

Cell-Surface Vimentin (CSV) Monoclonal Antibody

Scientific Significance

The current drawback of capturing circulating tumor cells (CTCs) by the recognition of epithelial-specific markers, including EpCAM and cytokeratins, is the lack of ability to detect CTCs that undergo epithelial-mesenchymal transition (EMT) and no longer over-express EpCAM. Emerging as an universal marker for CTCs, EMT and cancer stem cells (CSCs), cell-surface vimentin (CSV), only found in CTCs, having strong association with invasive, chemoresistant and metastatic cancer cells has made it a propitious target for EMT CTCs and CSCs captivity.

Cell line	CSV	Cell line	CSV	Cell line	CSV
Breast		Colon		Brain	
MCF 7 (H)	+	DLD-1 (H)	++	SKNAS (H)	++
SKBR3 (H)	+	GEO (H)	++	SKNBE2 (H)	+++
MDA-MB-231 (H)	+	OS-187 (H)	++	NGP (H)	+
MDA-MB-453 (H)	+	SW620 (H)	+	SH-SY5Y (H)	++
MDA-MB-458 (H)	++	SW480 (H)	+	LAN5 (H)	++
4T1 (M)	+	HCT-116 (H)	+	KCN (H)	+
Liver					
AMC14 (M)	++	HT-29 (H)	++	DBT (M)	+
Bladder		Pancreas			
RT4V6 (H)	+	PANC-1 (H)	++	U251 (H)	+
T24 (H)	++	MiaPACA-2 (H)	+		

Table 1. Cell-surface vimentin expression in different cancer cell lines.¹

Universal CTC, EMT and CSC Monoclonal Antibody

Anti-human CSV monoclonal antibody (clone 84-1)

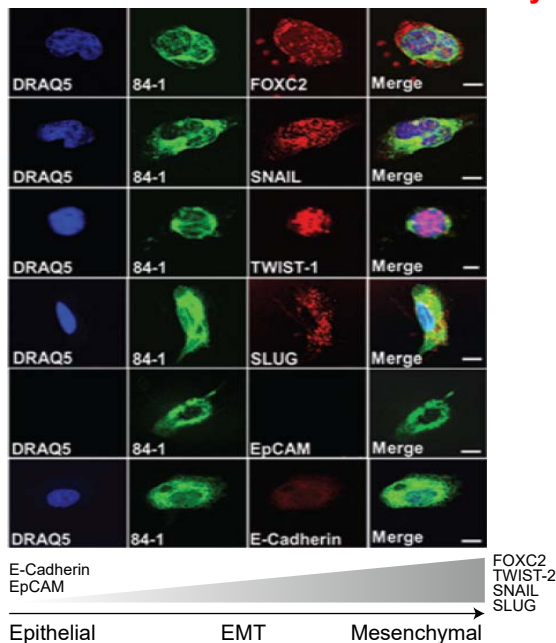


Figure 2. Analysis of colon cancer derived CSV⁺ CD45⁻ CTCs from patient samples stained with EMT marker specific antibodies and anti-CSV monoclonal antibody, clone 84-1.¹

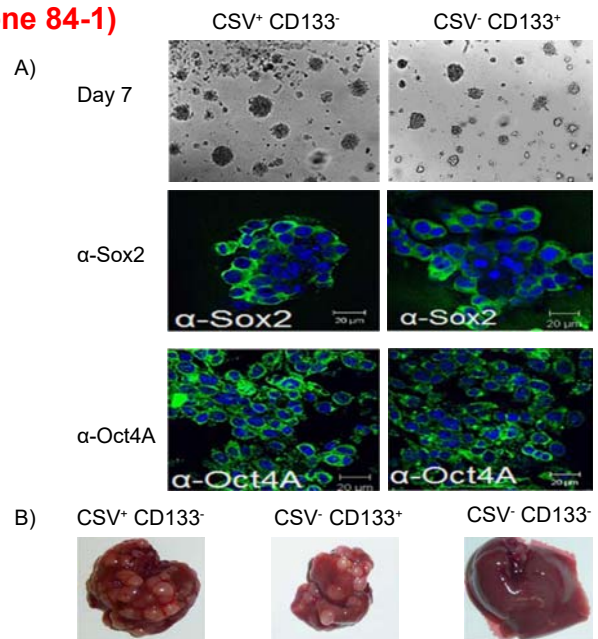


Figure 3. A) Matrigel sphere formation assay of CSV⁺ CD133⁻ and CSV⁻ CD133⁺ cells isolated from hepatocellular carcinoma (HCC) at Day 7. Both spheres were stained with stem cell associated markers, Sox2 and Oct4A. B) CSV⁺ CD133⁻ cells from HCC metastasize at a higher rate than CSV⁻ CD133⁺ and CSV⁻ CD133⁻ cells.²

Method	Sensitivity %	Specificity %	Positive Predictive Value %	Negative Predictive Value %
CSV	85	94.45	97.14	73.91
CellSearch	47.50	83.35	86.37	41.67
Average of 2 methods	82.50	94.45	97.06	70.84
Summation of 2 methods				
Cutoff 5 CTCs/7.5 mL	92.50	61.12	84.09	78.57
Cutoff 8 CTCs/7.5 mL	92.50	83.33	92.50	83.33
Ratio	55	72.23	81.49	41.94

Table 2. Analysis of sensitivity, specificity, positive predictive value, and negative predictive value of different CTC capturing methods.³

References:

1. Satelli A., et al., *Clinical Cancer Research* 2014; 21(4): 899-906.
2. Mitra A., et al., *International Journal of Cancer* 2015; 137: 491-496.
3. Satelli A., et al., *Clinical Chemistry* 2015; 61(1): 259-266.