Supplementary Table S5. List of the number and percentage of trainable parameters for PEFT-SP using different combinations of the ESM-2 model family and PEFT method.

Backbone	PEFT method	Total number of parameters	Number of trainable parameters	Percentage of training parameters
ESM2-150M	Fine-tuning	148,166,757	148,165,314	100.00%
	Adapter Tuning	157,639,077	9,497,480	6.02%
	Prompt Tuning	148,201,317	59,720	0.04%
	LoRA	148,678,757	512,000	0.34%
ESM2-650M	Fine-tuning	651,093,537	651,092,094	100.00%
	Adapter Tuning	687,236,897	36,192,200	5.27%
	Prompt Tuning	651,163,937	119,240	0.02%
	LoRA	653,796,897	2,703,360	0.41%
ESM2-3B	Fine-tuning	2,839,103,277	2,839,103,277	100.00%
	Adapter Tuning	3,029,417,517	190,410,440	6.29%
	Prompt Tuning	2,839,249,197	242,120	0.0085%
	LoRA	2,844,837,677	5,734,400	0.20%