SUPPLEMENTARY FILES

Supplementary Figure 1. Patient flow chart.

Eligible patients on PREDICT study (N=3,403)

- NCT02478931
- Patients with diverse cancers who had tissue DNA NGS*

Ineligible diagnoses (N=1,863)

Eligible diagnoses** (N=1,540)

- NSCLC [N=364]
- Colorectal [N=301]
- Breast [N=251]
- Melanoma [N=184]
- Pancreatic [N=123]
- Cholangio / HCC [N=112]
- Gastroesophageal [N=107]
- Endometrial*** [N=57]
- Bladder [N=41]

No anti-PD-1/PD-L1 immunotherapy (N=1,165)

Treated with anti-PD-1/PD-L1 immunotherapy (N=375)

- NSCLC [N=111]
- Colorectal [N=49]
- Breast [N=25]
- Melanoma [N=97]
- Pancreatic [N=8]
- Cholangio / HCC [N=15]
- Gastroesophageal [N=21]
- Endometrial [N=23]
- Bladder [N=26]

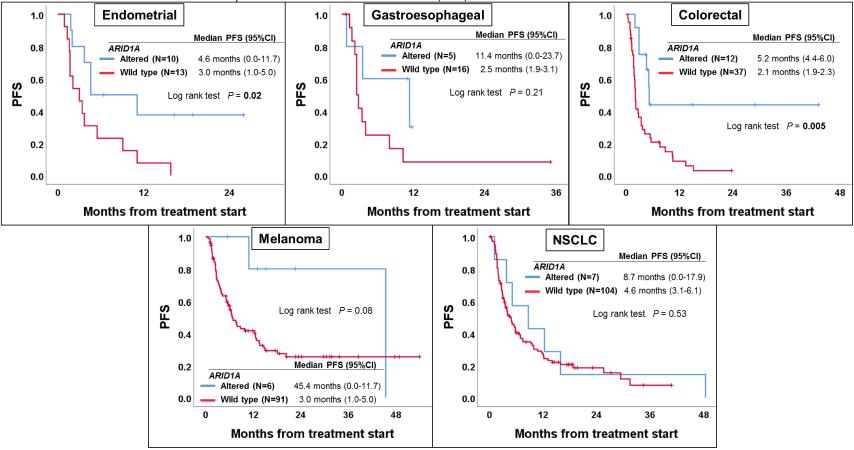
Abbreviations: Bladder, urothelial bladder carcinoma; Breast, breast cancer; Cholangio/HCC, cholangiocarcinoma and hepatocellular carcinoma; Colorectal, colorectal adenocarcinoma; Endometrial, uterine/ovary endometrial (endometrioid) carcinoma; Gastroesophageal, gastric/esophageal adenocarcinoma; NGS, next-generation sequencing; NSCLC, non-small cell lung cancer; Pancreatic, pancreatic ductal adenocarcinoma; PD-1/PD-L1, programmed cell death-1 and its ligand; PREDICT study, Profile-Related Evidence Determining Individualized Cancer Therapy study.

^{*} NGS by Foundation Medicine, Inc.

^{**} These 9 types of cancer harbor ARID1A alterations with frequency >5.0%.

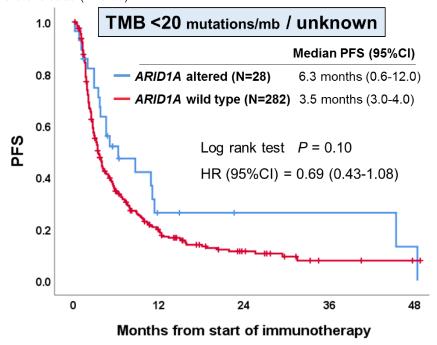
^{***} Includes clear-cell carcinoma which is a rare form of endometrial cancer.

Supplementary Figure 2. Kaplan-Meier curve of progression-free survival among patients who received anti-PD-1/PD-L1 immunotherapy according to cancer types. Breast cancer, pancreatic ductal adenocarcinoma, cholangiocarcinoma/hepatocellular carcinoma, and urothelial bladder carcinoma were not shown because of insufficient numbers of patients with *ARID1A*-altered tumor (N≤2).



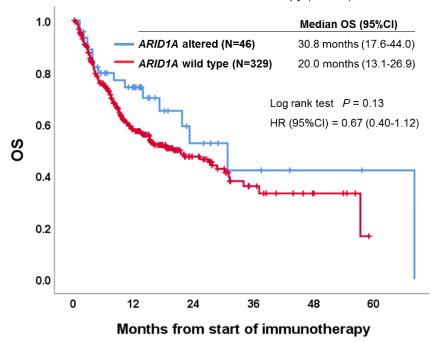
Abbreviations: Colorectal, colorectal adenocarcinoma; Endometrial, uterine/ovary endometrial (endometrioid) carcinoma; Gastroesophageal, gastric/esophageal adenocarcinoma; NSCLC, non-small cell lung cancer; PD-1/PD-L1, programmed cell death-1 and its ligand.

Supplementary Figure 3. Kaplan-Meier curve of progression-free survival among patients without TMB-High who received anti-PD-1/PD-L1 immunotherapy (N=310). Similar results were seen even if the TMB-unknown (N=24) were excluded (*P*=0.09).



Abbreviations: CI, confidence interval; HR, hazard ratio; PD-1/PD-L1, programmed cell death-1 and its ligand; PFS, progression-free survival; TMB, tumor mutational burden.

Supplementary Figure 4. Kaplan Kaplan-Meier curve of overall survival according to *ARID1A* status among patients who received anti-PD-1/PD-L1 immunotherapy (N=375).



Abbreviations: CI, confidence interval; HR, hazard ratio; OS, overall survival; PD-1/PD-L1, programmed cell death-1 and its ligand.