

Additional file 1 for

Noninvasive urinary protein signatures combined clinical information associated with

Microvascular Invasion Risk in HCC patients

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**This PDF file includes:**

Figures S1 to S4

Table S1

**Figure S1**

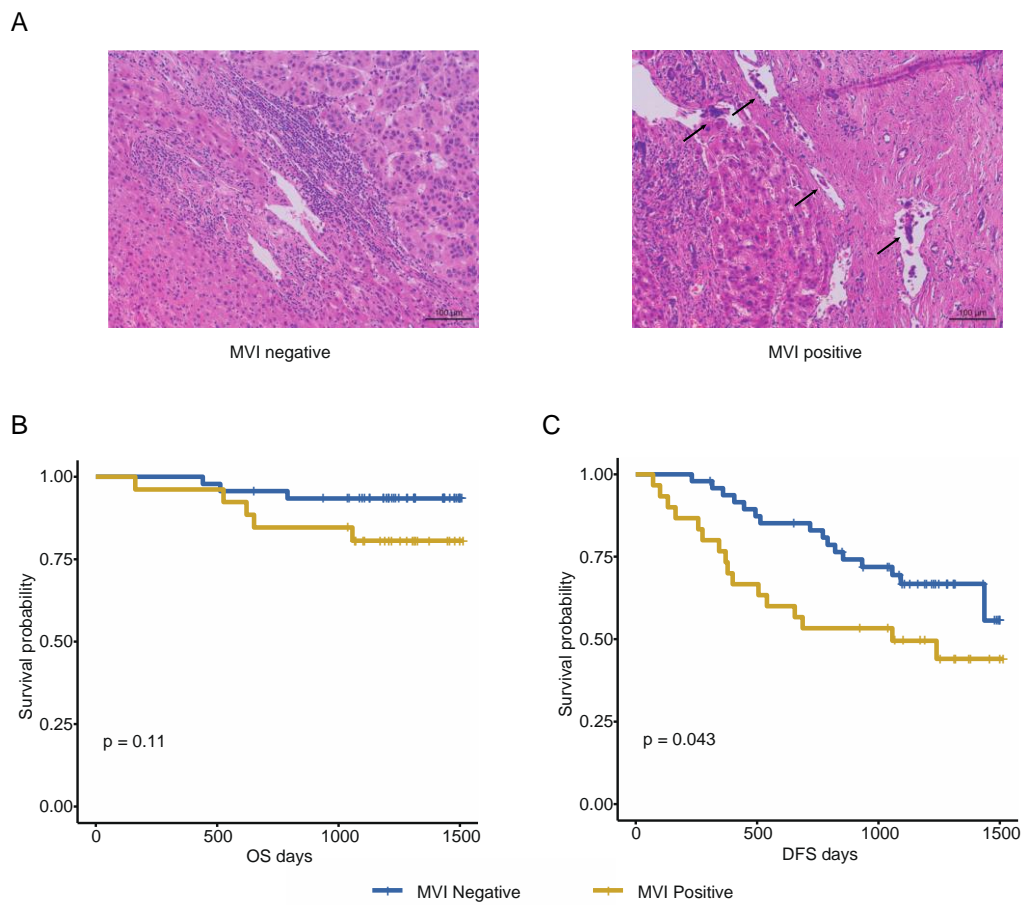


Figure S1. Pathological and prognostic characteristics of HCC patients with different MVI status. A, H&E staining images of representative HCC patients with different MVI states. MVIs has been marked in the figure with arrows. B, C, Kaplan-Meier plots of OS/DFS times for patients with HCC stratified by MVI.

**Figure S2**

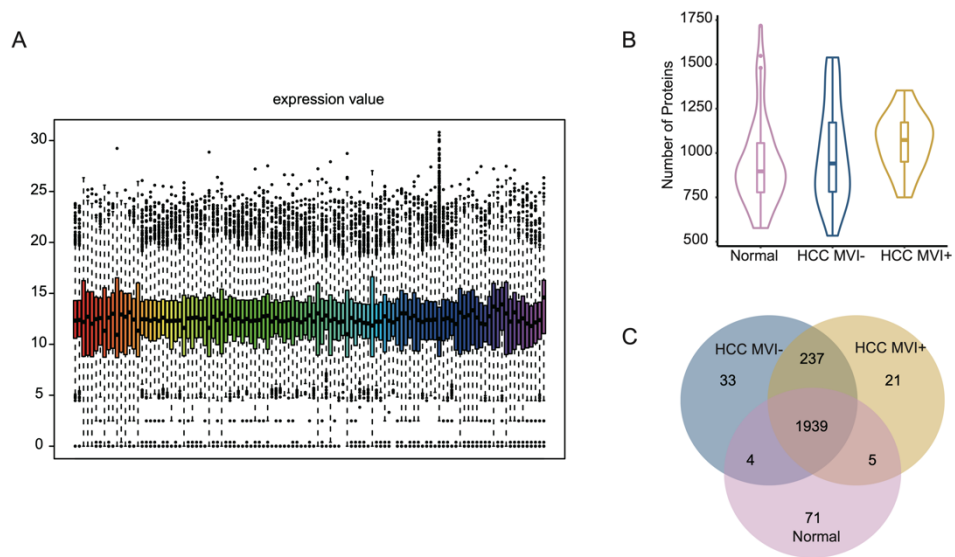


Figure S2. An Overview of urinary proteome identified proteins. A, Protein expression levels identified by urinary proteomics. B, The number of proteins identified in three sets of samples. C, Venn diagram summary of the number of proteins identified by urinary proteomics.

Figure S3

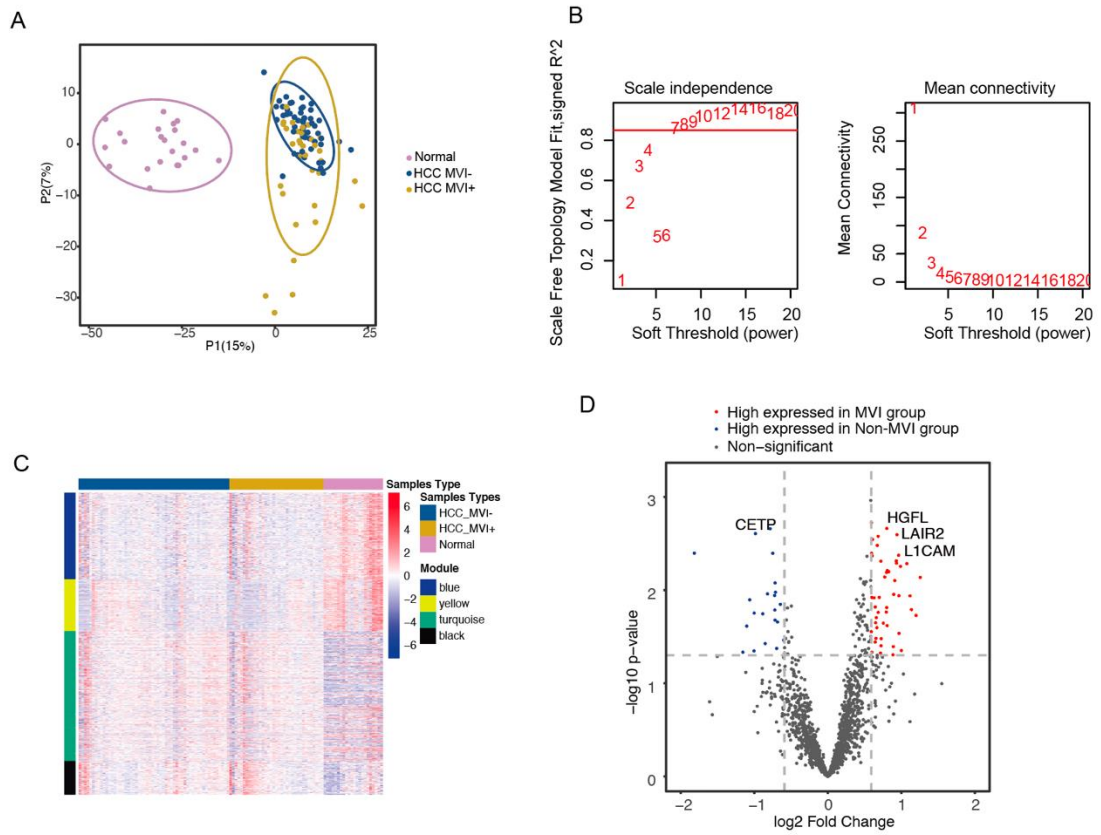


Figure S3. Proteomics Features of three groups. A, Principal component analysis (PCA) of urinary proteomic data. B, WGCNA performs soft threshold screening. C, Protein expression levels of representative modules in three groups. D, Volcano plot of differential expressed proteins between MVI and non-MVI group.

**Figure S4**

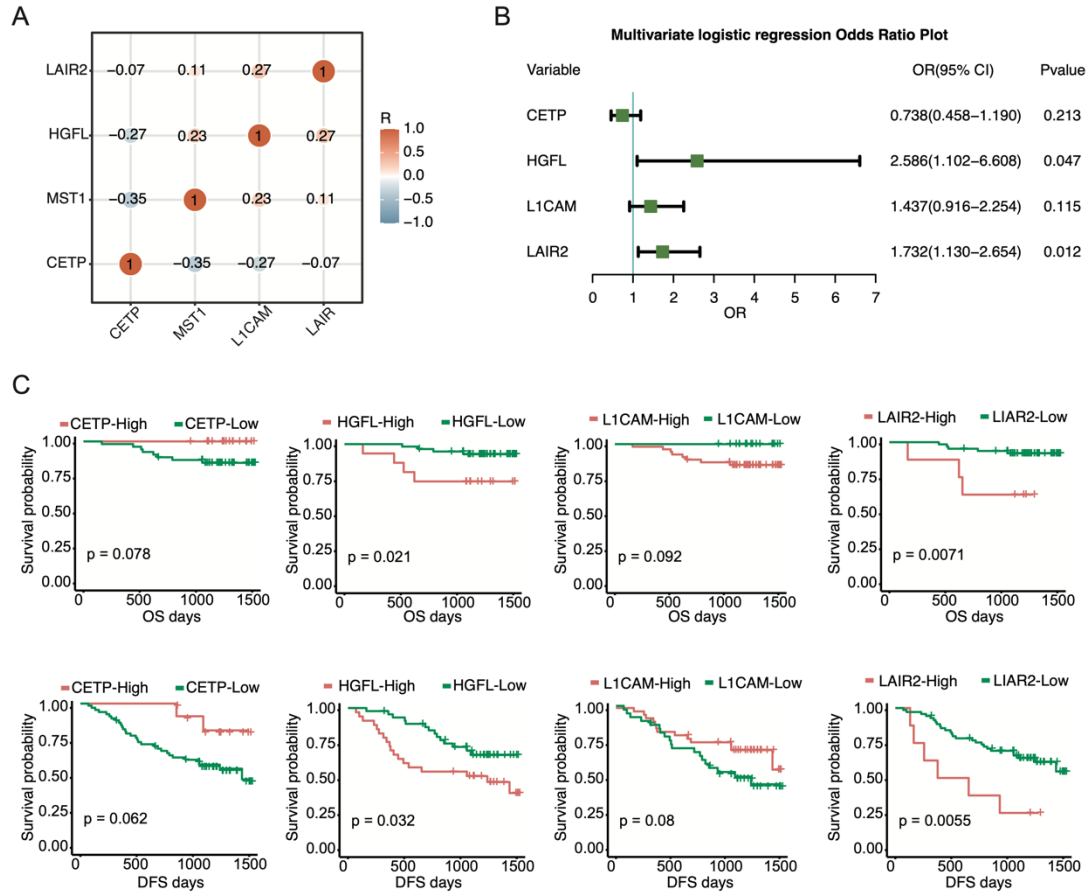


Figure S4, Expression levels and prognostic value of characteristic proteins. A, Correlation of characteristic protein expression. B, Forest plot of multivariate logistic regression of signature proteins. C, Prognostic value of expression levels of individual signature proteins.

**Table S1.** Characteristics of HCC patients analyzed by proteomics

Variable	Cohort, No. (%)		P Value
	Training (n = 68)	Testing (n = 23)	
<b>Sex</b>			0.731
Male	59 (86.8)	19 (82.6)	
Female	9 (13.2)	4 (17.4)	
<b>Age, mean (SD), y</b>	59.43 (9.89)	61.26 (11.77)	0.466
<b>Tumor number</b>			
Solitary	56(82.4)	22(95.7)	0.172
Multiple	12(17.6)	1(4.3)	
<b>Tumor diameter, mean (SD), cm</b>	4.51 (2.65)	4.62 (1.99)	0.858
<b>Tumor capsule</b>			0.676
Complete	36 (52.9)	14 (60.9)	
Incomplete	32 (47.1)	9 (39.1)	
<b>WBCs, 10<sup>9</sup>/L</b>			0.356
>10	5 (7.4)	4 (17.4)	
4-10	54 (79.4)	17 (73.9)	
<4	9 (13.2)	2 (8.7)	
<b>HGB, g/L</b>			0.893
>160	12 (17.6)	3 (13.0)	
120-160	53 (77.9)	19 (82.6)	
<120	3 (4.4)	1 (4.3)	
<b>NEUT, 10<sup>9</sup>/L</b>			0.46
>7.50	6 (8.8)	4 (17.4)	
2.04-7.50	54 (79.4)	16 (69.6)	
<2.04	8 (11.8)	3 (13.0)	
<b>MONO, 10<sup>9</sup>/L</b>			1
>0.80	4 (5.9)	1 (4.3)	
0.12-0.80	64 (94.1)	22 (95.7)	
<b>LYMPH, 10<sup>9</sup>/L</b>			0.108
0.80-4.00	64 (94.1)	19 (82.6)	
<0.80	4 (5.9)	4 (17.4)	
<b>PLT, 10<sup>9</sup>/L</b>			0.266
>300.0	2 (2.9)	0 (0.0)	
100.0-300.0	55 (80.9)	22 (95.7)	
<100.0	11 (16.2)	1 (4.3)	
<b>PT, S</b>			1
>13.2	14 (20.6)	4 (17.4)	
10.0-13.2	54 (79.4)	19 (82.6)	

<b>APTT, S</b>			0.368
>34.6	3 (4.4)	2 (8.7)	
20.9-34.6	60 (88.2)	21 (91.3)	
<20.9	5 (7.4)	0 (0.0)	
<b>D-D, mg/L FEU</b>			1
>0.55	18 (26.5)	6 (26.1)	
≤0.55	50 (73.5)	17 (73.9)	
<b>GLU, mmol/L</b>			0.405
>6.38	19 (27.9)	10 (43.5)	
3.89-6.38	48 (70.6)	13 (56.5)	
<3.89	1 (1.5)	0 (0.0)	
<b>CRE, umol/L</b>			0.536
>97	8 (11.8)	4 (17.4)	
57-97	54 (79.4)	16 (69.6)	
<57	6 (8.8)	3 (13.0)	
<b>ALB, g/L</b>			0.785
40.0-55.0	50 (73.5)	18 (78.3)	
<40.0	18 (26.5)	5 (21.7)	
<b>ALT, U/L</b>			0.524
>50.0	19 (27.9)	7 (30.4)	
9.0-50.0	48 (70.6)	15 (65.2)	
<9.0	1 (1.5)	1 (4.3)	
<b>AST, U/L</b>			1
>40.0	19 (27.9)	6 (26.1)	
15.0-40.0	47 (69.1)	17 (73.9)	
<15.0	2 (2.9)	0 (0.0)	
<b>GGT, U/L</b>			0.124
>60.0	23 (35.4)	4 (17.4)	
10.0-60.0	42 (64.6)	19 (82.6)	
<b>TBIL, umol/L</b>			0.442
>21	9 (13.2)	1 (4.3)	
2-21	59 (86.8)	22 (95.7)	
<b>DBIL, umol/L</b>			0.319
>5.1	45 (66.2)	12 (52.2)	
≤5.1	23 (33.8)	11 (47.8)	
<b>ALP, U/L</b>			0.859
>125.0	6 (8.8)	2 (8.7)	
45.0-125.0	59 (86.8)	21 (91.3)	
<45.0	3 (4.4)	0 (0.0)	
<b>CRP, mg/dl</b>			1
>0.6	9 (13.8)	3 (13.0)	
≤0.6	56 (86.2)	20 (87.0)	
<b>AFP, ng/mL</b>			0.47

>7.0	37 (54.4)	10 (43.5)	
≤7.0	31 (45.6)	13 (56.5)	
<b>CA199, U/mL</b>			0.052
>27.0	20 (29.4)	2 (8.7)	
≤27.0	48 (70.6)	21 (91.3)	
<b>CEA, ng/mL</b>			1
>5.0	11 (16.2)	3 (13.0)	
≤5.0	57 (83.8)	20 (87.0)	
<b>GGT, U/L</b>			0.124
>60.0	23 (35.4)	4 (17.4)	
10.0-60.0	42 (64.6)	19 (82.6)	
<b>HBsAg</b>			0.18
negative	14 (20.6)	9 (39.1)	
positive	51 (75.0)	14 (60.9)	
<b>HBsAb</b>			0.709
negative	51 (75.0)	19 (82.6)	
positive	14 (20.6)	4 (17.4)	
<b>HBeAg</b>			0.531
negative	51 (75.0)	20 (87.0)	
positive	14 (20.6)	3 (13.0)	
<b>HCV.Ab</b>			0.687
negative	62 (91.2)	20 (87.0)	
positive	6 (8.8)	3 (13.0)	

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