

Supporting information

Delineation of the DNA structural features of eukaryotic core promoter classes.

Akkinepally Vanaja^{1,2} and Venkata Rajesh Yella^{1*}

¹Department of Biotechnology, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Guntur 522502, Andhra Pradesh, India

²KL College of Pharmacy, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Guntur 522502, Andhra Pradesh, India

*Corresponding author:

Venkata Rajesh Yella, Department of Biotechnology, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Guntur – 522502, Andhra Pradesh, India, Tel: +91-863-2399999, Extn-1021, Email: yvrajesh_bt@kluniversity.in, Website: <https://www.kluniversity.in/bt/faculty-list.aspx>

Running title: DNA structural features of eukaryotic promoters

Abbreviations: TSS- Transcription start site, PIC- pre-initiation complex.

Keywords: Eukaryotic promoter, DNA Shape, DNA flexibility, DNA stability, Non-B-DNA.

Conflict of interest: None declared

Promoter Class	<i>S. cerevisiae</i>	<i>S. pombe</i>	<i>P. falciparum</i>	<i>C.elegans</i>	<i>Apis mellifera</i>	<i>D.melanogaster</i>	<i>D. rerio</i>	<i>Gallus gallus</i>	<i>C. familiaris</i>	<i>R. norvegicus</i>	<i>M. musculus</i>	<i>M. mulatta</i>	Human	<i>A. thaliana</i>	<i>Zea mays</i>
TATA-only	2.44	4.00	17.95	3.32	4.44	3.78	1.69	1.17	1.02	1.28	1.43	0.79	1.12	9.57	4.43
Inr-only	15.84	18.66	2.38	31.13	24.06	28.36	28.93	19.60	19.95	28.09	30.25	26.05	28.19	18.38	23.36
TCT-only	0.12	1.36	1.69	2.84	0.40	0.51	0.86	1.53	1.83	1.58	1.10	1.44	1.27	2.30	1.18
BREu-only	0.12	0.13	0.00	0.63	0.33	0.31	0.74	8.69	7.30	3.84	3.98	5.98	5.68	0.08	2.82
BREd-only	15.13	17.29	31.50	10.26	13.75	8.04	11.40	5.40	6.39	6.13	6.17	6.07	5.71	10.41	5.49
XCPE1-only	0.04	0.00	0.00	0.02	0.04	0.01	0.15	0.53	0.46	0.43	0.44	0.45	0.45	0.03	0.12
DRE-only	0.43	0.44	0.00	0.44	1.72	4.84	0.00	0.04	0.06	0.03	0.02	0.03	0.01	0.35	0.13
DPE-only	0.16	0.13	0.02	0.06	0.50	0.34	0.35	0.30	0.32	0.35	0.25	0.37	0.37	0.09	0.16
PB-only	0.51	0.29	0.00	0.66	1.32	1.19	0.69	2.27	2.26	1.39	1.26	1.82	1.49	0.59	1.48
No Motif Class	59.29	46.60	21.50	30.70	35.99	25.52	43.55	49.90	50.07	45.94	43.95	45.67	44.27	43.39	51.29
BREd, BREu	0.00	0.04	0.00	0.11	0.02	0.07	0.09	0.30	0.22	0.25	0.20	0.35	0.32	0.03	0.12
BREd, BREu, DPE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01
BREd, BREu, DPE, Inr	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREd, BREu, DRE	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREd, BREu, DRE, Inr	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREd, BREu, Inr	0.02	0.00	0.00	0.13	0.09	0.04	0.14	0.21	0.13	0.14	0.14	0.16	0.18	0.01	0.06
BREd, BREu, Inr, PB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.01	0.00	0.00
BREd, BREu, Inr, TATA	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00
BREd, BREu, Inr, TCT	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
BREd, BREu, PB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.03	0.01	0.02	0.02	0.00	0.00

BREd, BREu, PB, TATA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
BREd, BREu, TATA	0.00	0.00	0.02	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREd, BREu, TCT	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.01
BREd, BREu, XCPE1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00
BREd, DPE	0.08	0.00	0.00	0.03	0.15	0.08	0.15	0.07	0.08	0.03	0.05	0.09	0.05	0.03	0.02
BREd, DPE, DRE	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREd, DPE, Inr	0.02	0.02	0.00	0.03	0.06	0.13	0.05	0.02	0.02	0.04	0.01	0.01	0.05	0.01	0.00
BREd, DPE, Inr, PB	0.00	0.00	0.00	0.00	0.06	0.05	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
BREd, DPE, Inr, TCT	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREd, DPE, PB	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.02	0.00	0.03	0.00	0.00	0.00	0.01	0.00
BREd, DPE, TATA	0.02	0.00	0.02	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
BREd, DPE, TCT	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREd, DPE, XCPE1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
BREd, DRE	0.12	0.13	0.00	0.24	0.70	1.52	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.08	0.01
BREd, DRE, Inr	0.04	0.08	0.00	0.22	0.28	0.78	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.01
BREd, DRE, Inr, PB	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREd, DRE, Inr, TATA	0.00	0.00	0.00	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREd, DRE, Inr, TCT	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREd, DRE, PB	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREd, DRE, TATA	0.00	0.02	0.00	0.00	0.02	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
BREd, DRE, TCT	0.00	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREd, Inr	3.99	6.15	4.74	8.52	7.02	9.59	6.93	2.65	2.46	3.57	4.11	3.02	3.55	4.17	1.81
BREd, Inr, PB	0.06	0.04	0.00	0.14	0.29	0.61	0.14	0.14	0.10	0.08	0.04	0.14	0.03	0.03	0.07
BREd, Inr, PB, TATA	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03
BREd, Inr, PB, TCT	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREd, Inr, TATA	0.20	0.23	2.06	0.64	0.42	0.72	0.22	0.05	0.08	0.09	0.14	0.07	0.12	0.83	0.31
BREd, Inr, TATA, TCT	0.00	0.02	0.10	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00
BREd, Inr, TCT	0.04	0.13	0.37	0.44	0.09	0.09	0.06	0.02	0.08	0.04	0.08	0.07	0.08	0.14	0.04
BREd, Inr, XCPE1	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.03	0.02	0.00	0.00
BREd, PB	0.08	0.06	0.00	0.13	0.35	0.30	0.15	0.20	0.27	0.22	0.16	0.25	0.16	0.20	0.13

BREd, PB, TATA	0.00	0.00	0.00	0.00	0.04	0.04	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01
BREd, PB, TCT	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00
BREd, PB, XCPE1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
BREd, TATA	0.43	0.98	13.21	0.90	1.32	0.88	0.17	0.11	0.24	0.10	0.16	0.09	0.09	1.98	0.53
BREd, TATA, TCT	0.00	0.00	0.57	0.02	0.02	0.00	0.01	0.00	0.02	0.02	0.01	0.02	0.01	0.04	0.01
BREd, TCT	0.06	0.27	1.46	0.90	0.11	0.16	0.11	0.21	0.29	0.26	0.15	0.35	0.16	0.43	0.12
BREd, XCPE1	0.04	0.00	0.00	0.00	0.07	0.01	0.03	0.11	0.03	0.09	0.06	0.02	0.07	0.03	0.00
BREu, DPE	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.07	0.02	0.04	0.02	0.09	0.05	0.00	0.00
BREu, DPE, DRE, Inr	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREu, DPE, Inr	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.03	0.03	0.01	0.03	0.02	0.00	0.00
BREu, DPE, Inr, PB	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
BREu, DPE, PB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.01	0.01	0.03	0.02	0.00	0.00
BREu, DPE, PB, XCPE1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREu, DPE, TCT	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREu, DRE	0.00	0.00	0.00	0.02	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREu, DRE, Inr	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREu, DRE, TCT	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREu, Inr	0.02	0.13	0.00	0.69	0.57	0.28	0.45	3.06	2.54	2.13	2.27	3.34	3.07	0.06	1.20
BREu, Inr, PB	0.00	0.00	0.00	0.02	0.07	0.05	0.02	0.16	0.19	0.09	0.09	0.09	0.10	0.00	0.03
BREu, Inr, PB, TATA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00
BREu, Inr, TATA	0.02	0.00	0.00	0.02	0.02	0.04	0.04	0.04	0.08	0.03	0.02	0.07	0.03	0.00	0.12
BREu, Inr, TCT	0.00	0.00	0.00	0.06	0.02	0.00	0.01	0.05	0.00	0.01	0.01	0.05	0.01	0.00	0.03
BREu, Inr, XCPE1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00
BREu, PB	0.02	0.00	0.00	0.00	0.04	0.02	0.02	0.37	0.40	0.19	0.22	0.26	0.23	0.00	0.10
BREu, PB, TATA	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BREu, PB, TCT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
BREu, TATA	0.00	0.02	0.00	0.03	0.02	0.04	0.00	0.11	0.08	0.05	0.04	0.03	0.02	0.00	0.31
BREu, TCT	0.00	0.00	0.00	0.05	0.00	0.02	0.00	0.20	0.16	0.09	0.08	0.09	0.10	0.00	0.08
BREu, XCPE1	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.14	0.04	0.02	0.06	0.04	0.00	0.00
DPE, DRE	0.00	0.00	0.00	0.00	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DPE, DRE, Inr	0.00	0.00	0.00	0.00	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DPE, DRE, TCT	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DPE, Inr	0.04	0.00	0.00	0.08	0.59	0.56	0.22	0.14	0.24	0.22	0.23	0.19	0.25	0.03	0.04
DPE, Inr, PB	0.00	0.00	0.00	0.02	0.06	0.25	0.02	0.00	0.03	0.04	0.02	0.03	0.03	0.00	0.01
DPE, Inr, PB, TATA	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
DPE, Inr, PB, TCT	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DPE, Inr, TATA	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.02	0.00	0.02	0.01	0.01	0.02	0.01	0.00
DPE, Inr, TCT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00
DPE, PB	0.02	0.00	0.00	0.00	0.02	0.14	0.03	0.11	0.11	0.07	0.05	0.12	0.05	0.00	0.03
DPE, PB, TCT	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DPE, TATA	0.00	0.00	0.00	0.00	0.02	0.00	0.03	0.02	0.03	0.01	0.06	0.00	0.02	0.02	0.01
DPE, TCT	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.03	0.02	0.00	0.02	0.01	0.00	0.01
DPE, XCPE1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
DRE, Inr	0.06	0.13	0.00	0.75	0.72	2.87	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.12	0.04
DRE, Inr, PB	0.00	0.00	0.00	0.00	0.02	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
DRE, Inr, TATA	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01
DRE, Inr, TCT	0.00	0.00	0.00	0.13	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
DRE, PB	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
DRE, TATA	0.00	0.08	0.00	0.00	0.17	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00
DRE, TATA, TCT	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DRE, TCT	0.00	0.02	0.00	0.05	0.04	0.21	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00
Inr, PB	0.06	0.08	0.00	0.66	1.52	2.19	0.50	0.71	0.56	0.72	0.62	0.68	0.72	0.15	0.62
Inr, PB, TATA	0.00	0.00	0.00	0.03	0.04	0.17	0.02	0.02	0.03	0.01	0.00	0.00	0.02	0.03	0.13
Inr, PB, TATA, TCT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Inr, PB, TCT	0.00	0.00	0.00	0.08	0.02	0.01	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.00	0.00
Inr, PB, XCPE1	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.00
Inr, TATA	0.41	1.77	1.66	2.29	1.78	3.64	1.23	0.75	1.02	1.45	1.35	0.59	0.96	4.63	2.61
Inr, TATA, TCT	0.00	0.04	0.02	0.14	0.04	0.01	0.04	0.04	0.02	0.01	0.01	0.01	0.01	0.16	0.03
Inr, TATA, XCPE1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Inr, TCT	0.06	0.52	0.30	2.23	0.17	0.36	0.36	0.18	0.33	0.39	0.29	0.34	0.40	0.95	0.45

Inr, XCPE1	0.00	0.02	0.00	0.00	0.00	0.01	0.07	0.07	0.00	0.10	0.13	0.08	0.09	0.01	0.03
PB, TATA	0.00	0.00	0.00	0.00	0.07	0.18	0.03	0.02	0.06	0.01	0.01	0.02	0.01	0.05	0.22
PB, TATA, TCT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
PB, TCT	0.00	0.02	0.00	0.03	0.00	0.02	0.01	0.11	0.03	0.03	0.02	0.08	0.02	0.02	0.02
PB, XCPE1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.01	0.02	0.01	0.01	0.00	0.00
TATA, TCT	0.04	0.08	0.32	0.03	0.02	0.00	0.03	0.02	0.08	0.03	0.03	0.10	0.06	0.28	0.06
TATA, TCT, XCPE1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
TATA, XCPE1	0.00	0.00	0.00	0.02	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.00

Table S1: Percentage of core promoter regions with consensus sequence motifs. The percentage of promoters with two or more promoter motifs is less when compared to specific motif-only classes.

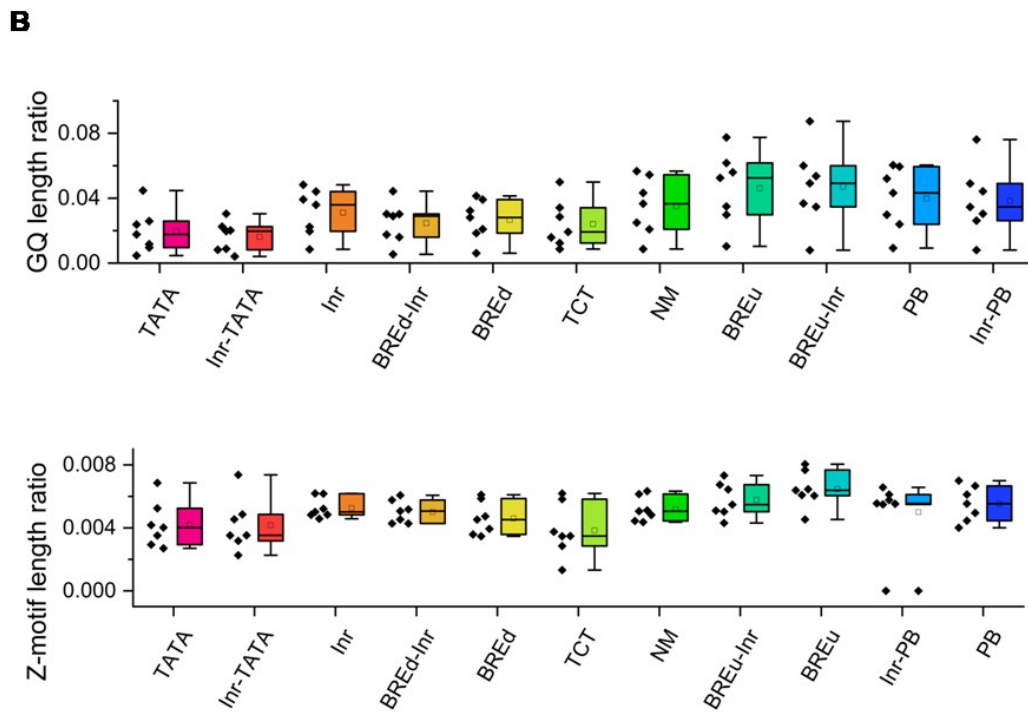
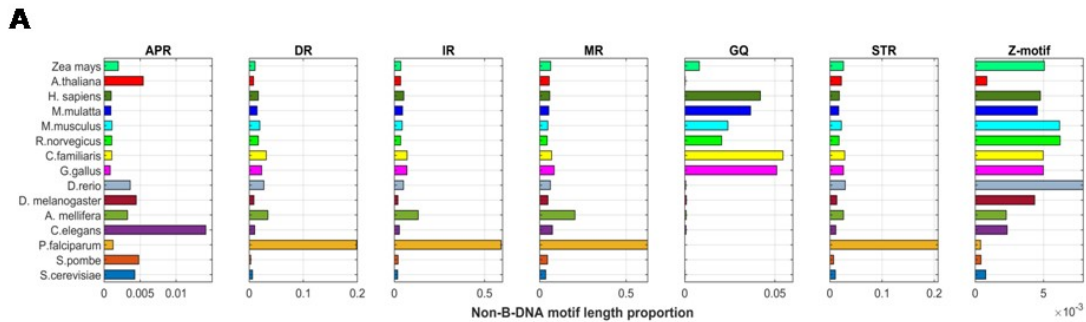


Figure S1: Non-B-DNA enrichment characteristics of eukaryotic promoter classes. (A) Comparison of seven non-B-DNA motif length ratios in 15 species. (B) Box plots for comparison of G-quadruplex motifs and Z-DNA motifs for eleven promoter classes. Length ratios of chicken, mammals, and *Zea mays* were displayed for G-quadruplex motifs and Z-DNA motifs, respectively. Code: APR: A-phased repeats, DR: direct repeats, MR: mirror repeats, IR: inverted repeats, GQ: G-quadruplex motifs, and STR: Short tandem repeats.

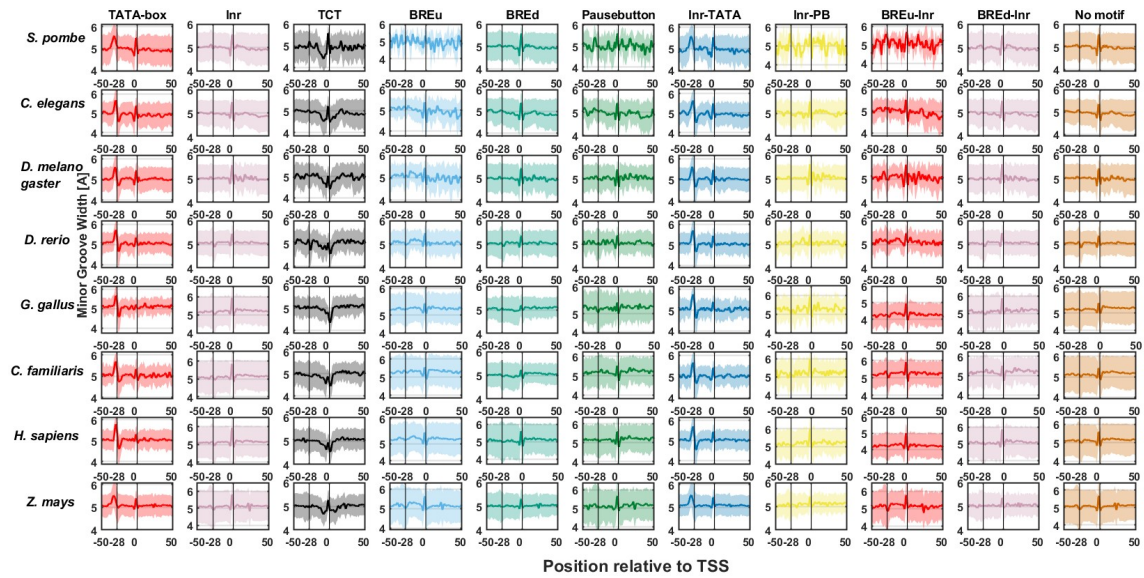


Figure S2: DNA shape (minor groove width) signals in promoter classes of eukaryotes. The property minor groove width has been shown for eleven promoter classes, TATA-box, Inr, TCT, BREu, BREd, Pause button(PB), Inr-TATA, Inr-PB, BREu-Inr, BREd-Inr, and No motif for eight eukaryotes.

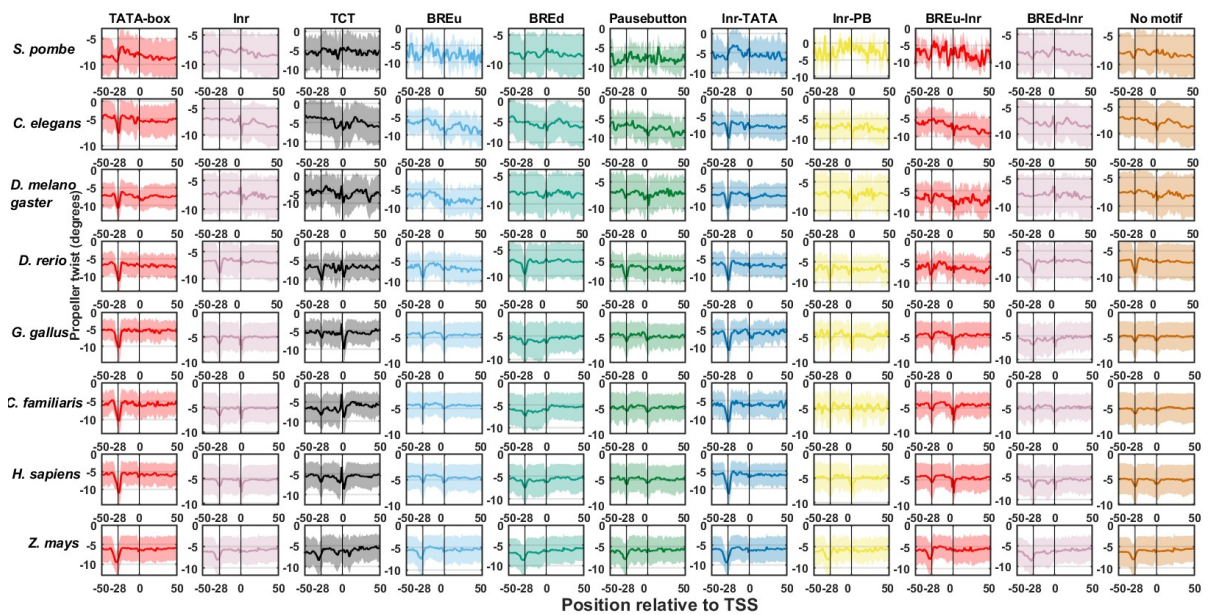


Figure S3: DNA shape (propeller twist) signals in promoter classes of eukaryotes. The property propeller twist has been shown for eleven promoter classes, TATA-box, Inr, TCT, BREu, BREd, Pausebutton, Inr-TATA, Inr-PB, BREu-Inr, BREd-Inr and No motif of eight eukaryotes.

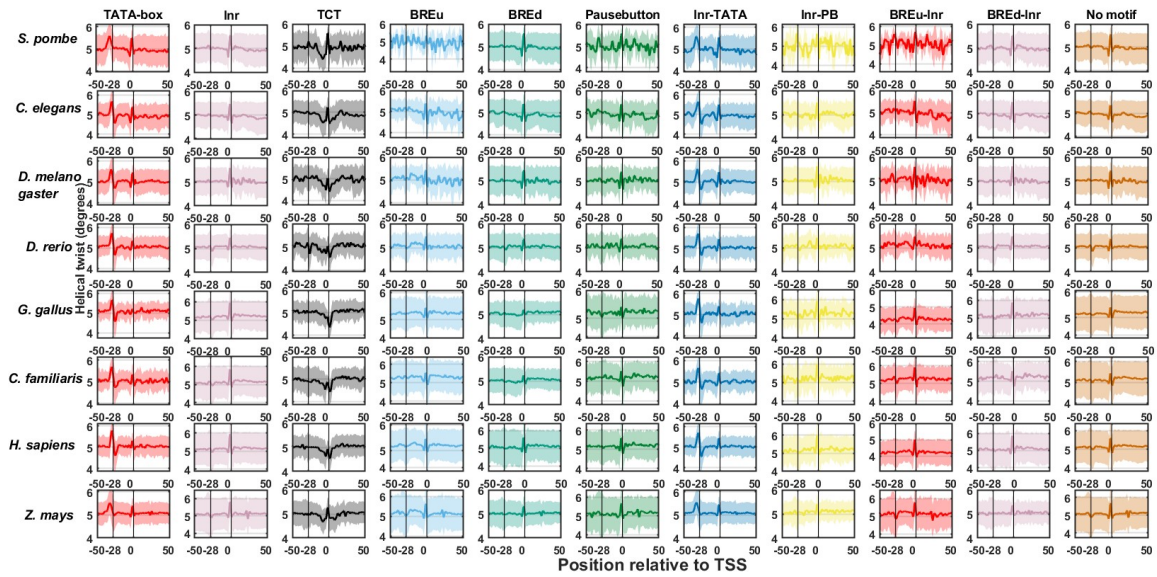


Figure S4: DNA shape (helical twist) signals in promoter classes of eukaryotes. The property helical twist has been shown for eleven promoter classes, TATA-box, Inr, TCT, BREu, BREd, Pause button, Inr-TATA, Inr-PB, BREu-Inr, BREd-Inr, and No motif of eight eukaryotes.

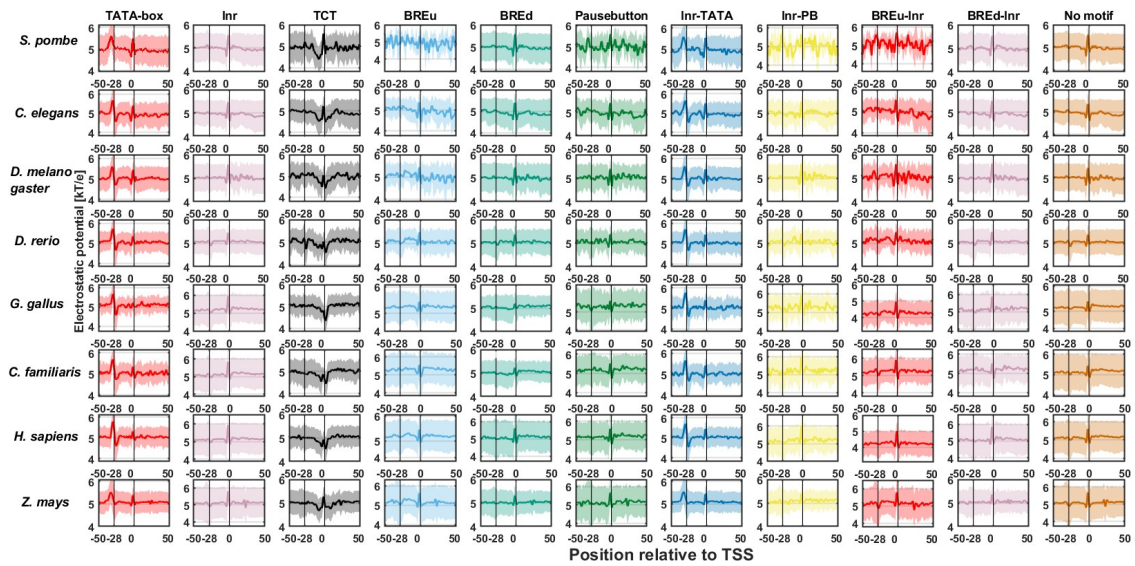


Figure S5: DNA shape (electrostatic potential) signals in promoter classes of eukaryotes. The property electrostatic potential has been shown for eleven promoter classes TATA-box, Inr, TCT, BREu, BREd, Pause button, Inr-TATA, Inr-PB, BREu-Inr, BREd-Inr, and No motif of eight eukaryotes.

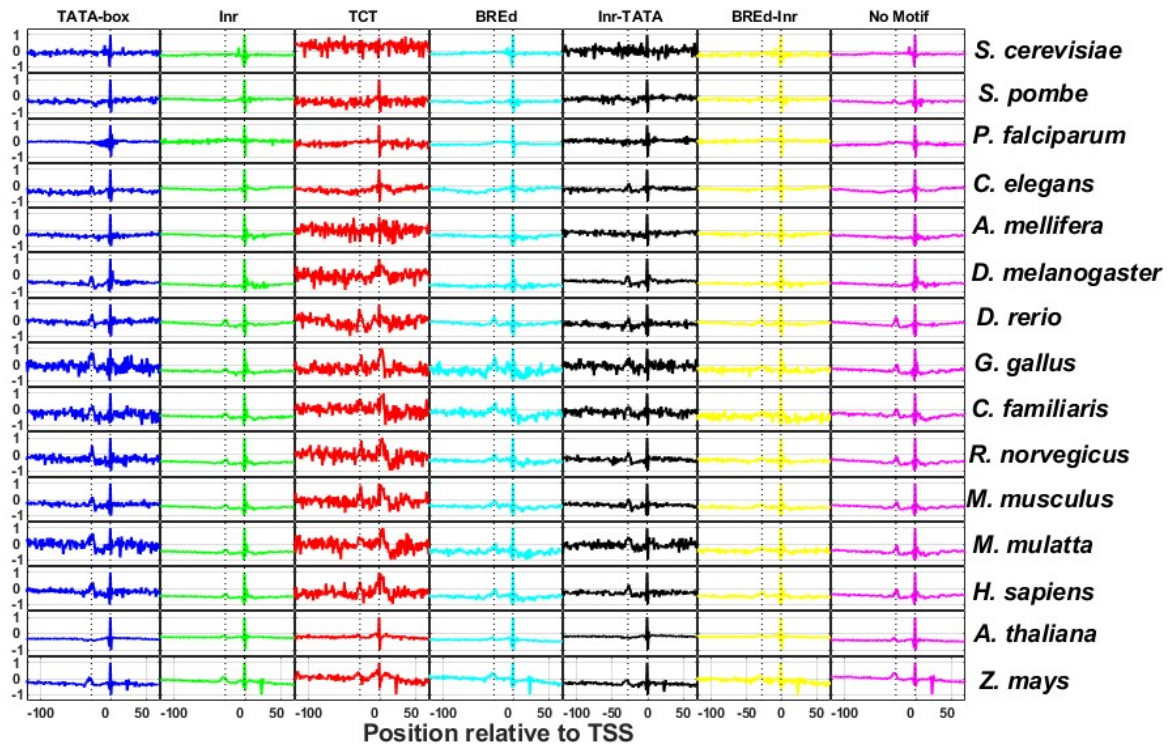


Figure S6: DNA mechanical stability profiles of TATA-Box, Inr, TCT, BREd, Inr-TATA, BREd-Inr, and no motif classes for 15 species. The X-axis in all subplots ranges from -100 to +50 with TSS being positioned at “0”. For comparative analysis, the Y-axis has been scaled from -1 to +1.

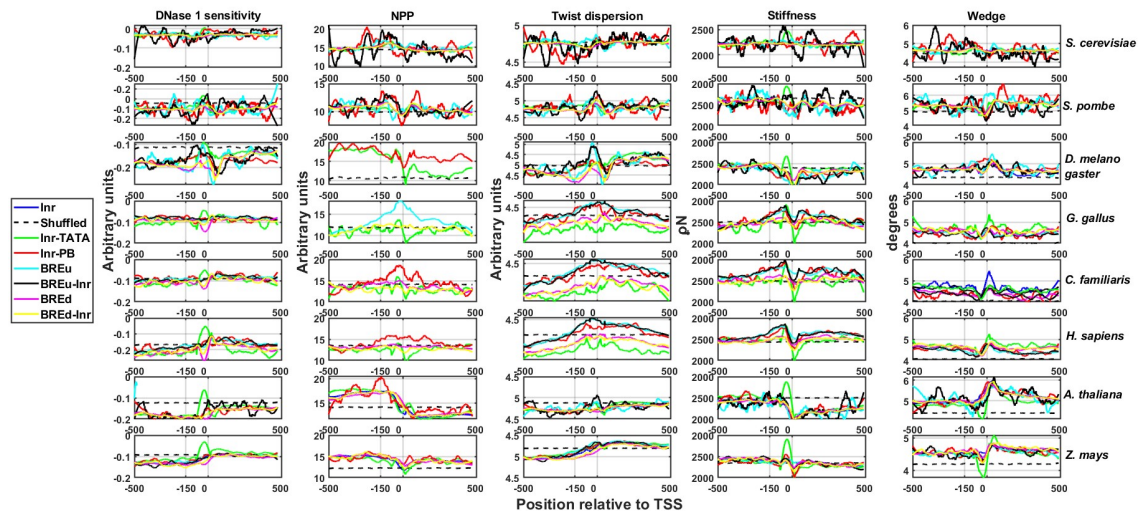


Figure S7: DNA flexibility profiles of *S. cerevisiae*, *S. pombe*, *D. melanogaster*, *Gallus gallus*, *C. familiaris*, Human, *A. thaliana*, and *Zea mays*. Different structural properties, bending flexibility (DNase 1 sensitivity and nucleosome positioning preference model), twisting flexibility (twist dispersion model), stretching stiffness, and wedge was calculated for promoter classes, Inr, Shuffled no motif, Inr-TATA, Inr-PB, BREu, BREu-Inr, BREd and BREd-Inr.

