

Figure S1.

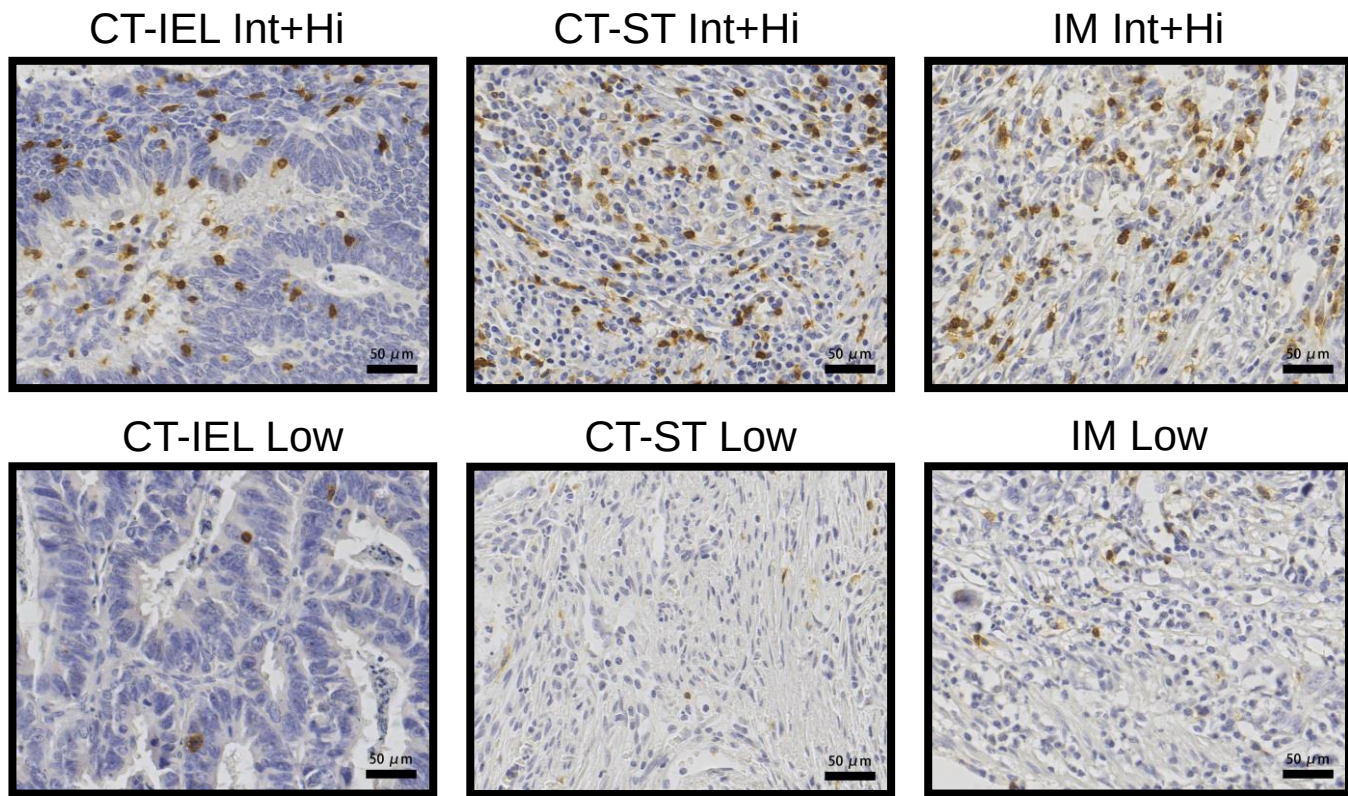


Fig S1 Representative images of CD103⁺ cell infiltration in CRC tissues

Figure S2

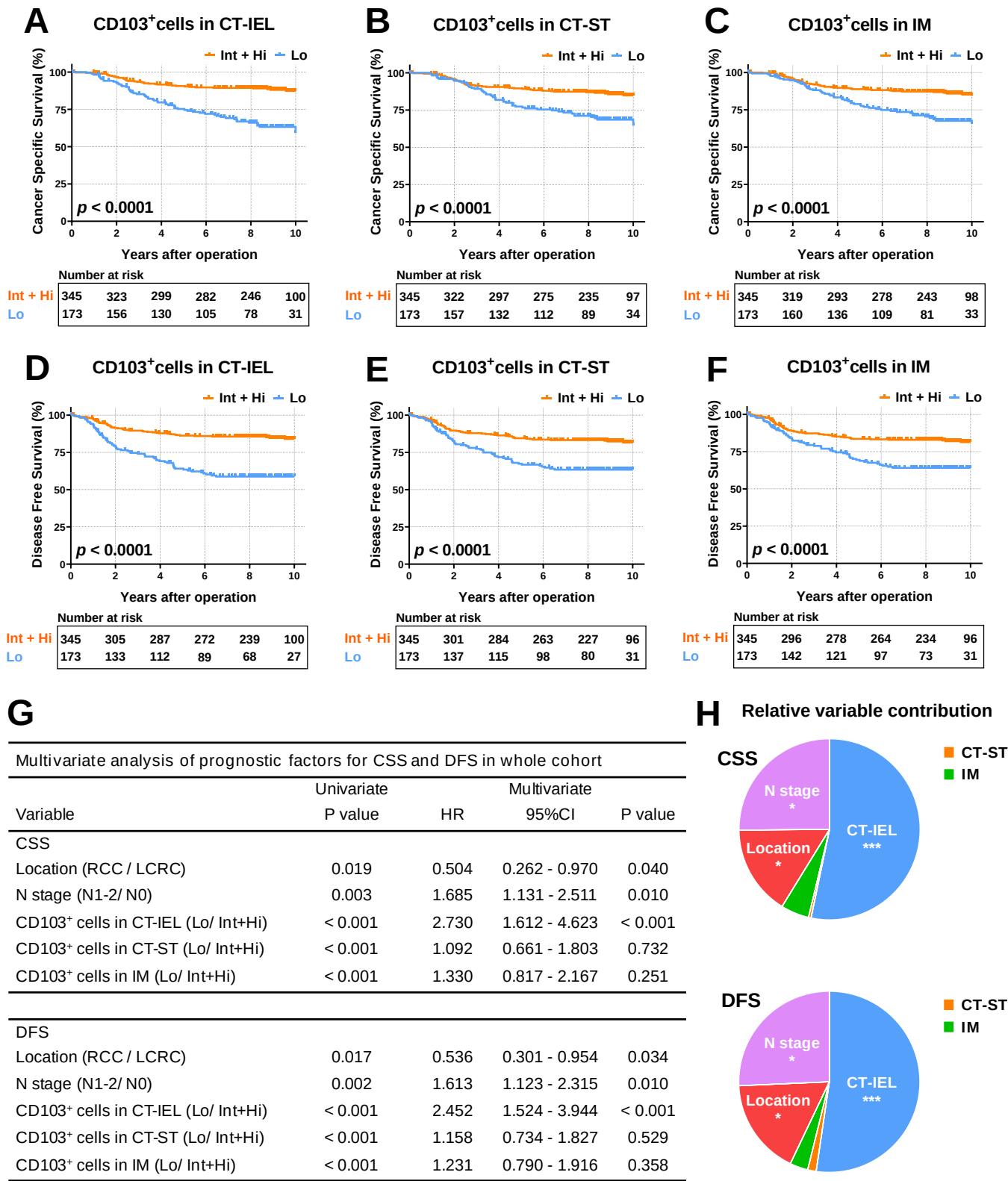


Fig S2 Prognostic value of CD103⁺ cell density in a whole cohort of CRC patients. The Kaplan-Meier survival analysis showed the probability of CSS and DFS, stratified according to the density of CD103⁺ cells within the compartments of CT-IEL (A, D), CT-ST (B, E), and IM (C, F). (G) Cox multivariable regression analysis of CSS and DFS encompassed CD103⁺ cells in CT-IEL, CT-ST and IM compartment, along with clinical parameters such as N stage and location. (H) The relative contribution of each parameter to survival risk for CSS and DFS was assessed using a chi-squared proportion test. * p<0.05, ** p<0.01, *** p<0.001.

Figure S3

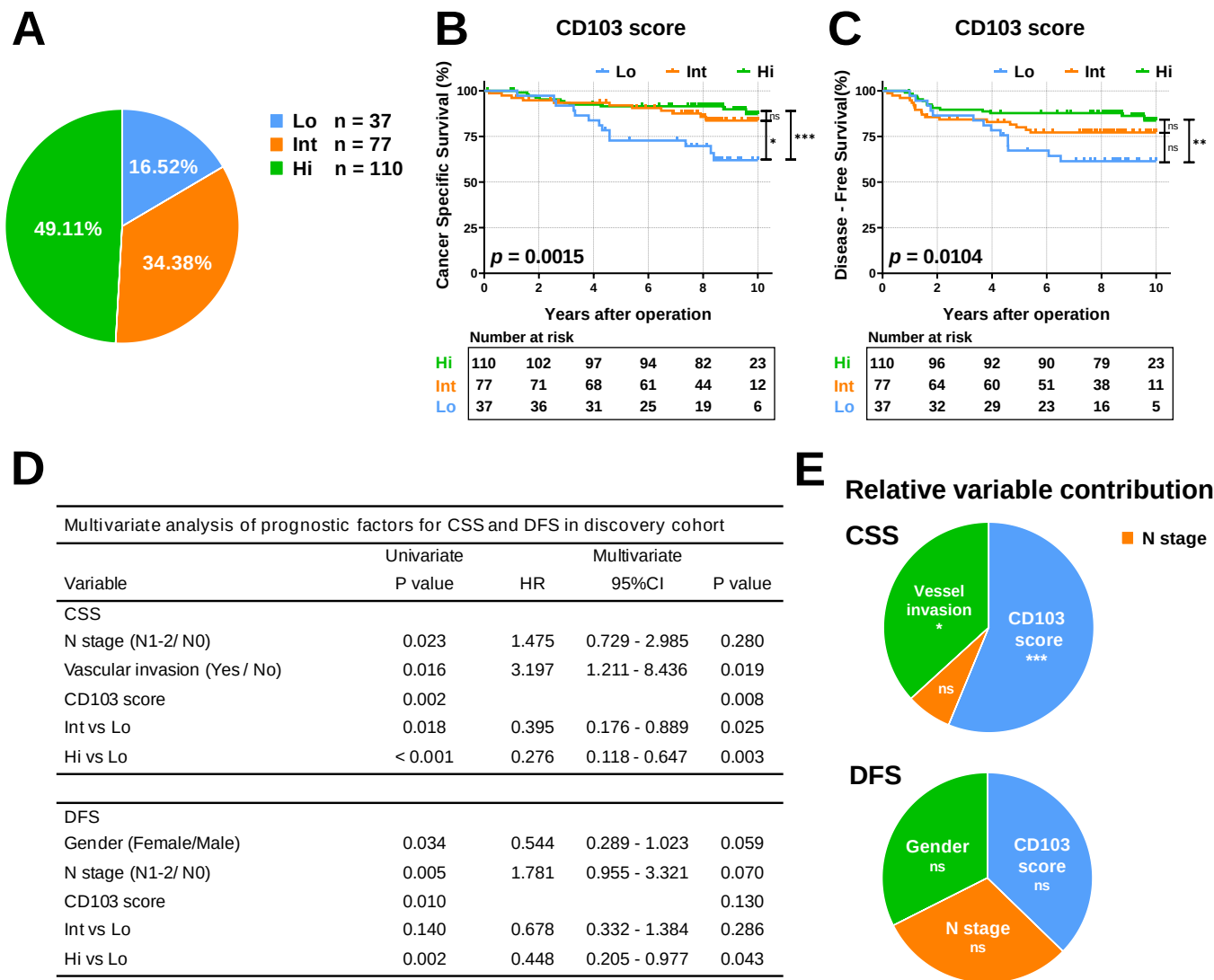


Fig S3 The impact of CD103 score on the outcome of discovery cohort of CRC patients. (A) The pie charts illustrated the proportion of the three CD103 score groups within discovery cohort. (B, C) The Kaplan-Meier survival analysis showed the probability of CSS and DFS stratified by CD103 score. (D) Cox multivariable regression analysis of CSS and DFS included CD103 score, gender, N stage and vascular invasion. (E) The relative contribution of each parameter to survival risk for CSS and DFS was assessed using a chi-squared proportion test. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Figure S4

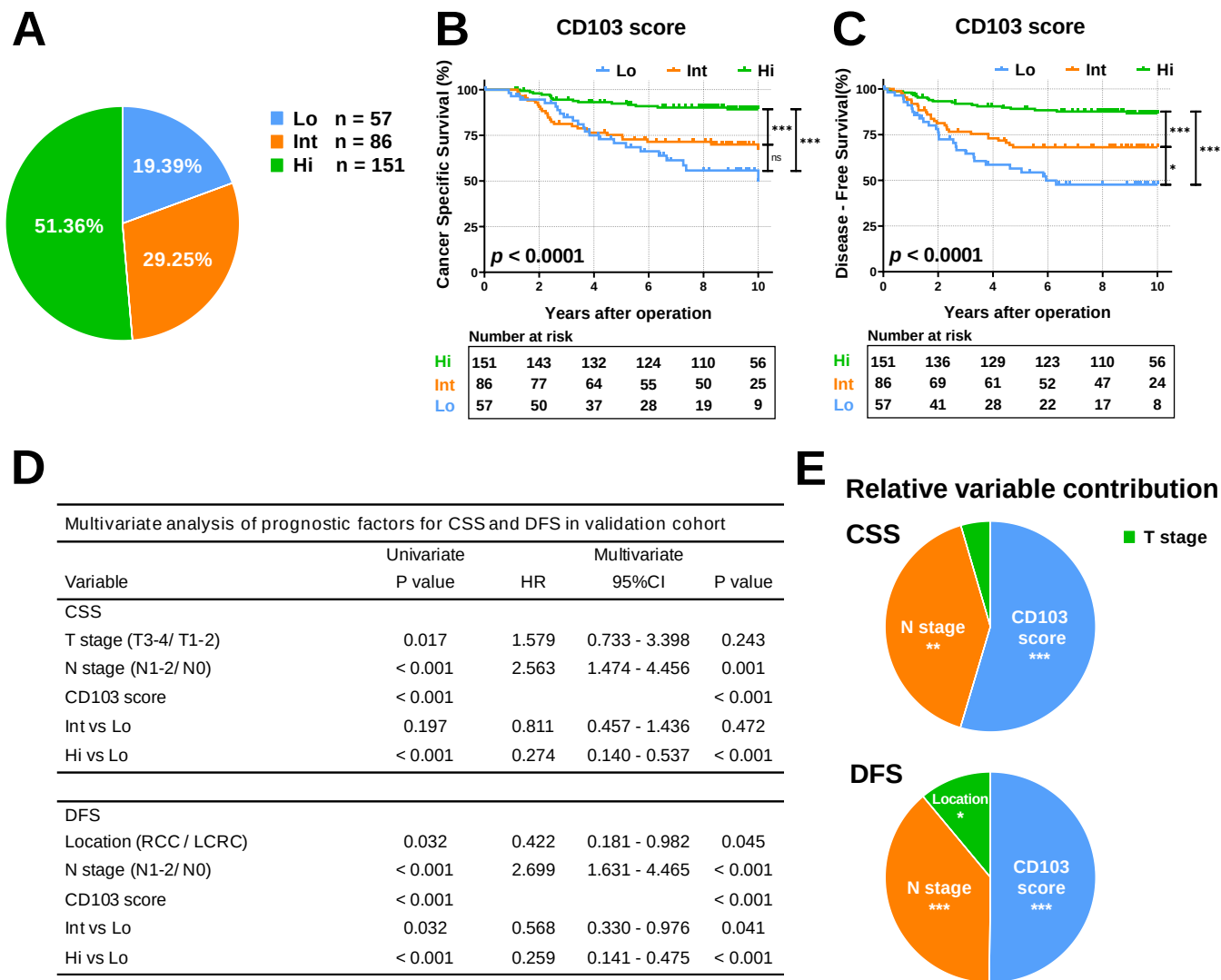
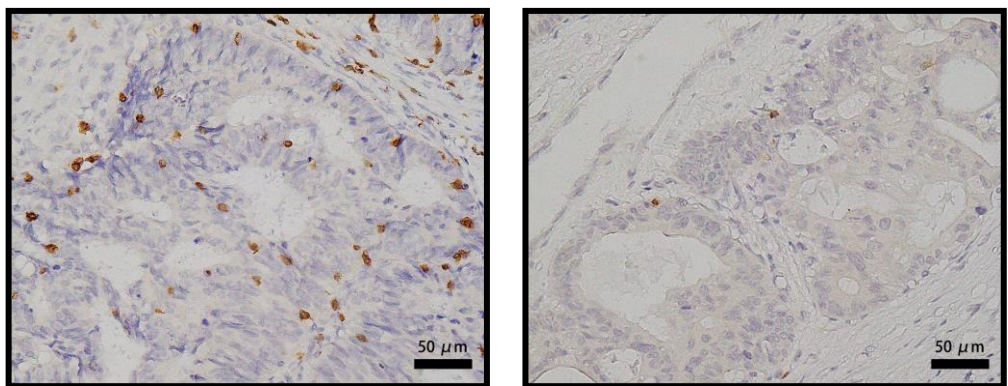


Fig S4 The impact of CD103 score on the outcome of validation cohort of CRC patients. (A) The pie charts illustrated the proportion of the three CD103 score groups within validation cohort. (B, C) The Kaplan-Meier survival analysis showed the probability of CSS and DFS stratified by CD103 score. (D) Cox multivariable regression analysis of CSS and DFS included CD103 score, T stage, N stage and location. (E) The relative contribution of each parameter to survival risk for CSS and DFS was assessed using a chi-squared proportion test. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

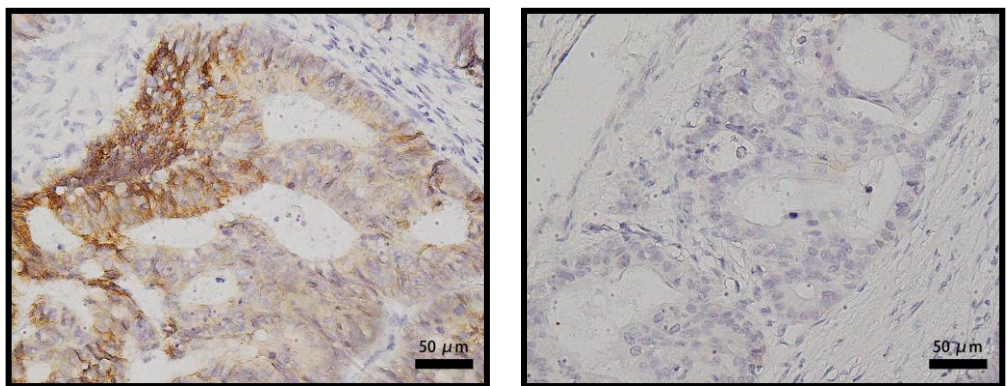
Figure S5

A

CD103



E-cadherin



High expression

Low expression

B

Pearson correlation = 0.634 n = 28

p < 0.001

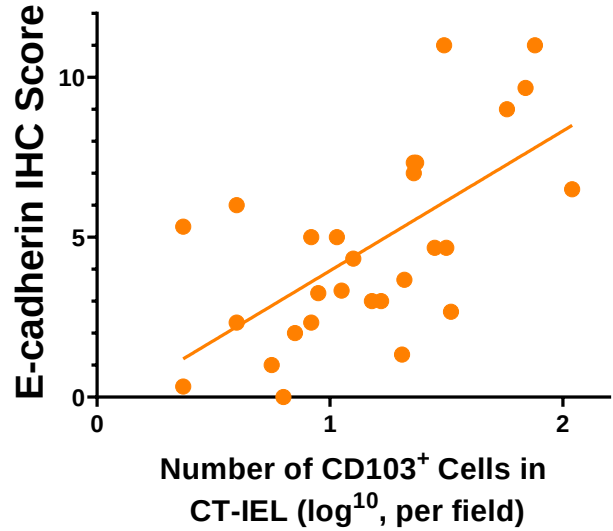


Fig S5 The association between CD103⁺ cell infiltration and E-cadherin levels in CRC tissues. (A) Representative immunohistochemical images illustrate a high infiltration of CD103⁺ cells accompanied by elevated E-cadherin expression, in contrast to a lower infiltration of CD103⁺ cells associated with reduced E-cadherin expression. (B) A positive correlation was observed between the expression levels of CD103⁺ cells and E-cadherin. Scale bars indicate 50 μ m.

Figure S6

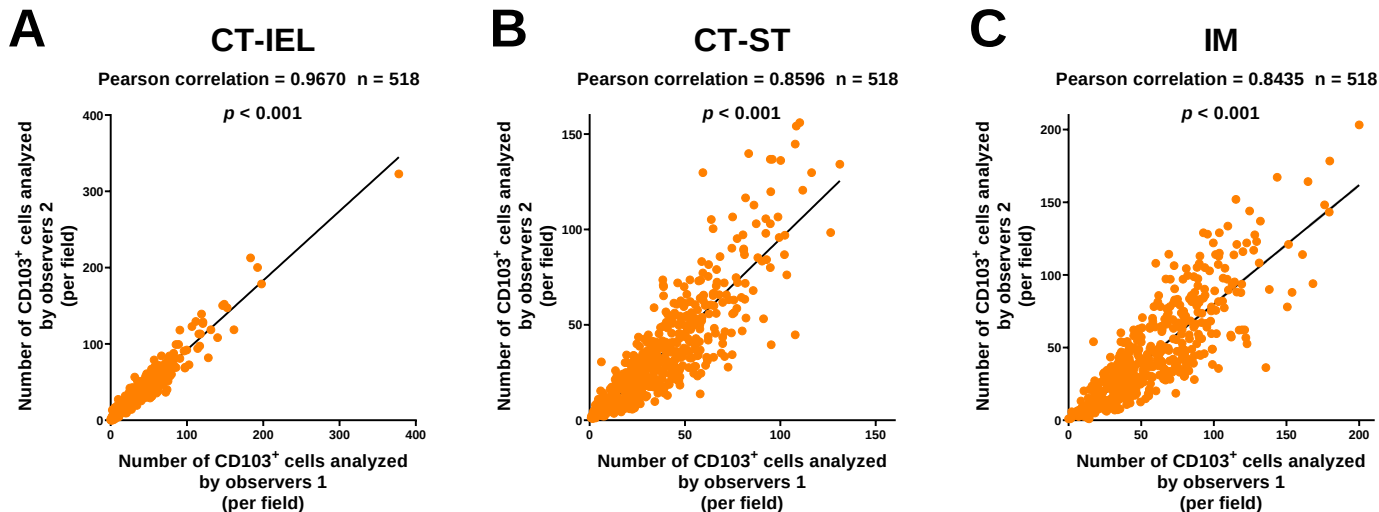


Fig S6 The association between the density of CD103⁺ cells was analyzed by two independent observers. A positive correlation was observed between the density of CD103⁺ cells analyzed by the two independent observers in CT-IEL(A), CT-ST(B), and IM (C) compartments.

Figure S7

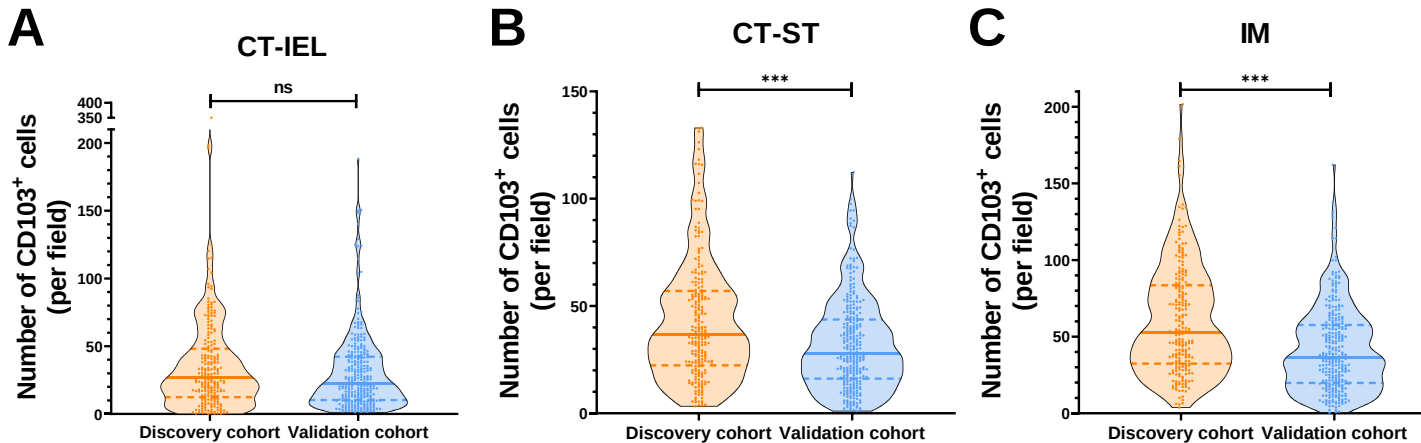


Fig S7 The violin plots illustrate the comparison of CD103⁺ cell densities in the CT-IEL (A), CT-ST (B), and IM (C) compartments for both the discovery and validation cohorts.

Table S1. The demographic and clinical characteristics of the patients.

Variable	Discovery cohort (n = 224)	Validation cohort (n = 294)	Whole cohort (n = 518)	P value discovery cohort vs. validation cohort
Age				
Mean (SD)	61.2 (12.6)	58.2 (12.8)	59.53 (12.78)	
Median [range]	62 [25 - 89]	58 [26 - 86]	60 [25 - 89]	
Interquartile range	54 - 70	49 - 68	51 - 69	
Gender				0.655
Female	102 (45.5%)	127 (43.2%)	229 (44.2%)	
Male	122 (54.5%)	167 (56.8%)	289 (55.8%)	
Histological grade				0.733
Poor	40 (17.9%)	57 (19.4%)	97 (18.7%)	
Moderate, High	184 (82.1%)	237 (80.6%)	421 (81.3%)	
Mucinous				0.005
Yes	27 (12.1%)	15 (5.1%)	42 (8.1%)	
No	197 (87.9%)	279 (94.9%)	476 (91.9%)	
Location				0.115
RCC	50 (22.3%)	49 (16.7%)	99 (19.1%)	
LCRC	174 (77.7%)	245 (83.3%)	419 (80.9%)	
T stage				0.459
T1-2	47 (21.0%)	71 (24.2%)	118 (22.8%)	
T3-4	177 (79.0%)	223 (75.8%)	400 (77.2%)	
N stage				0.466
N0	142 (63.4%)	176 (59.9%)	318 (61.4%)	
N1-2	82 (36.6%)	118 (40.1%)	200 (38.6%)	
TNM stage				0.436
I	41 (18.3%)	60 (20.4%)	101 (19.5%)	
II	101 (45.1%)	116 (39.5%)	217 (41.9%)	
III	82 (36.6%)	118 (40.1%)	200 (38.6%)	
Recurrence and metastasis				0.292
Yes	46 (20.5%)	73 (24.8%)	119 (23.0%)	
No	178 (79.5)	221 (75.2%)	399 (77.0%)	
Vascular invasion				NA
Yes	15 (6.7%)	NA	15 (6.7%)	
No	209 (93.3%)	NA	209 (93.3%)	
Perineural invasion				NA
Yes	20 (8.9%)	NA	20 (8.9%)	
No	204 (91.1%)	NA	204 (91.1%)	

Table S2. Associations between CD103+ cells density and clinicopathologic characteristics of discovery cohort CRC patients in different intratumoral compartments.

Variables	CD103+ cells in CT-IEL		CD103+ cells in CT-ST		CD103+ cells in IM	
	Mean (SD)	<i>P</i>	Mean (SD)	<i>P</i>	Mean (SD)	<i>P</i>
Age(years)		0.350		0.984		0.932
≥50	35.05 (31.55)		43.50 (27.77)		60.53 (34.57)	
<50	41.36 (60.10)		43.60 (34.74)		59.98 (42.34)	
Gender		0.035		0.373		0.213
Female	41.95 (47.13)		45.41 (31.54)		63.71 (37.17)	
Male	31.25 (27.01)		41.93 (26.70)		57.70 (34.73)	
Histological grade		0.267		0.822		0.238
Poor	42.15 (37.17)		42.58 (26.70)		54.36 (32.00)	
Moderate, High	34.81 (37.94)		43.72 (29.52)		61.75 (36.64)	
Mucinous		1.000		0.247		0.024
Yes	36.12 (27.49)		37.45 (22.92)		45.87 (30.45)	
No	36.12 (39.08)		44.35 (29.67)		62.43 (36.20)	
Location		0.207		0.631		0.412
RCC	42.08 (35.04)		41.77 (22.04)		64.12 (31.62)	
LCRC	34.41 (38.51)		44.01 (30.73)		59.38 (37.06)	
T stage		0.215		0.034		0.790
T3-4	34.50 (38.12)		41.40 (27.77)		60.10 (37.23)	
T1-2	42.22 (36.45)		51.47 (32.27)		61.68 (30.72)	
N stage		0.002		0.002		0.003
N1-N2	26.00 (30.57)		35.73 (27.60)		51.06 (33.53)	
N0	41.96 (40.40)		48.00 (28.91)		65.85 (36.22)	
Vascular invasion		0.680		0.853		0.684
Yes	40.02 (47.24)		44.85 (32.94)		64.09 (36.02)	
No	35.84 (37.18)		43.42 (28.77)		60.17 (35.97)	
Perineural invasion		0.036		0.014		0.005
Yes	19.26 (20.40)		28.42 (19.65)		38.94 (32.41)	
No	37.78 (38.75)		44.99 (29.36)		62.54 (35.61)	
Recurrence and metastasis		0.006		0.211		0.005
Yes	22.51 (23.40)		38.74 (30.26)		47.19 (29.13)	
No	39.64 (40.03)		44.75 (28.61)		63.86 (36.76)	

Table S3. Associations between CD103+ cells density and clinicopathologic characteristics of validation cohort CRC patients in different intratumoral compartments.

Variables	CD103+ cells in CT-IEL		CD103+ cells in CT-ST		CD103+ cells in IM	
	Mean (SD)	<i>P</i>	Mean (SD)	<i>P</i>	Mean (SD)	<i>P</i>
Age(years)		0.414		0.093		0.336
≥50	31.29 (28.20)		33.05 (20.50)		42.52 (26.15)	
<50	28.10 (30.92)		28.22 (23.33)		3894 (31.28)	
Gender		0.264		0.595		0.792
Female	28.34 (23.51)		31.10 (19.61)		42.12 (26.69)	
Male	32.15 (32.34)		32.43 (22.55)		41.26 (28.18)	
Histological grade		0.331		0.035		0.123
Poor	33.85 (42.00)		26.52 (21.21)		36.59 (27.61)	
Moderate, High	29.70 (24.76)		33.14 (21.17)		42.85 (27.40)	
Mucinous		0.619		0.017		0.014
Yes	26.88 (41.21)		19.10 (19.80)		24.72 (23.89)	
No	30.70 (28.15)		32.54 (21.20)		42.54 (27.43)	
Location		0.142		0.742		0.837
RCC	36.03 (35.97)		32.77 (19.95)		40.90 (28.58)	
LCRC	29.39 (27.19)		31.67 (21.60)		41.78 (27.34)	
T stage		0.001		< 0.001		0.001
T3-4	27.33 (26.20)		29.20 (19.71)		38.53 (24.99)	
T1-2	40.46 (34.35)		40.19 (23.97)		51.39 (32.53)	
N stage		< 0.001		< 0.001		< 0.001
N1-N2	22.06 (22.68)		25.83 (18.77)		34.18 (22.10)	
N0	36.16 (31.18)		35.89 (21.99)		46.63 (29.62)	
Recurrence and metastasis		< 0.001		< 0.001		< 0.001
Yes	17.81 (19.21)		23.49 (17.98)		31.90 (24.82)	
No	34.70 (30.31)		34.62 (21.63)		44.85 (27.64)	

Table S4. The cutoff ranges of CD103⁺ cells in each cohort

Cohorts	Compartments	Low (cells per field)	Int (cells per field)	Hi (cells per field)
Discovery cohort	CT-IEL	≤ 17.40	17.41 - 39.10	> 39.11
	CT-ST	≤ 26.90	26.91 - 52.00	> 52.01
	IM	≤ 38.30	38.31 - 72.70	> 72.71
Validation cohort	CT-IEL	≤ 14.10	14.11 - 33.70	> 33.71
	CT-ST	≤ 20.00	20.01 - 37.50	> 37.51
	IM	≤ 26.80	26.81 - 50.20	> 50.21

Table S5. Cox analysis of continuous CD103+ cells for CSS and DFS in each cohort

	Variable	HR	95%CI	P value
Discovery cohort	CSS			
	CD103+ cells in CT-IEL	0.976	0.959 - 0.993	0.007
	CD103+ cells in CT-ST	0.991	0.978 - 1.004	0.193
	CD103+ cells in IM	0.980	0.968 - 0.993	0.002
	DFS			
	CD103+ cells in CT-IEL	0.980	0.966 - 0.994	0.005
	CD103+ cells in CT-ST	0.993	0.982 - 1.004	0.242
	CD103+ cells in IM	0.987	0.977 - 0.997	0.009
validation cohort	CSS			
	CD103+ cells in CT-IEL	0.957	0.940 - 0.975	< 0.001
	CD103+ cells in CT-ST	0.970	0.955 - 0.985	< 0.001
	CD103+ cells in IM	0.981	0.971 - 0.992	0.001
	DFS			
	CD103+ cells in CT-IEL	0.964	0.949 - 0.979	< 0.001
	CD103+ cells in CT-ST	0.973	0.959 - 0.986	< 0.001
	CD103+ cells in IM	0.982	0.972 - 0.992	< 0.001
whole cohort	CSS			
	CD103+ cells in CT-IEL	0.966	0.954 - 0.978	< 0.001
	CD103+ cells in CT-ST	0.980	0.970 - 0.990	< 0.001
	CD103+ cells in IM	0.981	0.973 - 0.989	0.001
	DFS			
	CD103+ cells in CT-IEL	0.972	0.962 - 0.982	< 0.001
	CD103+ cells in CT-ST	0.984	0.975 - 0.993	< 0.001
	CD103+ cells in IM	0.984	0.977 - 0.991	< 0.001