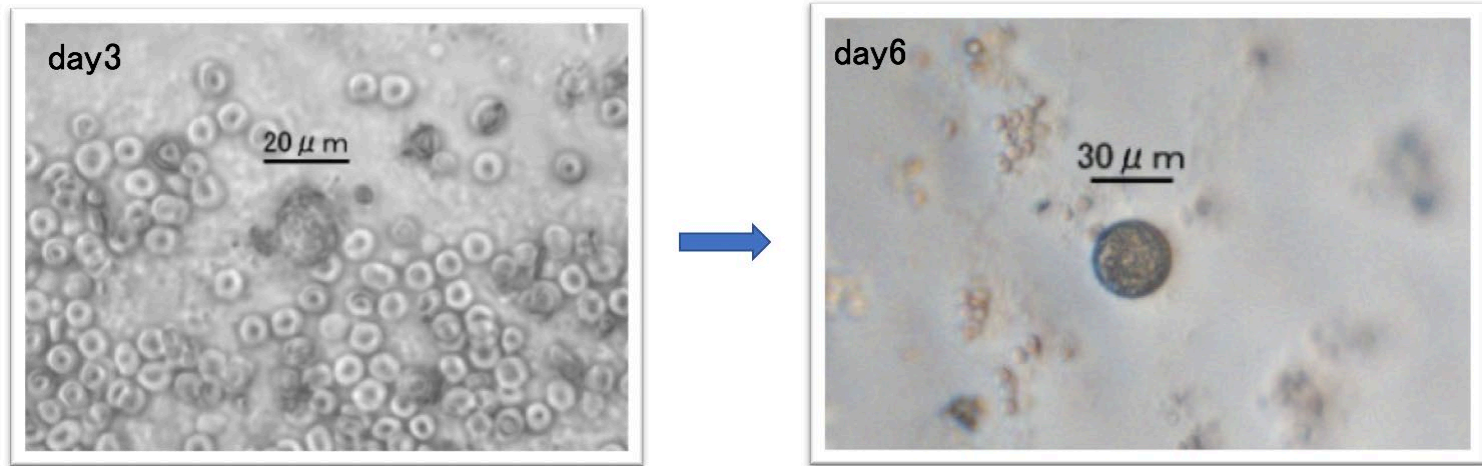
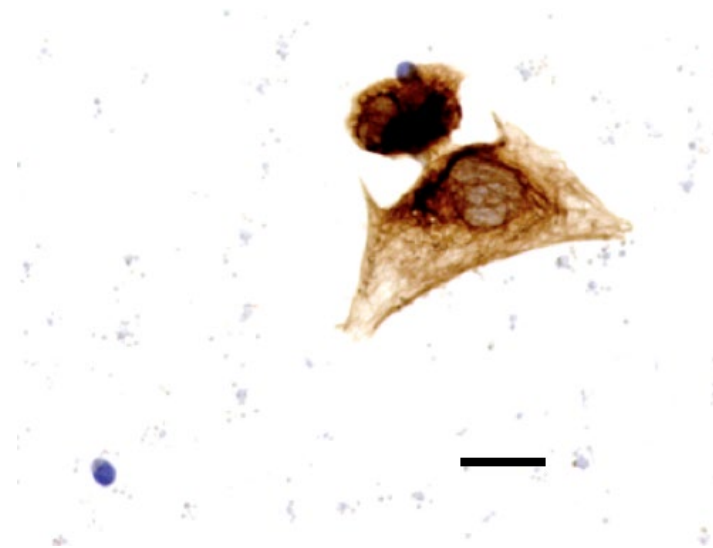


**Fig. S1. Scheme of CTC collection and analysis.** OncoQuick tube and PMEAFN were used for enrichment of CTCs. Cells were incubated overnight on the PMEAFN-coated slides. The next day, more than half fraction was transferred to Matrigel-coated plates. The remaining cells were subject to immunostaining for EpCAM. FN: fibronectin.

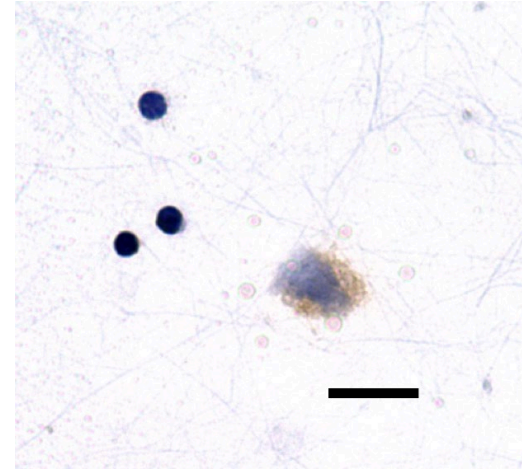


**Fig. S2. Culture of CTC in Case #33.** A spheroid-like structure grew up from day 3 to day 6 while many red blood cells and some leukocytes disappeared during the period.

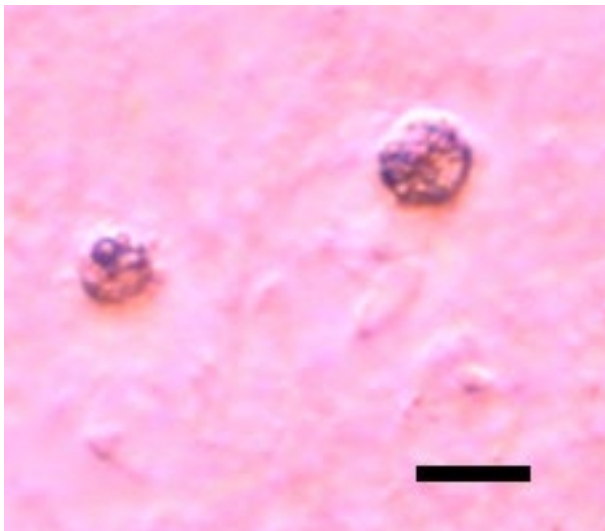
A



B



C



**Fig. S3. Examples of captured CTCs of hepatocellular carcinoma by PME A coating.**

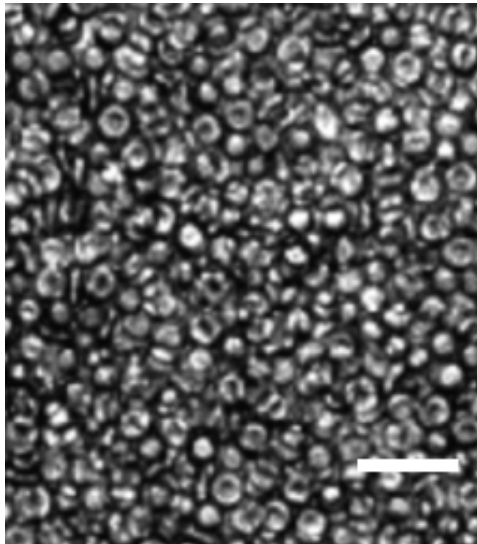
(A) Spike test using Huh7 cell line.

(B) CTC from peripheral blood sample of a HCC patient.

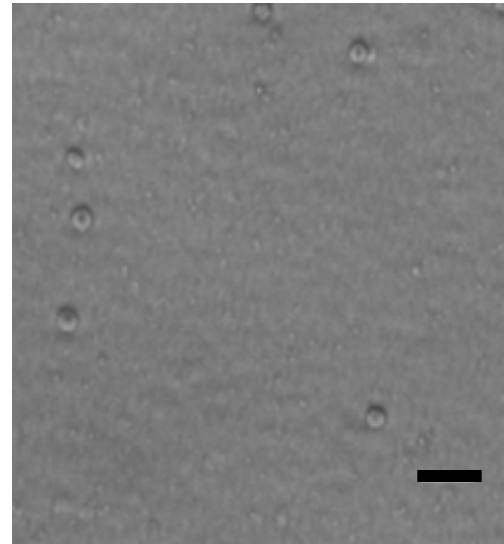
Immunostaining was performed with anti- CK8/CK18 cocktail antibody.

(C) Spheroid-like structures appeared on day 5. Scale bars: 20  $\mu$ m.

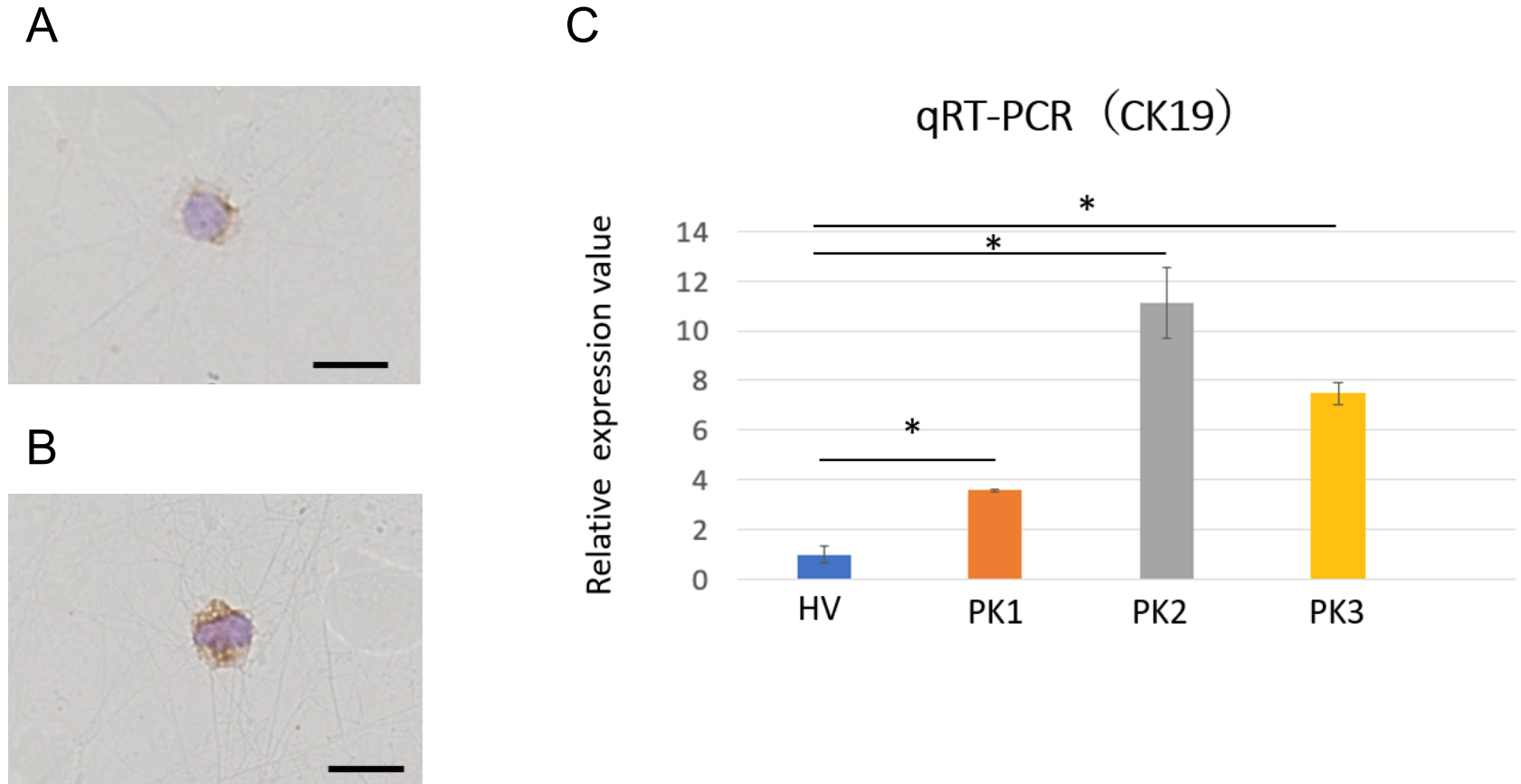
day 2



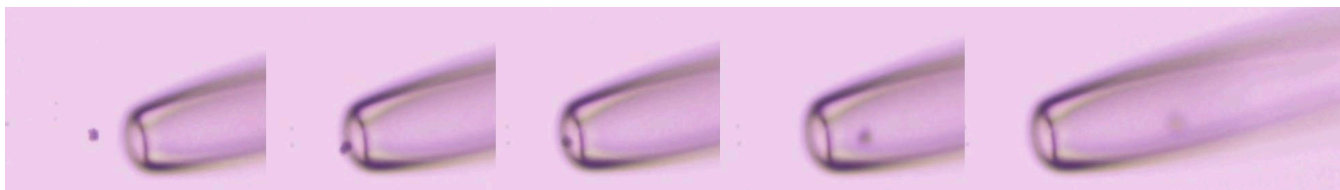
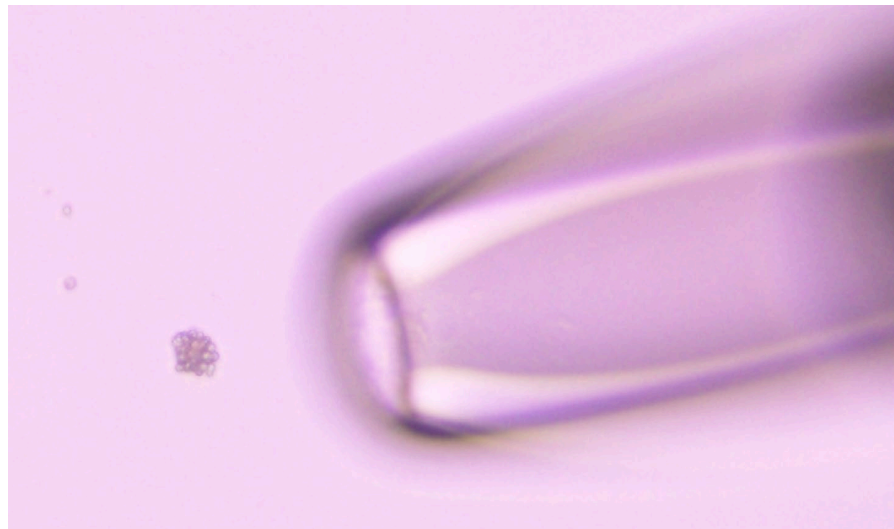
day 6



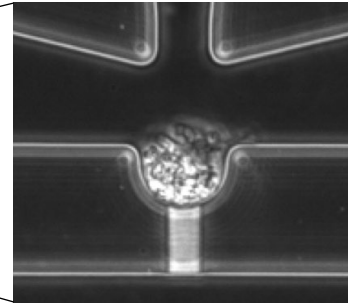
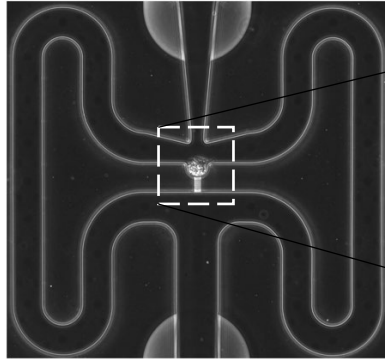
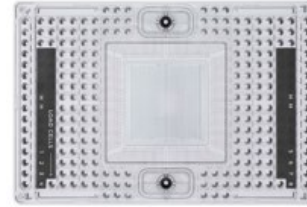
**Fig. S4. A direct culture after concentration with the OncoQuick tube.** Numerous red blood cells and leukocytes occupied a chamber slide on day 2. On day 6, cells mostly disappeared.



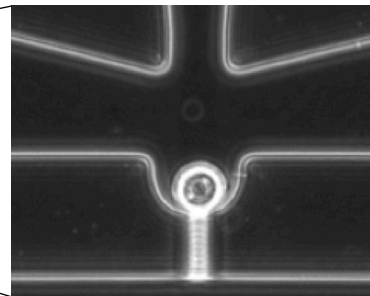
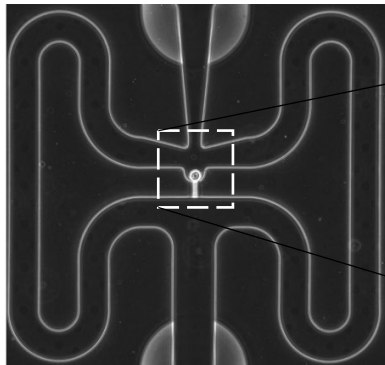
**Fig. S5. Examples of captured CTCs of pancreatic carcinoma by PMEA coating.**  
(A) A CTC from portal vein blood sample of a pancreatic cancer patient.  
(B) A CTC from portal vein blood sample of another pancreatic cancer patient.  
Immunostaining was performed with anti-CK19 antibody. Scale bars: 20  $\mu$ m.  
(C) qRT-PCR for CK19 mRNA expression. Cultured cells from three patients (PK1, PK2, PK3) were collected on day7. Blood sample from a healthy volunteer (HV) served as negative control. \* $P < 0.05$ .



**Fig. S6. The electrically-powered micromanipulator can pick up a cluster of tumor cells.**



CTC culture  
on day 7



RBC

**Fig. S7. Comprehensive gene expression analysis using C1™ single cell Auto Prep System (Fluidigm).** A spheroid derived from CTC of a pancreatic cancer patient was captured in a cell deposit space on day 7. A red blood cell (8  $\mu\text{m}$  in diameter) was also captured.

Table S1. Recovery rate of CRC cells from blood sample

HT29

Initial cell number/10 $\mu$ L	After OncoQuick concentration		ICC (+)	Recovery rate
148	132 (89.2%)	Sample 1	98	74.2% (98/148)
		Sample 2	103	78.0% (103/148)

DLD-1

Initial cell number/10 $\mu$ L	After OncoQuick concentration		ICC (+)	Recovery rate
121	110 (90.9%)	Sample 1	87	79.1% (87/121)
		Sample 2	83	75.5% (83/121)

ICC: Immunocytochemistry



Table S2. Relationship between detection of circulating tumor cells and clinicopathological parameters

	N = 41	CTC (+), N = 18	CTC (-), N = 23	P value
Age: years; median (range)	67 (25-80)	68.5 (40-80)	67 (25-80)	0.73
Sex: Male /Female	26/15	13/5	13/10	0.30
CEA ng/mL; median (range))	30 (2-2739)	13.75 (2-2739)	50 (2-1956)	0.89
CA19-9 U/mL; median (range))	26.2 (0.4-4349.5)	17.5 (0.4-2870.2)	36 (0.4-4339.5)	0.61
Location: Right / Left	8/33	4/14	4/19	0.70
*Differentiation : tub / muc, por	31/3	12/3	19/0	0.02
Primary tumor resection : yes / no	30/11	12/6	18/5	0.41
Chemotherapy or radiation : yes /no	11/30	3/15	8/15	0.19

\* tub: tubular adenocarcinoma, muc: mucinous carcinoma,  
por: poorly differentiated adenocarcinoma

**Table S3. Relationship between presence of growing tumor cells in cell culture and clinicopathological parameters**

	<b>N = 33</b>	<b>Culture (+) N = 18</b>	<b>Culture (-) N = 15</b>	<b>P value</b>
Age: years; median (range)	70 (25-80)	70 (25-80)	69 (43-80)	0.52
Sex: Male / Female	20/13	12/6	8/7	0.44
CEA ng/mL; median (range))	30 (2-2739)	23.55 (2-1956)	30 (2-2739)	0.96
CA19-9 U/mL; median (range))	26.2 (0.4-4349.5)	22.6 (0.4-1691.8)	28.6 (0.4-4339.5)	0.43
Location: Right / Left	8/25	3/15	5/10	0.27
*Differentiation : tub / muc, por	26/2	15/2	11/0	0.15
Primary tumor resection : yes / no	25/8	14/4	11/4	0.77
Chemotherapy or radiation : yes / no	10/23	1/17	9/6	0.0004

\* tub: tubular adenocarcinoma, muc: mucinous carcinoma,  
por: poorly differentiated adenocarcinoma