

**Supplementary Table 3.** Clinical information of the patients in the validation datasets

Variables	VD1 (PRJNA739257)		VD2 (PRJNA909469)		VD3 (PRJNA717231)	
	Normal	HCC	Normal	HCC	Normal	HCC
Sample	17	17	3	3	4	8
Sex						
Male		11	3	3	2	6
Female		6	0	0	2	2
Age		53±19	47±6	62±21	29±4	64±4
Etiology		HBV		HBV		HBV
BCLC						
Stage A		6		0		4
Stage B		1		0		4
Stage C		4		0		0
Stage D		5		3		0
Cirrhosis		9				
Metastasis		9				
Race			Asian	Asian		
Patient source	Shenzhen Traditional Chinese Medicine Hospital		Shenzhen Traditional Chinese Medicine Hospital		King Chulalongkorn Memorial Hospital, Thailand	
Sample type	PBMC		PBMC		PBMC	
Sample isolation	1. PB 2 mL collection (EDTA blood) 2. PBMCs separation (Ficoll-Paque PREMIUM) 3. RNA extraction (TRIzol)		1. PB 8 mL collection EDTA anti-coagulant vacuum angiography) 2. PBMCs isolation (density gradient centrifugation) 3. RNA extraction (TRIzol)		1. PB 6 mL collection (EDTA blood) 2. PBMCs isolation (Percoll PLUS density gradient media) 3. RNA extraction (TRIzol)	
Data type	Bulk RNA-seq		Bulk RNA-seq		Bulk RNA-seq	

Values are presented as number only or mean±standard deviation.

VD, validation dataset; HCC, hepatocellular carcinoma; HBV, hepatitis B virus; PBMC, peripheral blood mononuclear cell; PB, peripheral blood.