

```
>Hnf4a
  A   C   G   T
1: -0.46 0.59 -0.78 0.66
2: -0.88 1.62 -1.57 0.82
3: -0.32 4.21 -3.19 -0.71
4:  0.42 4.90 -2.01 -3.31
5:  0.43 -1.17 0.89 -0.15
6: -0.56 -0.85 0.23 1.19
7: -0.84 0.51 -0.04 0.36
8: -0.21 -0.02 0.23 -0.01
```

**Figure S1** Energy PWM for Hnf4a from BEEML-PBM analysis

```
>Hnf4a-di4.5
1: -0.30  0.37 -0.55  0.48
2: -0.94  1.19 -1.23  0.98
3:  0.73  2.37 -2.72 -0.39
4:  0.59  2.08 -1.15 -1.53
5: -0.03  0.27  0.33 -0.58
6:  0.47 -1.64  0.84  0.33
7: -1.57  1.33 -0.64  0.87
8: -0.29 -0.02  0.25  0.06
4,5: -0.14  0.30  0.35 -0.51 -0.91  0.34 -0.40  0.97  0.84  0.66 -0.68 -0.81
0.21 -1.29  0.72  0.36
```

**Figure S2** Energy model for Hnf4a including di-nucleotide interactions between positions 4 and 5.

```

>Hnf4a-primary   Seed k-mer: GGGGTCAA   Enrichment Score: 0.494711
1:   -0.71    0.88   -2.53    2.36
2:   -1.66    2.44   -3.46    2.68
3:    1.25    2.78   -4.40    0.37
4:    1.67    3.52   -3.64   -1.55
5:    1.54    2.41    0.06   -4.01
6:    2.25   -3.94    1.62    0.07
7:   -2.89   -0.61    0.63    2.87
8:   -1.60    0.33    0.58    0.68

>Hnf4a-secondary Seed k-mer: AAAGTCCA   Enrichment Score: 0.496885
1:   -2.55    1.67    0.59    0.29
2:   -2.12    1.62   -0.61    1.11
3:   -3.57    2.32   -0.44    1.69
4:    1.27    1.86   -4.60    0.93
5:    1.41    2.16    0.42   -3.98
6:    0.51   -3.55    1.97    1.06
7:    2.01   -3.98    1.35    0.62
8:   -3.15    2.49   -0.93    1.59

```

**Figure S3** Primary and secondary PWMs from UniProbe database.