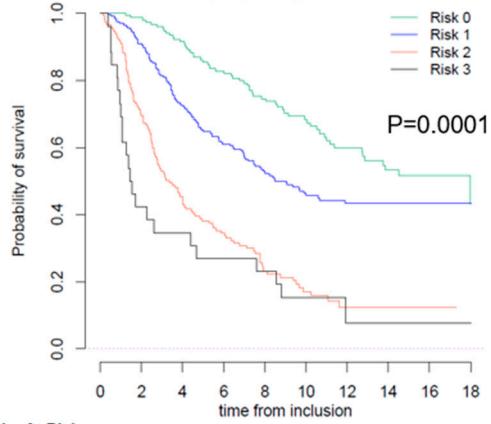
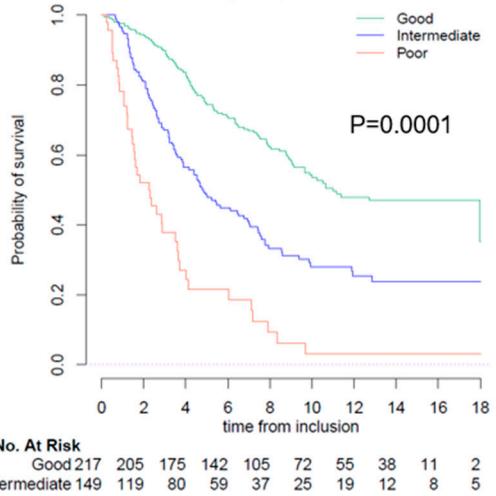


### Supplementary Figure S1 : OS to LIPI and Bellmunt score in different subgroup

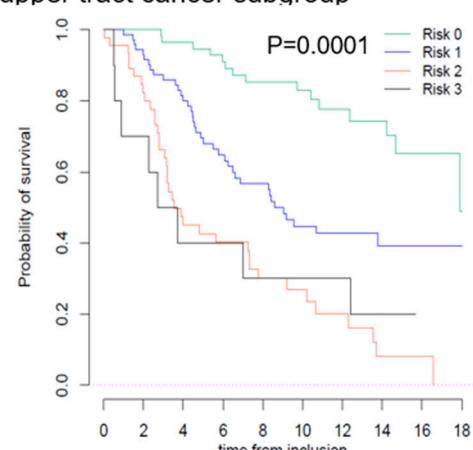
A OS according to Bellmunt score in bladder cancer subgroup



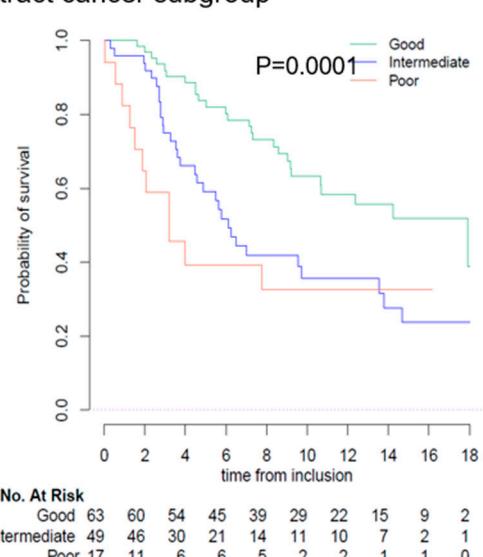
B OS according to LIPI score in bladder cancer subgroup



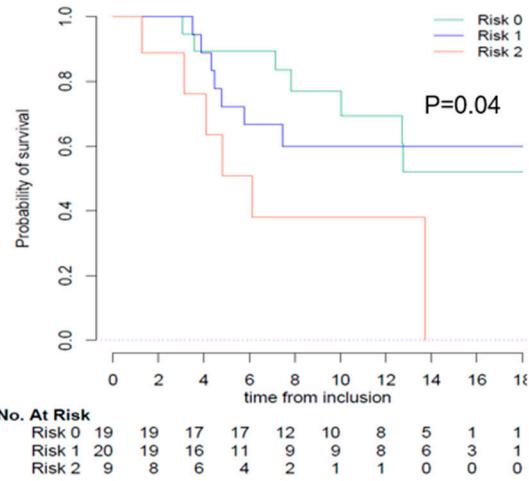
C OS according to Bellmunt score in upper tract cancer subgroup



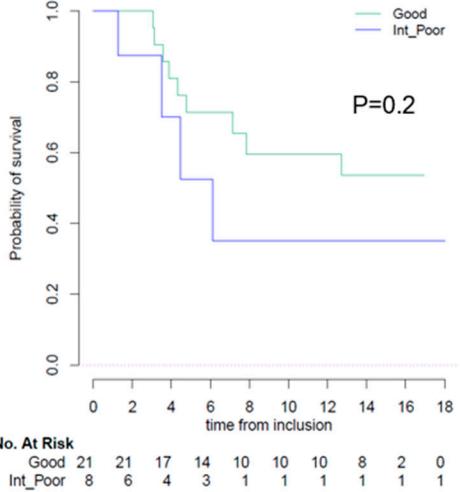
D OS according to LIPI score in upper tract cancer subgroup



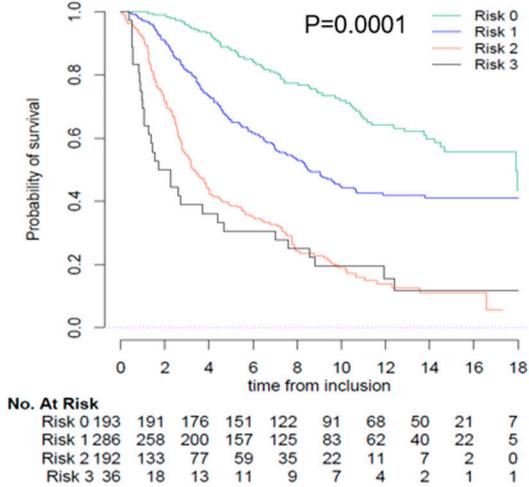
E OS according to Bellmunt score in locally advanced cancer subgroup



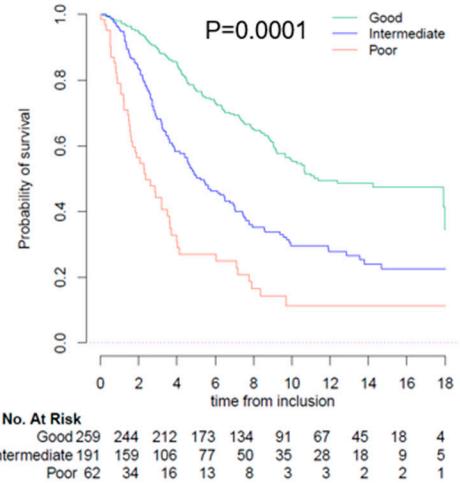
F OS according to LIPI score in locally advanced cancer subgroup



G OS according to Bellmunt score in metastatic cancer subgroup



H OS according to LIPI score in upper tract cancer subgroup



**Supplementary Table S1:** ICI and SAUL cohort characteristics according to LIPI group

Hemoglobin (g/dL)	12.6 (11.4;13. 4)	10.9 (10.1;12.7)	10.8 (9.6;12.2)	<0.001	12.2 (11;13.3)	11.2 (10.2;12.5)	10.3 (9.6;11.1)	<0.001
Leucocytes (Giga/L)	7.4 (6.0; 9.7)	7.5 (5.8;9.5)	6.8 (5.5;8.6)	0.917	6.5 (5.3; 8.1)	8.0 (6.1;10.6)	10 (8.4;13.5)	0.677
ANC (Giga/L)	4.1 (3.2;5.2)	5.6 (4.4;8.2)	8.8 (5.2;11.8)	<0.001	4.2 (3.3;5.4)	5.8 (4.2;8.2)	8.6 (6.7;10.7)	<0.001
Albumin (g/L)	42 (38.5;44 )	39 (36.5;41)	38 (31.5;39.8)	0.002	40 (37;43)	38 (34;41)	34 (31;37)	
<b>LDH &gt; ULN (n,%)</b>	0 (0)	21 (44)	12 (100)	<0.001	0 (0)	106 (54)	63 (100)	<0.001
<b>dNLR &gt;3 (n,%)</b>	0 (0)	27 (56)	12 (100)	<0.001	<0.001	92 (46)	63 (100)	<0.001
<b>Radiological response</b>								
Complete response	14 (18)	3 (6)	0 (0)	--	11 (4)	2 (1)	1 (2)	--
Partial response	16 (21)	10 (21)	1 (8)		31 (11)	13 (7)	4 (6)	
Stable disease	18 (23)	7 (15)	1 (8)		115 (41)	54 (27)	6 (9)	
Progressive disease	29 (38)	27 (56)	10 (84)		82 (29)	64 (32)	15 (24)	
Not evaluable	0 (0)	1 (2)	0 (0)		41 (15)	65 (33)	37 (59)	
<b>Progression-free survival (mo) (median, range)</b>	5.8 (3.4;17.7 )	2.9 (1.7;9.2)	1.3 (1-NR)	<0.000 1	4.0 (3.1;4.5)	2.2 (2.1;2.4)	1.7 (1.4;2.0)	<0.000 1
<b>Overall survival (mo) (median, range)</b>	19.7 (13.0;40. 7)	13.7 (6.9;25.8)	5.4 (2.5;NR)	0.002	12.4 (10.0;NR)	5.4 (4.5;6.9)	2.4 (1.6;3.7)	<0.000 1

LIPPI : lung immune prognosis index

**Supplementary Table S2:** Univariate Analysis for OS and PFS in the ICI and SAUL cohorts;  
Univariate analysis for OS in the Chemo cohort

	ICI cohort		SAUL cohort		Chemo cohort
Variables	HR (95% CI) OS	HR (95% CI) PFS	HR (95% CI) OS	HR (95% CI) PFS	HR (95% CI) OS
<b>Age at diagnosis (yrs)</b>					
≤ 65	1 [reference]	1 [reference]	1 [reference]	1 [reference]	1 [reference]
> 65	1.10 (0.76;1.60)	1.32 (0.86;2.03)	0.90 (0.80;1.03)	0.93 (0.78;1.10)	1.20 (0.75;1.94)
P value	0.62	0.20	0.12	0.37	0.45
<b>Gender</b>					
Female	1 [reference]	1 [reference]	1 [reference]	1 [reference]	1 [reference]
Male	0.49 (0.32;0.75)	0.67 (0.41;1.10)	0.96 (0.83;1.12)	0.91 (0.75;1.10)	1.59 (0.87;2.93)
P value	0.001	0.11	0.62	0.35	0.14
<b>Metastatic site</b>					
<b>Liver</b>					
No	1 [reference]	1 [reference]	1 [reference]	1 [reference]	1 [reference]
Yes	1.42 (0.93;2.18)	1.96 (1.23;3.111)	1.80 (1.57;2.06)	2.21 (1.86;2.61)	0.95 (0.56;1.62)
P value	0.105	0.005	<0.0001	<0.0001	0.86
<b>Central nervous system</b>					
No	1 [reference]	1 [reference]	1 [reference]	1 [reference]	1 [reference]
Yes	2.76 (1.12;6.81)	1.20 (0.36;3.81)	2.12 (1.25;3.60)	2.72 (1.25;4.13)	0.60 (0.15;2.47)
P value	0.028	0.007	0.005	0.007	0.86
<b>Pretreatment Performance Status (ECOG)</b>					
0 to 1	1 [reference]	1 [reference]	1 [reference]	1 [reference]	1 [reference]
≥2	1.68 (1.30;2.18)	3.91 (2.43;6.29)	2.70 (2.19;3.34)	3.99 (3.16;5.03)	2.21 (1.35;3.61)
P value	<0.0001	<0.0001	<0.0001	<0.0001	0.002
<b>Pretreatment circulating inflammatory markers</b>					
<b>Albumin</b>					
≤ 35g/L	1 [reference]	1 [reference]	1 [reference]	1 [reference]	1 [reference]
> 35g/L	0.62 (0.39;0.98)	0.56 (0.34;0.91)	0.67 (0.58;0.82)	0.42 (0.34;0.51)	0.37 (0.22;0.63)
P value	0.04	0.02	<0.0001	<0.0001	<0.0001
<b>Hemoglobin</b>					
≤ 10g/dL	1 [reference]	1 [reference]	1 [reference]	1 [reference]	1 [reference]
> 10 g/dL	0.58 (0.37;0.97)	0.43 (0.26;0.71)	0.58 (0.48;0.71)	0.40 (0.32;0.51)	0.82 (0.72;0.94)
P value	0.036	0.001	<0.0001	<0.0001	0.003
<b>Pretreatment LIPI</b>					
Good	1 [reference]	1 [reference]	1 [reference]	1 [reference]	1 [reference]
Intermediate	1.56 (1.03;2.34)	1.55 (0.97;2.49)	1.44 (1.19;1.73)	2.13 (1.67;2.72)	1.97 (1.12;3.48)
Poor	3.86 (2.04;7.29)	3.08 (1.56;6.06)	2.27 (1.72;3.00)	4.51 (3.24;6.27)	3.78 (1.53;9.97)
P value	0.0005	0.007	<0.0001	<0.0001	0.001

OS: Overall survival, PFS: progression-free survival, LIPI: lung immune prognosis index

**Supplementary Table S3:** Cross-tabulation analysis of patient number according to the Bellmunt and LIPI scores in the SAUL cohort

LIPI factors (No)	0	1	2
Bellmunt factors (No)			
0	102	43	2
1	125	79	20
2	49	63	28
3	3	13	13



Patients with good prognosis when LIPI and Bellmunt scores were combined



Patient with poor prognosis when LIPI and Bellmunt scores were combined