P, et al. A pre-surgical window of opportunity study to investigate the biomarker effects of DNA damage response (DDR) agents in patients (pts) with head and neck squamous cell carcinoma (HNSCC). *Cancer Res Abstract CT135* 2018;78. doi: https://doi.org/10.1158/1538-7445.AM2018-CT135.

34. Machiels JP, Tao Y, Burtness B, et al. Pembrolizumab given concomitantly with chemoradiation and as maintenance therapy for locally advanced head and neck squamous cell carcinoma: KEYNOTE-412. *Future Oncol* 2020;16:1235-1243. doi: 10.2217/fon-2020-0184.
35. Forde PM, Chaft JE, Smith KN, et al. Neoadjuvant PD-1 Blockade in Resectable Lung Cancer. *N Engl J Med* 2018;378:1976-1986. doi: 10.1056/NEJMoa1716078.
36. Anagnostou V, Forde PM, White JR, et al. Dynamics of Tumor and Immune Responses during Immune Checkpoint Blockade in Non-Small Cell Lung Cancer. *Cancer Res* 2019;79:1214-1225. doi: 10.1158/0008-5472.CAN-18-1127.
37. Cascone T, William WN, Jr., Weissferdt A, et al. Neoadjuvant nivolumab or nivolumab plus ipilimumab in operable non-small cell lung cancer: the phase 2 randomized NEOSTAR trial. *Nat Med* 2021;27:504-514. doi: 10.1038/s41591-020-01224-2.
38. Gao S, Li N, Gao S, et al. Neoadjuvant PD-1 inhibitor (Sintilimab) in NSCLC. *J Thorac Oncol* 2020;15:816-826. doi: 10.1016/j.jtho.2020.01.017.
39. Tong BC, Gu L, Wang X, et al. Perioperative outcomes of pulmonary resection after neoadjuvant pembrolizumab in patients with non-small cell lung cancer. *J Thorac Cardiovasc Surg* 2022;163:427-436. doi: 10.1016/j.jtcvs.2021.02.099.
40. Lee JM, Chaft J, Nicholas A, et al. Surgical and clinical outcomes with neoadjuvant atezolizumab in resectable stage IB–IIIB NSCLC: LCMC3 trial primary analysis. *2020 World Conference on Lung Cancer Abstract PS0205* 2021;16:S59-S61. doi: https://doi.org/10.1016/j.jtho.2021.01.320.
41. Cascone T, Provencio M, Sepesi B, et al. Checkmate 77T: A phase III trial of neoadjuvant nivolumab (NIVO) plus chemotherapy (chemo) followed by adjuvant nivo in resectable early-stage NSCLC. *J Clin Oncol 2020 ASCO Annual Meeting Abstract* 2020;38:TPS9076-TPS9076. doi: 10.1200/JCO.2020.38.15_suppl.TPS9076.
42. Tsuboi M, Luft A, Ursol G, et al. Perioperative pembrolizumab + platinum-based chemotherapy for resectable locally advanced non-small cell lung cancer: The phase III KEYNOTE-671 study. *Ann Oncol* 2020;31:S801-S802. doi: https://doi.org/10.1016/j.annonc.2020.08.1437.
43. Heymach J, Taube J, Mitsudomi T, et al. The AEGEAN Phase 3 Trial of Neoadjuvant/Adjuvant Durvalumab in Patients with Resectable Stage II/III NSCLC. *J Thorac Oncol Poster P118-02* 2019;14:S625-S626. doi: https://doi.org/10.1016/j.jtho.2019.08.1318.
44. Peters S, Kim AW, Solomon B, et al. Impower030: Phase III study evaluating neoadjuvant treatment of resectable stage II-IIIB non-small cell lung cancer (nsclc) with atezolizumab (atezo) + chemotherapy. *Ann Oncol Abstract 82TiP* 2019;30:II30. doi: https://doi.org/10.1093/annonc/mdz064.014.
45. Forde PM, Spicer J, Lu S, et al. Nivolumab (NIVO) + platinum-doublet chemotherapy (chemo) vs chemo as neoadjuvant treatment (tx) for resectable (IB-IIIA) non-small cell lung cancer (NSCLC) in the phase 3 CheckMate 816 trial. *AACR Annual Meeting Abstract CT003* 2021;31. doi: https://doi.org/10.1158/1538-7445.AM2021-CT003.