

## Supplementary Material

**Additional results.** In this appendix, we provide specific results of adapting medical foundation models to each downstream task. In particular, we provide specific results for histology tasks in Table 3, ophthalmology in Table 4, and radiology tasks in Table 5. Note that these results complement Figure 1 in the main manuscript.

Table 3: Results on histology benchmarks.

Dataset		$S=1$	$S=2$	$S=4$	$S=8$	$S=16$
<i>NCT-CRC</i>	Zero-shot ICML'21 [23]	60.25				
	CoOp IJCV'22 [37]	$57.74 \pm 10.20$	$74.58 \pm 7.30$	$83.55 \pm 2.94$	$86.80 \pm 0.69$	$90.90 \pm 1.21$
	CoCoOp CVPR'22 [36]	$62.80 \pm 7.12$	$74.08 \pm 4.55$	$82.69 \pm 2.46$	$87.27 \pm 0.89$	$89.77 \pm 1.52$
	KgCoOp CVPR'23 [33]	$68.08 \pm 6.65$	$77.80 \pm 3.94$	$86.22 \pm 0.97$	$86.85 \pm 1.62$	$90.86 \pm 0.70$
	CLIP-Adapter IJCV'23 [7]	$67.52 \pm 10.27$	$77.82 \pm 4.05$	$85.72 \pm 2.88$	$88.43 \pm 1.33$	$89.55 \pm 1.53$
	Tip-Adapter-F ECCV'22 [34]	$75.60 \pm 4.06$	$78.25 \pm 2.89$	$85.72 \pm 0.97$	$88.73 \pm 1.07$	$91.58 \pm 0.99$
	Linear Probe (LP) ICML'21 [23]	$70.84 \pm 3.39$	$79.21 \pm 2.40$	$85.44 \pm 0.98$	$89.11 \pm 1.06$	$91.84 \pm 0.76$
	LP+text	<b><math>76.92 \pm 10.08</math></b>	<b><math>82.81 \pm 2.77</math></b>	<b><math>87.42 \pm 5.12</math></b>	<b><math>90.49 \pm 2.23</math></b>	<b><math>91.98 \pm 1.03</math></b>
	Zero-shot ICML'21 [23]	39.05				
	CoOp IJCV'22 [37]	$32.39 \pm 11.06$	$35.88 \pm 12.37$	$51.09 \pm 7.61$	$56.40 \pm 9.15$	$66.67 \pm 1.75$
CoCoOp CVPR'22 [37]	$36.07 \pm 9.24$	$39.94 \pm 7.85$	$49.20 \pm 4.13$	$53.25 \pm 3.97$	$54.62 \pm 4.63$	
KgCoOp CVPR'23 [33]	$39.85 \pm 3.22$	$48.04 \pm 3.48$	$50.30 \pm 4.89$	$63.17 \pm 2.28$	$68.79 \pm 1.34$	
CLIP-Adapter IJCV'23 [7]	$34.29 \pm 9.44$	$49.10 \pm 5.04$	$52.52 \pm 6.31$	$63.02 \pm 3.56$	<b><math>71.78 \pm 0.93</math></b>	
Tip-Adapter-F ECCV'22 [34]	$32.95 \pm 8.94$	$50.39 \pm 4.14$	$49.67 \pm 6.67$	$64.49 \pm 3.94$	$69.56 \pm 1.45$	
Linear probe (LP)	$38.21 \pm 6.26$	<b><math>52.92 \pm 2.19</math></b>	$52.82 \pm 5.75$	<b><math>65.25 \pm 2.18</math></b>	$69.64 \pm 1.82$	
LP+text	<b><math>40.00 \pm 2.30</math></b>	$50.27 \pm 4.70$	<b><math>52.99 \pm 3.71</math></b>	$63.65 \pm 3.26$	$70.74 \pm 2.72$	
<i>SkinCancer</i>	Zero-shot ICML'21 [23]	45.69				
	CoOp IJCV'22 [37]	$48.02 \pm 7.81$	$53.18 \pm 3.45$	$63.49 \pm 3.62$	$71.14 \pm 2.72$	$75.49 \pm 0.9$
	CoCoOp CVPR'22 [36]	$41.02 \pm 6.50$	$53.91 \pm 3.68$	$64.29 \pm 2.16$	$69.61 \pm 3.36$	$76.81 \pm 0.57$
	KgCoOp CVPR'23 [33]	$53.95 \pm 7.18$	$61.48 \pm 2.98$	$71.58 \pm 2.90$	<b><math>78.01 \pm 3.22</math></b>	$80.08 \pm 1.08$
	CLIP-Adapter IJCV'23 [7]	<b><math>55.69 \pm 3.53</math></b>	$60.82 \pm 2.79$	$69.38 \pm 3.33$	$76.32 \pm 2.01$	$80.08 \pm 1.39$
	Tip-Adapter-F ECCV'22 [34]	$53.35 \pm 2.52$	<b><math>61.98 \pm 3.05</math></b>	<b><math>71.95 \pm 2.92</math></b>	$77.81 \pm 1.54$	$80.93 \pm 1.72$
	Linear probe (LP)	$47.09 \pm 3.82$	$57.85 \pm 4.57$	$69.41 \pm 3.81$	$75.55 \pm 1.56$	$79.92 \pm 1.96$
	LP+text	$49.89 \pm 3.24$	$60.98 \pm 3.21$	$71.26 \pm 2.58$	$75.41 \pm 1.48$	<b><math>81.05 \pm 0.89</math></b>

Table 4: Results on ophthalmology benchmarks.

Dataset		$S=1$	$S=2$	$S=4$	$S=8$	$S=16$
MESSIDOR	Zero-shot ICML'21 [23]	57.63 $\pm$ 4.84				
	CoOp IJCV'22 [37]	42.11 $\pm$ 11.78	43.67 $\pm$ 5.60	50.60 $\pm$ 11.84	51.36 $\pm$ 4.80	61.35 $\pm$ 2.36
	CoCoOp CVPR'22 [3]	42.57 $\pm$ 15.94	52.06 $\pm$ 9.82	60.61 $\pm$ 2.60	59.49 $\pm$ 5.35	60.62 $\pm$ 2.55
	KgCoOp CVPR'23 [38]	44.25 $\pm$ 10.64	52.85 $\pm$ 7.75	59.50 $\pm$ 6.76	53.96 $\pm$ 8.12	63.98 $\pm$ 2.38
	CLIP-Adapter IJCV'23 [7]	59.97 $\pm$ 6.18	62.01 $\pm$ 4.95	61.88 $\pm$ 4.60	<b>65.65</b> $\pm$ 5.01	68.71 $\pm$ 3.47
	Tip-Adapter-F ECCV'22 [34]	<b>61.47</b> $\pm$ 6.10	65.42 $\pm$ 1.87	63.12 $\pm$ 3.70	65.10 $\pm$ 5.87	67.74 $\pm$ 3.62
	Linear probe (LP)	51.55 $\pm$ 8.73	56.75 $\pm$ 4.35	60.23 $\pm$ 4.42	61.73 $\pm$ 4.78	<b>69.42</b> $\pm$ 3.10
	LP+text	58.59 $\pm$ 5.12	<b>62.71</b> $\pm$ 4.79	<b>63.29</b> $\pm$ 5.74	64.72 $\pm$ 3.36	66.62 $\pm$ 2.74
FIVES	Zero-shot ICML'21 [23]	73.75 $\pm$ 1.42				
	CoOp IJCV'22 [37]	45.00 $\pm$ 9.07	47.50 $\pm$ 7.75	55.50 $\pm$ 7.53	63.63 $\pm$ 4.72	73.50 $\pm$ 1.66
	CoCoOp CVPR'22 [3]	42.87 $\pm$ 8.07	59.50 $\pm$ 6.65	70.37 $\pm$ 4.90	74.00 $\pm$ 3.06	76.37 $\pm$ 3.59
	KgCoOp CVPR'23 [38]	43.63 $\pm$ 11.26	53.25 $\pm$ 13.81	69.75 $\pm$ 6.87	73.38 $\pm$ 1.09	78.00 $\pm$ 2.60
	CLIP-Adapter IJCV'23 [7]	73.75 $\pm$ 1.72	73.50 $\pm$ 2.55	<b>74.75</b> $\pm$ 3.48	76.00 $\pm$ 2.97	77.25 $\pm$ 3.07
	Tip-Adapter-F ECCV'22 [34]	72.88 $\pm$ 2.11	73.63 $\pm$ 2.48	73.87 $\pm$ 1.27	76.50 $\pm$ 2.46	76.50 $\pm$ 2.36
	Linear Probe (LP) ICML'21 [23]	69.12 $\pm$ 1.09	<b>69.62</b> $\pm$ 6.78	74.00 $\pm$ 3.08	<b>77.38</b> $\pm$ 4.22	<b>81.75</b> $\pm$ 2.14
	LP+text	<b>69.75</b> $\pm$ 5.21	67.75 $\pm$ 6.96	<b>74.38</b> $\pm$ 2.27	<b>77.25</b> $\pm$ 2.15	77.13 $\pm$ 2.04
ODIR200z3	Zero-shot ICML'21 [23]	65.83 $\pm$ 3.84				
	CoOp IJCV'22 [37]	50.83 $\pm$ 15.16	59.17 $\pm$ 19.01	69.33 $\pm$ 13.16	71.00 $\pm$ 9.99	82.50 $\pm$ 2.04
	CoCoOp CVPR'22 [3]	58.17 $\pm$ 10.87	66.00 $\pm$ 7.06	76.50 $\pm$ 8.36	82.33 $\pm$ 4.58	<b>88.50</b> $\pm$ 2.60
	KgCoOp CVPR'23 [38]	58.50 $\pm$ 11.13	74.00 $\pm$ 7.93	80.83 $\pm$ 2.11	81.83 $\pm$ 4.36	84.50 $\pm$ 4.17
	CLIP-Adapter IJCV'23 [7]	64.83 $\pm$ 4.55	68.50 $\pm$ 4.93	74.50 $\pm$ 8.43	81.17 $\pm$ 3.71	87.00 $\pm$ 0.85
	Tip-Adapter-F ECCV'22 [34]	66.50 $\pm$ 2.66	75.67 $\pm$ 5.76	79.50 $\pm$ 5.55	84.66 $\pm$ 3.23	81.67 $\pm$ 3.94
	Linear probe (LP)	72.50 $\pm$ 3.98	81.16 $\pm$ 4.33	85.17 $\pm$ 5.33	<b>86.17</b> $\pm$ 3.64	88.33 $\pm$ 1.49
	LP+text	<b>80.33</b> $\pm$ 7.93	<b>83.00</b> $\pm$ 1.45	<b>86.50</b> $\pm$ 2.32	85.00 $\pm$ 4.62	<b>88.50</b> $\pm$ 1.11

Table 5: Results on radiology benchmarks.

Dataset		$S=1$	$S=2$	$S=4$	$S=8$	$S=16$
CheXpert	Zero-shot ICML'21 [23]	56.10				
	CoOp IJCV'22 [37]	21.90 $\pm$ 7.52	27.80 $\pm$ 8.91	37.00 $\pm$ 4.14	49.10 $\pm$ 2.60	52.90 $\pm$ 4.52
	CoCoOp CVPR'22 [3]	23.30 $\pm$ 9.45	26.60 $\pm$ 5.98	36.10 $\pm$ 5.48	38.60 $\pm$ 5.16	41.80 $\pm$ 3.50
	KgCoOp CVPR'23 [33]	28.40 $\pm$ 4.19	36.80 $\pm$ 4.52	39.90 $\pm$ 3.92	47.70 $\pm$ 2.84	51.60 $\pm$ 3.15
	CLIP-Adapter IJCV'23 [7]	<b>56.00</b> $\pm$ 2.30	<b>55.80</b> $\pm$ 2.11	<b>56.10</b> $\pm$ 2.82	<b>57.70</b> $\pm$ 3.11	<b>58.40</b> $\pm$ 2.13
	Tip-Adapter-F ECCV'22 [34]	54.40 $\pm$ 2.35	54.60 $\pm$ 2.06	55.20 $\pm$ 6.35	54.80 $\pm$ 3.66	57.00 $\pm$ 2.63
	Linear probe (LP)	32.40 $\pm$ 5.68	39.70 $\pm$ 5.16	44.60 $\pm$ 4.40	49.70 $\pm$ 3.33	51.70 $\pm$ 5.30
	LP+text	49.10 $\pm$ 6.37	54.50 $\pm$ 2.28	54.70 $\pm$ 2.94	<b>57.70</b> $\pm$ 3.17	58.10 $\pm$ 1.73
MIMIC	Zero-shot ICML'21 [23]	51.50				
	CoOp IJCV'22 [37]	23.60 $\pm$ 8.01	28.90 $\pm$ 11.15	42.50 $\pm$ 9.39	50.10 $\pm$ 4.97	55.20 $\pm$ 5.10
	CoCoOp CVPR'22 [3]	25.90 $\pm$ 2.56	29.60 $\pm$ 4.92	36.50 $\pm$ 4.14	33.50 $\pm$ 6.40	38.20 $\pm$ 4.34
	KgCoOp CVPR'23 [33]	28.80 $\pm$ 6.42	34.30 $\pm$ 7.62	45.40 $\pm$ 5.00	45.80 $\pm$ 7.33	53.50 $\pm$ 5.09
	CLIP-Adapter IJCV'23 [7]	<b>53.10</b> $\pm$ 3.41	56.00 $\pm$ 4.06	58.10 $\pm$ 4.12	57.50 $\pm$ 2.55	57.60 $\pm$ 2.73
	Tip-Adapter-F ECCV'22 [34]	50.70 $\pm$ 4.23	52.80 $\pm$ 1.86	53.40 $\pm$ 2.92	51.20 $\pm$ 3.19	55.30 $\pm$ 3.26
	Linear probe (LP)	33.60 $\pm$ 5.28	35.70 $\pm$ 4.57	42.90 $\pm$ 6.84	48.40 $\pm$ 3.31	52.90 $\pm$ 4.73
	LP+text	51.10 $\pm$ 5.68	<b>56.20</b> $\pm$ 6.03	<b>58.60</b> $\pm$ 4.42	<b>60.20</b> $\pm$ 3.44	<b>58.20</b> $\pm$ 3.97
RNSA	Zero-shot ICML'21 [23]	73.50				
	CoOp IJCV'22 [37]	67.41 $\pm$ 4.34	65.07 $\pm$ 5.80	70.34 $\pm$ 2.88	72.44 $\pm$ 3.97	<b>78.52</b> $\pm$ 1.27
	CoCoOp CVPR'22 [3]	54.36 $\pm$ 5.56	64.84 $\pm$ 5.93	68.18 $\pm$ 9.15	75.46 $\pm$ 4.28	78.20 $\pm$ 2.20
	KgCoOp CVPR'23 [33]	58.52 $\pm$ 10.43	68.99 $\pm$ 8.55	66.42 $\pm$ 7.60	73.07 $\pm$ 1.72	77.08 $\pm$ 1.03
	CLIP-Adapter IJCV'23 [7]	74.28 $\pm$ 0.92	74.51 $\pm$ 0.55	<b>75.30</b> $\pm$ 0.93	<b>76.98</b> $\pm$ 1.53	76.46 $\pm$ 1.88
	Tip-Adapter-F ECCV'22 [34]	74.53 $\pm$ 0.24	74.15 $\pm$ 0.86	74.63 $\pm$ 2.18	74.08 $\pm$ 2.98	75.47 $\pm$ 0.90
	Linear probe (LP)	71.95 $\pm$ 3.33	73.48 $\pm$ 3.63	72.34 $\pm$ 1.75	75.80 $\pm$ 2.66	76.91 $\pm$ 4.18
	LP+text	<b>74.96</b> $\pm$ 1.74	<b>75.61</b> $\pm$ 1.32	75.06 $\pm$ 1.52	76.51 $\pm$ 1.21	76.16 $\pm$ 3.47