

## Supplementary Materials

**This Supplementary Materials includes the following material:**

- **Table S1.** Comparison of PFS and OS between combination treatments and sunitinib.
- **Figure S1.** Forest plots of HRs with 95%CI for PFS and OS of the six trials against pooled sunitinib controls
- **Figure S2:** Visual representation of indirect treatment comparisons for PFS.
- **Figure S3.** Visual representation of indirect treatment comparisons for OS.

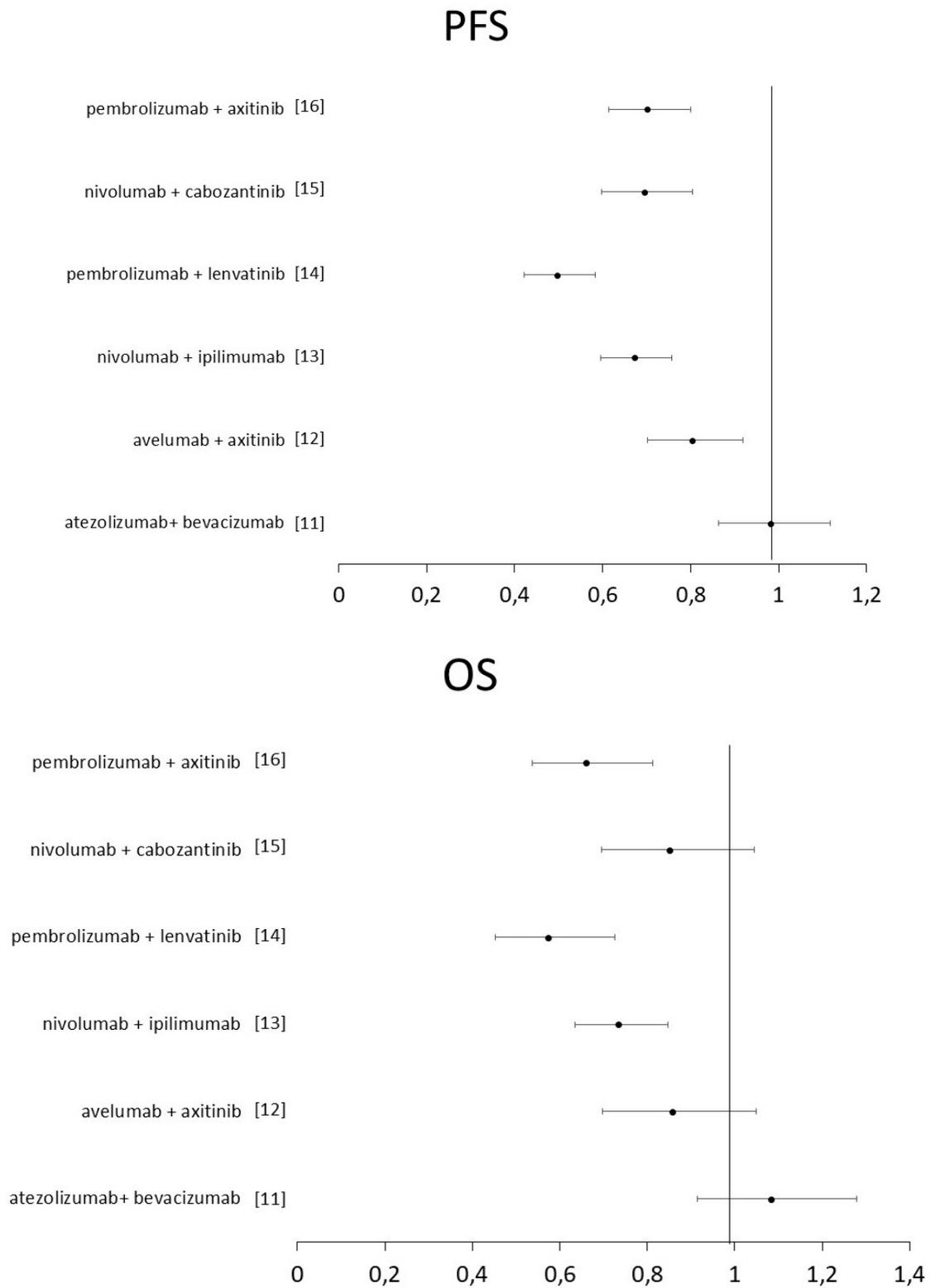
**Table S1.** Results of statistical analysis of the comparison between combination treatments and sunitinib. Upper panel: PFS, Lower panel: OS. Each combination treatment has been compared with the pooled group of 6 sunitinib control arms.

Combination treatment	Median PFS in months (95% CI)		HR (95% CI) §	P
	combination treatment	sunitinib*		
atezolizumab+ bevacizumab [11]	11.45 (9.87 to 13.5)	9.39 (8.12 to 10.10)	0.9822 (0.8637 to 1.117)	0.784
avelumab+ axitinib [12]	13.85 (10.99 to 16.7)	8.17 (6.81 to 10.01)	0.8029 (0.7012 to 0.9193)	0.00148
nivolumab+ ipilimumab [13]	14.29 (12.02 to 18.8)	14.01 (11.80 to 16.34)	0.6718 (0.596 to 0.7571)	<0.001
lenvatinib+ pembrolizumab [14]	24.52 (22.02 to 29.5)	9.83 (7.35 to 10.85)	0.4959 (0.4219 to 0.583)	<0.001
nivolumab+ cabozantinib [15]	17.12 (13.01 to 20.2)	8.67 (7.16 to 9.99)	0.6943 (0.5988 to 0.805)	<0.001
pembrolizumab + axitinib [16]	16.99 (14.21 to 21.1)	11.49 (10.10 to 12.75)	0.701 (0.6142 to 0.8001)	<0.001

\*The median of PFS in the pooled group of 6 sunitinib control arms is 9.92 months (9.53 to 10.09).  
§ Each combination treatment has been compared with the pooled group of 6 sunitinib control arms.

Combination treatment	Median OS in months (95% CI)		HR (95% CI) §	P
	combination treatment	sunitinib*		
atezolizumab+ bevacizumab [11]	35.5 (28.9 to NA)	35.1 (27.7 to NA)	1.0818 (0.9148 to 1.2794)	0.358
avelumab+ axitinib [12]	NA (30.0 to NA)	NA (27.9 to NA)	0.8562 (0.6984 to 1.0496)	0.135
nivolumab+ ipilimumab [13]	59.2 (48.0 to 70.3)	41.2 (35.6 to 49.6)	0.7338 (0.6348 to 0.8482)	<0.001
lenvatinib+ pembrolizumab [14]	NA (NA to NA)	NA (NA to NA)	0.5731 (0.4522 to 0.7263)	<0.001
nivolumab+ cabozantinib [15]	37.9 (36.3 to NA)	34.3 (29.6 to NA)	0.8516 (0.6946 to 1.0440)	0.122
pembrolizumab + axitinib [16]	NA (NA to NA)	36.9 (33.4 to NA)	0.6601 (0.5369 to 0.8116)	<0.001

**Figure S1.** Forest plots of HRs with 95%CI for PFS and OS of the six trials against pooled sunitinib controls



**Figure S2.** Visual representation of indirect treatment comparisons for PFS. All head-to-head comparisons are represented in form A vs. B, where treatment A is in the first column on the left and treatment B is in the second column, and so on. Green: A is superior to B; Red: A is inferior to B; Light Blue: no significant difference between A and B.

↓ vs. →	atezolizumab+ bevacizumab	avelumab+ axitinib	nivolumab+ ipilimumab	pembrolizumab + lenvatinib	nivolumab+ cabozantinib	pembrolizumab + axitinib
atezolizumab+ bevacizumab						
avelumab+ axitinib						
nivolumab+ ipilimumab						
Pembrolizumab + lenvatinib						
nivolumab+ cabozantinib						
pembrolizumab + axitinib						

**Figure S3.** Visual representation of indirect treatment comparisons for OS. All head-to-head comparisons are represented in the form of A vs. B, where treatment A is in the first column on the left and treatment B is in the second column, and so on. Green: A is superior to B; Red: A is inferior to B; Light Blue: no significant difference between A and B.

↓ vs. →	atezolizumab+ bevacizumab	avelumab+ axitinib	nivolumab+ ipilimumab	pembrolizumab + lenvatinib	nivolumab+ cabozantinib	pembrolizumab + axitinib
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