







**Supplementary figure 3.** Prioritization of neighbouring genes in protein–protein interaction network was analysed by Toppgene (B, [http://toppgene.cchmc.org/ToppGene/network\\_prioritization.jsp](http://toppgene.cchmc.org/ToppGene/network_prioritization.jsp)).

**Supplementary table 1.** Clinical and pathological data of patients

No.	Age	Sex	HBsAg	Anti-HCV	AFP(ng/ml)	Tumour size (cm)	Grade	Cirrhosis
1	43	M	+	-	767.9	7×9	2-3	-
2	63	M	+	-	<20	7×6	3-4	+
3	66	M	-	-	324.6	8×5	3-4	+
4	38	M	+	-	13625	9×8	2-3	-
5	55	M	+	-	<20	8×10	3-4	+
6	60	F	+	-	336	4×2	1-2	+
7	55	F	+	-	484000	13×9	2	-
8	53	F	-	+	2015	8×5	2-3	+
9	60	F	+	-	1592	6×4	2-3	-
10	36	M	+	-	3129	3×2.5	1-2	-

M, male; F, female; AFP, R-fetoprotein; HBsAg, hepatitis B surface antigen; Anti-HCV, antibody for hepatitis C virus.

**Supplementary table 2.** Clinical characteristics of HCC samples used in the validation study

Age (mean)	Sex(male/female)	Serum AFP≤20/>20(ng/ml)	HBV <sup>+</sup> /HCV <sup>+</sup> /HBV <sup>-</sup> /HCV <sup>-</sup>	Clinical stage I/II/III/IV <sup>a</sup>
36-68 (48.6)	66/34	18/82	78/10/12	6/38/44/12

<sup>a</sup> Assessment based on TNM classification by the international union against cancer.