

Five-Fold Cross-Validation Performance

1 Performance Plots

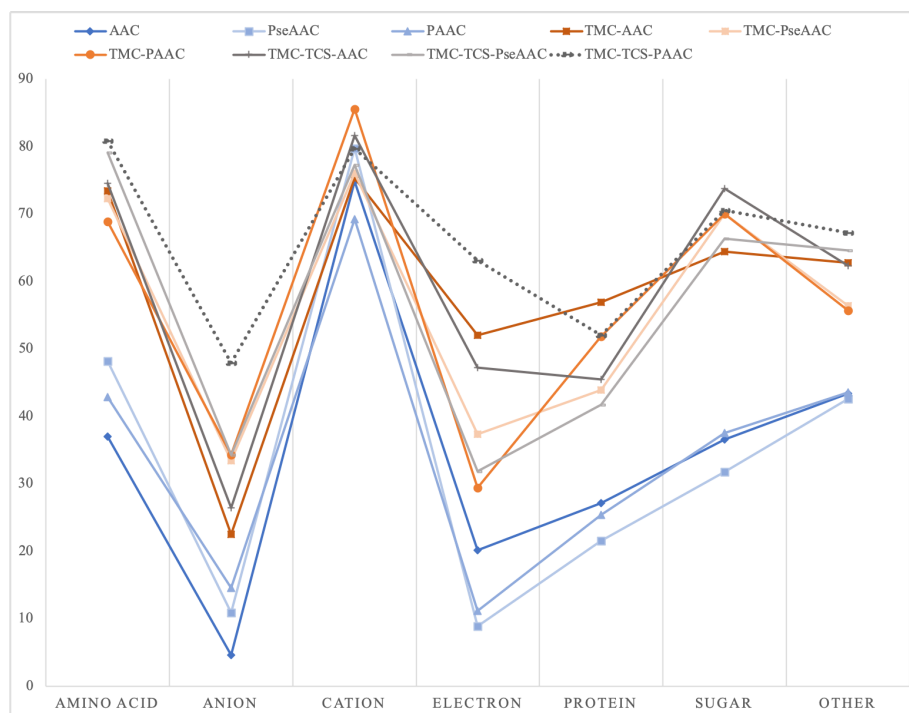


Figure 1: Sensitivity of different methods on different classes
The dotted line represents the performance of TranCEP, the TMC-TCS-PAAC method.

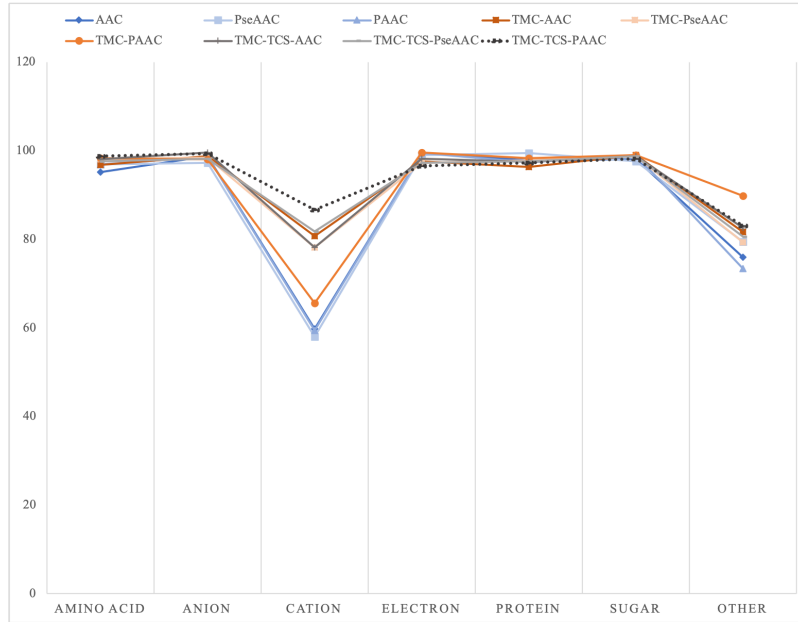


Figure 2: Specificity of different methods on different classes
The dotted line represents the performance of TranCEP, the TMC-TCS-PAAC method.

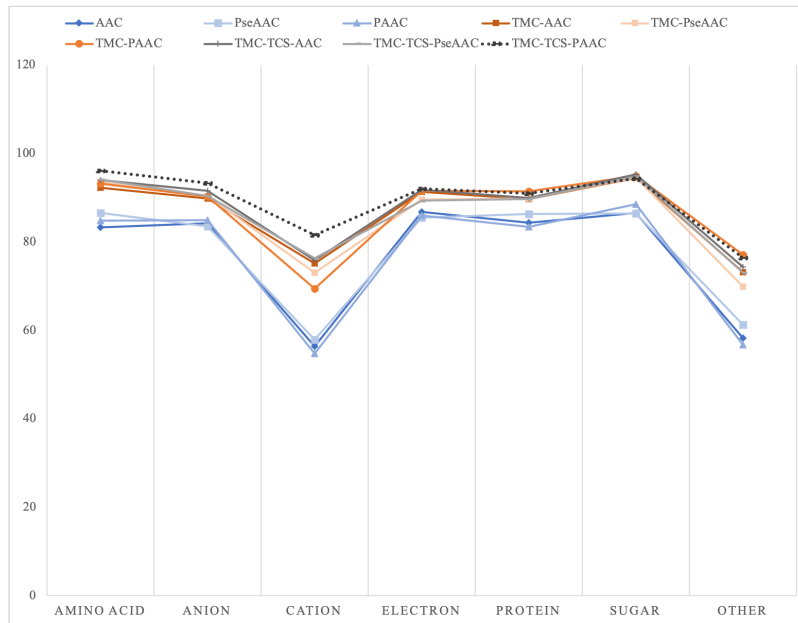


Figure 3: Accuracy of different methods on different classes
The dotted line represents the performance of TranCEP, the TMC-TCS-PAAC method.

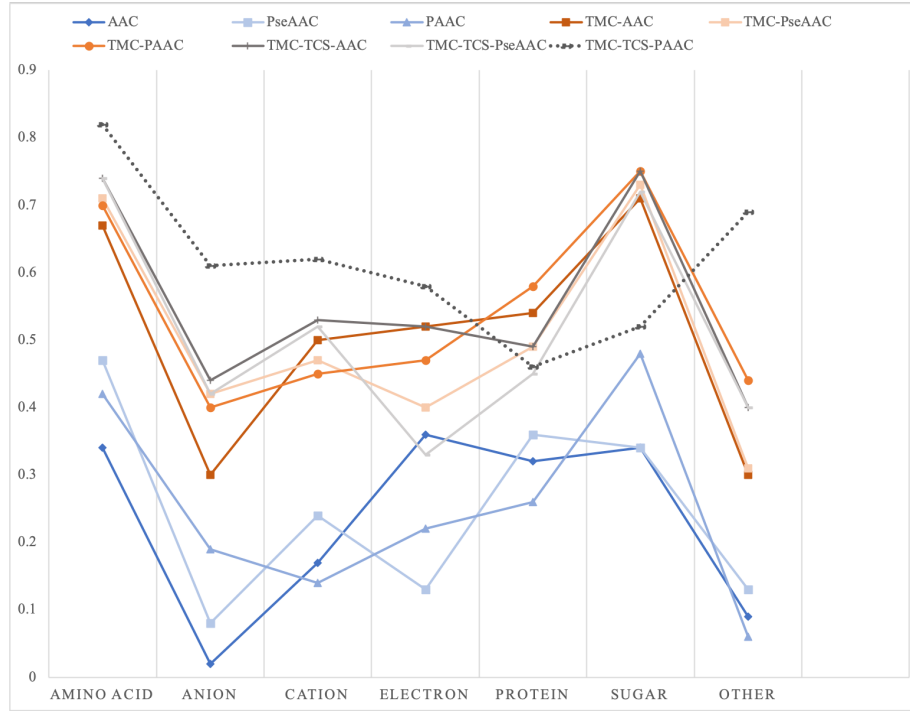


Figure 4: MCC of different methods on different classes
The dotted line represents the performance of TranCEP, the TMC-TCS-PAAC method.

2 Protein compositions

Class	Specificity	Sensitivity	Accuracy	MCC
Amino acid	95.22	37.00	83.28	0.34
Anion	98.76	4.61	84.20	0.02
Cation	59.79	74.83	56.35	0.17
Electron	99.45	20.16	86.81	0.36
Protein	97.90	27.13	84.32	0.32
Sugar	98.05	36.59	86.53	0.34
Other	75.90	43.37	58.30	0.09
Overall			45.38	0.22

Table 1: AAC cross-validation performance

Class	Specificity	Sensitivity	Accuracy	MCC
Amino acid	96.92	42.86	84.77	0.42
Anion	98.61	14.51	84.95	0.19
Cation	59.47	69.24	54.78	0.14
Electron	99.45	11.18	85.98	0.22
Protein	97.33	25.33	83.39	0.26
Sugar	99.03	37.55	88.58	0.48
Other	73.34	43.53	56.72	0.06
Overall			45.89	0.25

Table 2: PAAC cross-validation performance

Class	Specificity	Sensitivity	Accuracy	MCC
Amino acid	96.92	48.21	86.55	0.47
Anion	97.23	10.88	83.48	0.08
Cation	58.07	79.70	57.93	0.24
Electron	99.03	8.87	85.46	0.13
Protein	99.44	21.50	86.32	0.36
Sugar	97.65	31.74	86.47	0.34
Other	79.43	42.61	61.27	0.13
Overall			47.69	0.27

Table 3: PseAAC cross-validation performance

Class	Specificity	Sensitivity	Accuracy	MCC
Amino acid	96.76	73.43	92.23	0.67
Anion	98.75	22.46	89.84	0.30
Cation	80.70	75.35	75.10	0.50
Electron	97.66	51.98	91.30	0.52
Protein	96.35	56.93	89.72	0.54
Sugar	99.03	64.42	94.49	0.71
Other	81.68	62.75	73.21	0.3
Overall			63.08	0.50

Table 4: TMC-AAC cross-validation performance

Class	Specificity	Sensitivity	Accuracy	MCC
Amino acid	98.32	68.86	93.17	0.70
Anion	98.07	34.31	90.32	0.40
Cation	65.60	85.56	69.46	0.45
Electron	99.59	29.39	91.51	0.47
Protein	98.33	51.85	91.47	0.58
Sugar	99.03	69.98	94.97	0.75
Other	89.82	55.65	77.17	0.44
Overall			63.33	0.51

Table 5: TMC-PAAC cross-validation performance

Class	Specificity	Sensitivity	Accuracy	MCC
Amino acid	98.03	72.23	93.52	0.71
Anion	98.47	33.43	90.35	0.42
Cation	78.15	76.04	73.07	0.47
Electron	97.23	37.36	89.52	0.40
Protein	97.88	43.92	89.83	0.49
Sugar	98.75	70.00	94.64	0.73
Other	79.37	56.34	69.93	0.31
Overall			61.79	0.49

Table 6: TMC-PseAAC cross-validation performance

Class	Specificity	Sensitivity	Accuracy	MCC
Amino acid	98.05	74.52	94.05	0.74
Anion	99.58	26.44	91.50	0.44
Cation	78.15	81.66	75.80	0.53
Electron	98.19	47.19	91.81	0.52
Protein	97.48	45.47	89.88	0.49
Sugar	98.76	73.80	95.29	0.75
Other	82.60	62.30	74.27	0.40
Overall			65.13	0.58

Table 7: TCS-TMC-AAC cross-validation performance

Class	Specificity	Sensitivity	Accuracy	MCC
Amino acid	98.82	80.84	96.06	0.82
Anion	99.30	47.89	93.33	0.61
Cation	86.66	79.70	81.50	0.62
Electron	96.58	63.13	92.01	0.58
Protein	97.21	52.00	90.93	0.46
Sugar	98.19	70.51	94.39	0.52
Other	83.02	67.23	76.43	0.69
Overall			69.23	0.63

Table 8: TCS-TMC-PAAC cross-validation performance

Class	Specificity	Sensitivity	Accuracy	MCC
Amino acid	97.60	79.06	94.16	0.74
Anion	98.19	34.26	90.34	0.42
Cation	81.72	77.24	76.31	0.52
Electron	97.22	31.86	89.29	0.33
Protein	97.61	41.68	89.68	0.45
Sugar	98.72	66.35	94.82	0.72
Other	80.64	64.59	73.06	0.40
Overall			63.71	0.51

Table 9: TCS-TMC-PseAAC cross-validation performance