Supplementary Materials

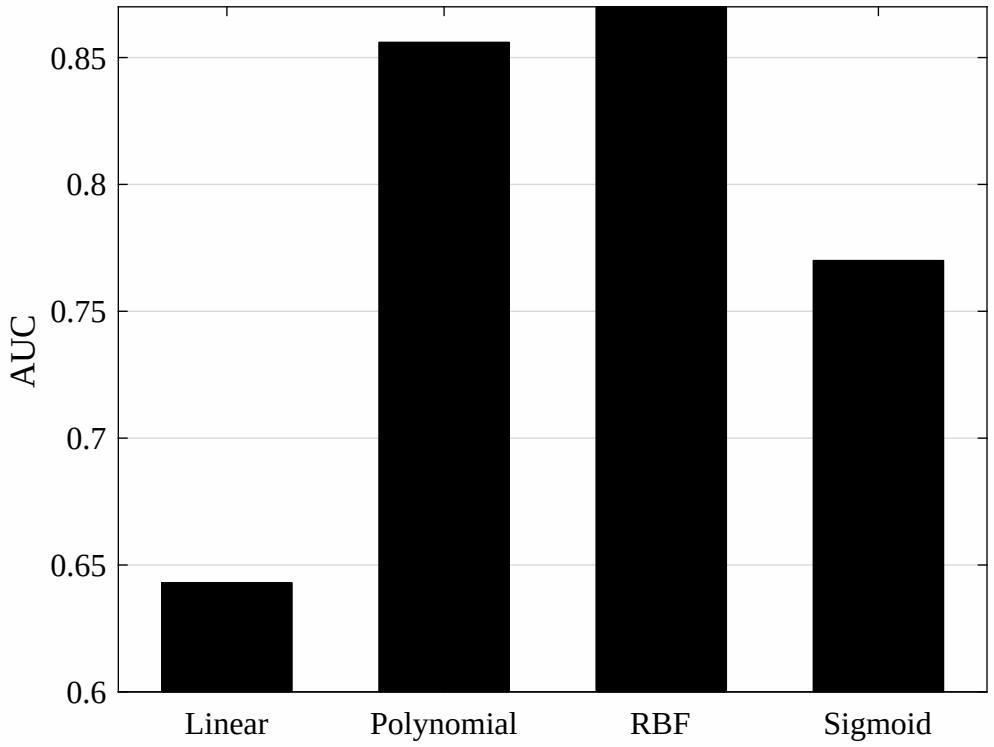

Fig. S1. The comparison of the predictive performance with different kernel functions in SVMnuc. The AUCs were obtained based on the 5-fold cross validation on the training set of YFK16_DNA_3.5.

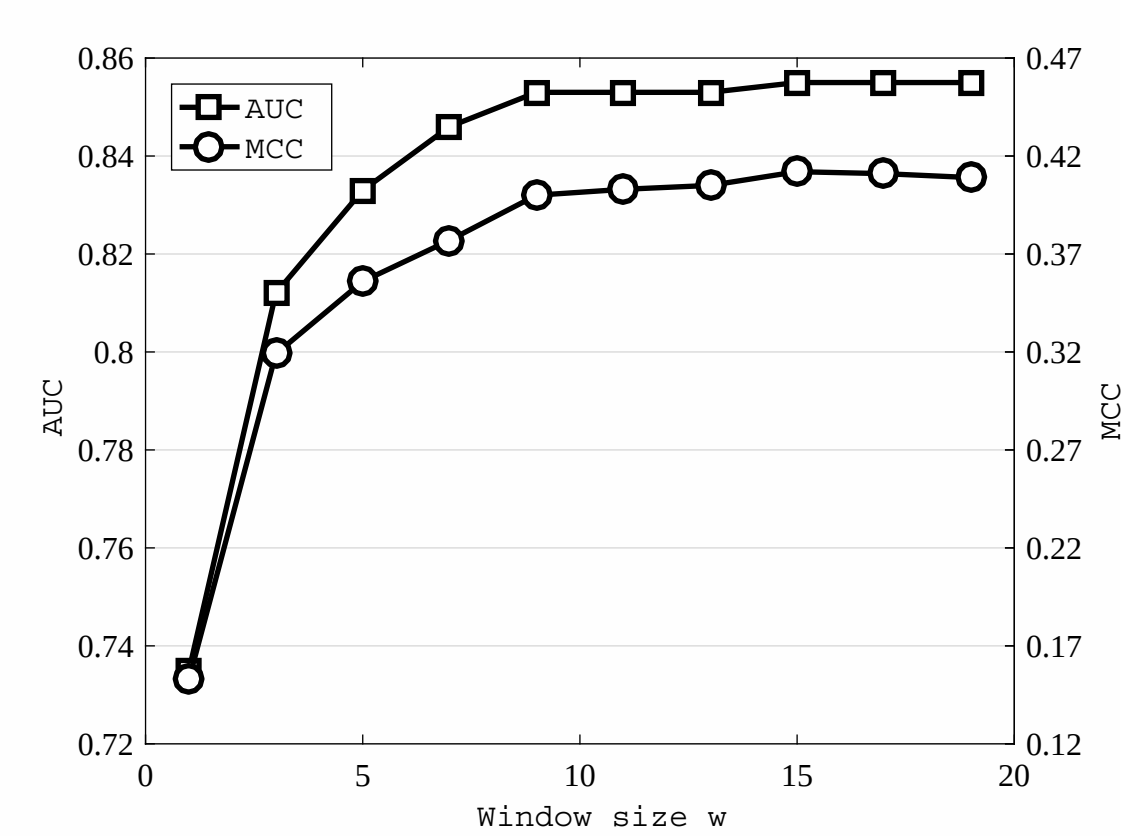

Fig. S2. Optimization of window size on the training set YFK16_DNA_3.5.

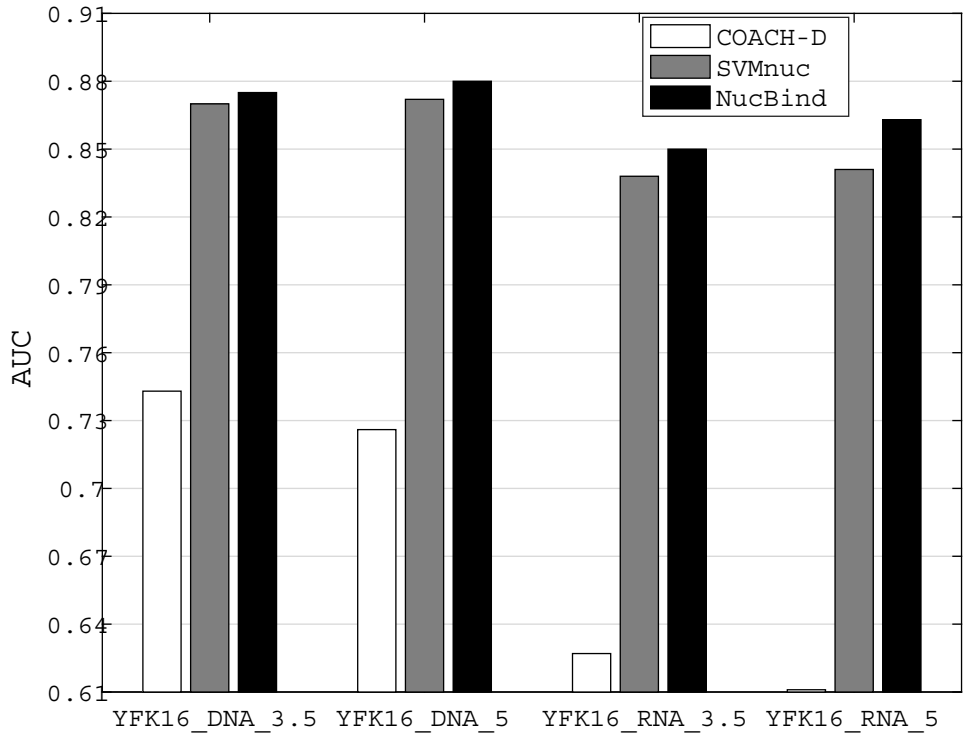

Fig. S3. The performance of SVMnuc, COACH and NucBind on the training sets of YFK16.

Table S1. The *p*-values of the statistical tests for the data in Figure 2. The meaning of each feature group: individual group (1) SS, (2) HMM and (3) PSSM; combination of two feature groups: (4) SS + HMM, (5) SS + PSSM and (6) HMM + PSSM; and all features (7) ALL (i.e., PSSM+ SS+HMM). The '+'/'-' sign in the lower triangle indicates that the AUC for the method from the row is higher/lower than the one from the corresponding column.

Feature	1	2	3	4	5	6	7
1		$1.6*10^{-14}$	$2.5*10^{-14}$	$8.4*10^{-15}$	$1.3*10^{-14}$	$1.8*10^{-14}$	$8.7*10^{-15}$
2	+		0.1679	0.1111	$1.6*10^{-05}$	$3.6*10^{-07}$	$3.3*10^{-08}$
3	+	+		0.4176	$1.1*10^{-09}$	$1.0*10^{-11}$	$2.7*10^{-14}$
4	+	+	-		$1.2*10^{-05}$	$4.1*10^{-07}$	$1.7*10^{-08}$
5	+	+	+	+		$8.0*10^{-06}$	$8.0*10^{-13}$
6	+	+	+	+	+		$2.9*10^{-08}$
7	+	+	+	+	+	+	

Table S2. The *p*-values of the statistical tests for the data in Figure S3.

Dataset	NucBind vs SVMnuc	NucBind vs COACH-D
YFK16_DNA_3.5	0.0013	$3.8*10^{-14}$
YFK16_DNA_5	0.0677	$4.7*10^{-06}$
YFK16_RNA_3.5	$1.1*10^{-04}$	$1.8*10^{-16}$
YFK16_RNA_5	0.0019	$3.7*10^{-14}$

Table S3. **Comparison with other methods on the independent test sets based on MCC**. The results for other methods are taken directly from the corresponding references. The highest values are highlighted in bold type.

Method	Dataset							
	YFK16[a]		YFK16[b]		YK17[a]	YK17[b]	MW15[a]	MW15[b]
Cutoff	3.5	5	3.5	5	5	5	5	5
Pprint	NA	NA	0.084	0.079	NA	0.11	NA	NA
RNABindR	NA	NA	0.105	0.120	NA	0.1	NA	NA
DP-Bind(klr)	0.246	0.270	NA	NA	0.2	NA	NA	NA
BindN+	0.256	0.266	0.219	0.222	0.18	0.08	NA	NA
DBS_PSSM	0.266	0.298	NA	NA	0.17	NA	NA	NA
DRNApred	NA	NA	NA	NA	0.21	0.12	NA	NA
DRNApred*	0.232	0.270	0.056	0.07	0.21	0.12	0.164	0.006
COACH-D	0.340	0.342	**0.356**	**0.396**	0.27	**0.19**	0.283	0.082
SVMnuc	0.336	0.381	0.205	0.214	0.26	0.13	0.378	0.182
NucBind	**0.355**	**0.386**	0.210	0.225	**0.28**	0.15	**0.384**	**0.184**

[a]DNA-binding; [b]RNA-binding; *The server version of DRNApred.

Table S4. **Comparison with other methods on the independent test sets based on cross prediction ratio (*Rc*)**. The results for other methods are taken directly from the corresponding references. The lowest values are highlighted in bold type.

Method	Dataset							
	YFK16[a]		YFK16[b]		YK17[a]	YK17[b]	MW15[a]	MW15[b]
Cutoff	3.5	5	3.5	5	3.5	3.5	5	5
Pprint	NA	NA	0.48	0.45	NA	0.10	NA	NA
RNABindR	NA	NA	0.64	0.60	NA	0.16	NA	NA
DP-Bind(klr)	0.44	0.40	NA	NA	0.15	NA	NA	NA
BindN+	0.29	0.25	0.50	0.43	0.13	0.20	NA	NA
DBS_PSSM	0.49	0.43	NA	NA	0.18	NA	NA	NA
DRNApred	NA	NA	NA	NA	0.06	**0.02**	NA	NA
DRNApred*	**0.06**	**0.06**	0.02	0.02	0.06	**0.02**	0.27	0.02
COACH-D	0.09	0.07	**0.01**	**0.01**	**0.04**	**0.02**	0.25	**0**
SVMnuc	0.10	0.16	0.08	0.17	0.06	0.08	**0.24**	0.19
NucBind	0.09	0.16	0.08	0.17	0.06	0.08	**0.24**	0.18

[a]DNA-binding; [b]RNA-binding; *The server version of DRNApred.

Table S5. Detailed comparison of the predictive performance of the proposed methods and DRNApred on all test sets. The best values are highlighted in bold type.

Dataset	Method	Rec	Pre	MCC	AUC	*Rr*	*Rc*
YK17_DNA	DRNApred	NA	NA	0.21	0.77	NA	0.06
	DRNApred*	0.25	0.25	0.21	0.77	6.8	0.06
	COACH	**0.29**	0.33	0.27	0.69	9.4	**0.04**
	SVMnuc	0.18	0.46	0.26	0.80	**9.9**	0.06
	NucBind	0.20	**0.47**	**0.28**	**0.81**	**9.9**	0.06
YK17_RNA	DRNApred	NA	NA	0.12	0.67	NA	**0.02**
	DRNApred*	0.16	0.16	0.12	0.67	5	**0.02**
	COACH	**0.19**	0.25	**0.19**	0.64	**7.9**	0.05
	SVMnuc	0.10	0.24	0.13	0.74	5.7	0.08
	NucBind	0.11	**0.28**	0.15	**0.75**	5.7	0.08
YFK16_DNA_3.5	DRNApred*	**0.32**	0.25	0.23	0.76	6.5	**0.06**
	COACH	0.15	**0.70**	0.31	0.77	**12.2**	0.07
	SVMnuc	0.26	0.51	0.34	**0.83**	10.6	0.09
	NucBind	0.29	0.50	**0.35**	**0.83**	10.6	0.09
YFK16_DNA_5	DRNApred*	0.29	0.38	0.27	0.74	5.5	**0.06**
	COACH	0.10	**0.68**	0.24	0.76	**8.1**	**0.06**
	SVMnuc	0.37	0.51	0.38	**0.82**	7.7	0.16
	NucBind	**0.38**	0.51	**0.39**	**0.82**	7.7	0.16
YFK16_RNA_3.5	DRNApred*	0.09	0.08	0.06	0.69	2.8	0.02
	COACH	**0.30**	**0.45**	**0.36**	0.71	**24.7**	**0.01**
	SVMnuc	0.19	0.26	0.20	0.78	13.1	0.08
	NucBind	0.18	0.29	0.21	**0.80**	13.1	0.08
YFK16_RNA_5	DRNApred*	0.09	0.12	0.07	0.67	3.3	0.02
	COACH	0.27	**0.62**	**0.40**	0.73	**20**	**0.01**
	SVMnuc	**0.28**	0.23	0.21	0.79	9.5	0.17
	NucBind	**0.28**	0.24	0.22	**0.80**	9.5	0.17
MW15_DNA	DRNApred*	0.24	0.32	0.16	0.72	3.9	0.27
	COACH	0.32	0.35	0.28	0.71	6.6	0.25
	SVMnuc	**0.36**	**0.48**	**0.38**	**0.83**	**9.9**	**0.24**
	NucBind	**0.36**	**0.49**	**0.38**	**0.83**	**9.9**	**0.24**
MW15_RNA	DRNApred*	0.02	0.12	-0.01	0.43	1.7	0.02
	COACH	0.03	**0.26**	0.08	0.58	6.1	**0.00**
	SVMnuc	**0.27**	0.18	**0.18**	**0.79**	**8.9**	0.19
	NucBind	**0.27**	0.18	**0.18**	**0.79**	**8.9**	0.18

*The server version of DRNApred.

Table S6. The *p*-values of the statistical tests for the AUC differences between our methods and DRNApred. (-) indicates that DRNApred has a higher AUC than the compared method.

Dataset	COACH-D	SVMnuc	NucBind
YK17_DNA	0.0013 (-)	0.0179	0.0104
YK17_RNA	0.3714 (-)	0.0037	0.0014
YFK16_DNA_3.5	0.5684	$5.9*10^{-06}$	$4.4*10^{-06}$
YFK16_DNA_5	0.7002	$5.9*10^{-04}$	$5.5*10^{-04}$
YFK16_RNA_3.5	0.2425	0.0024	$3.4*10^{-04}$
YFK16_RNA_5	0.8585	0.0013	$5.5*10^{-05}$
MW15_DNA	0.3329 (-)	$3.5*10^{-04}$	$3.5*10^{-04}$
MW15_RNA	0.0069	$6.4*10^{-05}$	$5.5*10^{-05}$