Supplementary Figure Legends

Figure S1, related to Figure 1. Biochemical characterization of the minimal MRG-binding domain of MRGBP. (**A**) A cartoon representation of the predicted secondary structural elements in MRGBP. Also shown are the constructs used for the studies below and the approximate location of the FxLP motif. (**B**) Chromatograms from SEC experiments conducted using a Superdex 75 column with co-purified MRGBP and MRG15 MRG proteins. These assays were conducted with MRGBP$^{32-119}$ (*left panel*) and MRGBP$^{69-119}$ (*right panel*) constructs. Proteins in individual fractions were resolved by SDS-PAGE and detected by Coomassie staining.

Figure S2, related to Figure 1. Solution NMR spectra of MRGBP MBD and MRG15 MRG establishing a direct interaction between the proteins. ^{1}H-^{15}N correlated spectra of ^{15}N-MRGBP MBD recorded in the absence (*black*) and presence (*red*) of one equivalent of unlabeled MRG15 MRG (*left panel*) and that of ^{15}N-MRG15 MRG recorded in the absence (*black*) and presence (*red*) of one equivalent of MRGBP MBD (*right panel*). The spectra were recorded at 35 °C under the same solution conditions.

Figure S3, related to Figure 2. A MONSTER-derived catalog of non-covalent interactions in the MRG15 MRG-MRGBP MBD complex. MRG15 residues are shown in blue while the MRGBP residues are shown in magenta. The gray, green, red, and purple lines denote hydrophobic, electrostatic, hydrogen bonding, and salt-bridge interactions, respectively. Only those interactions consistently found in a majority of conformers (>50%) in the ensemble are shown.

Figure S4, related to Figure 4. PALB2 MBD$^{579-629}$ binds MRG15 MRG with high affinity. A representative binding isotherm from titrations of PALB2 MBD (in the syringe) with MRG15 MRG (in the cell). The concentrations were 200 and 20 μM, respectively, and the experiments were conducted at 25 °C.

Supplementary Table Legend

Table S1, related to Figure 3. Equilibrium dissociation constants for various MRG complexes.

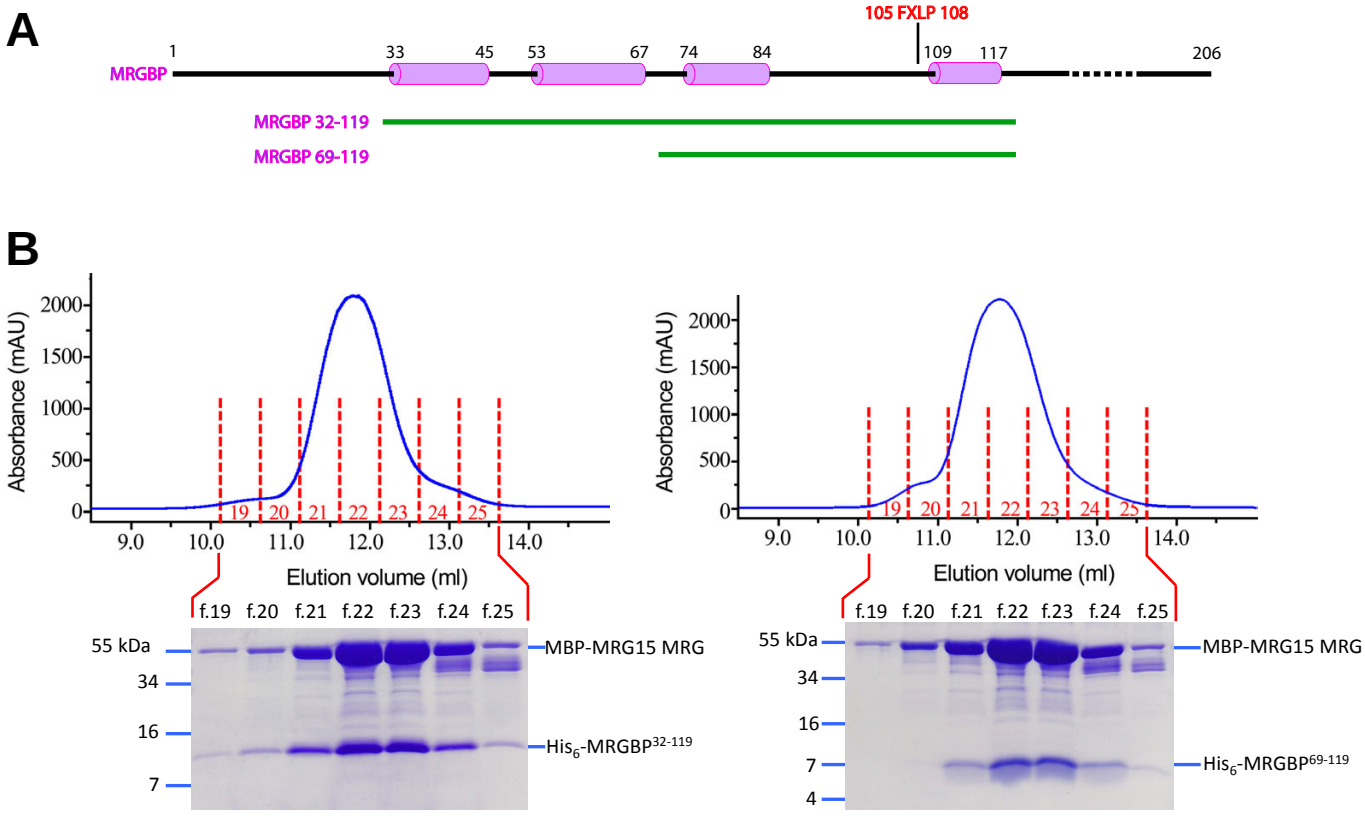

A
105 FXLP 108
1
33
45
53
67
74
84
109
117
206
MRGBP
MRGBP 32-119
MRGBP 69-119
B
Absorbance (mAU)
2000
1500
1000
500
0
9.0
10.0
11.0
12.0
13.0
14.0
Elution volume (ml)
19
20
21
22
23
24
25
f.19
f.20
f.21
f.22
f.23
f.24
f.25
55 kDa
34
16
7
4
MBP-MRG15 MRG
His6-MRGBP32-119
His6-MRGBP69-119

Figure S1

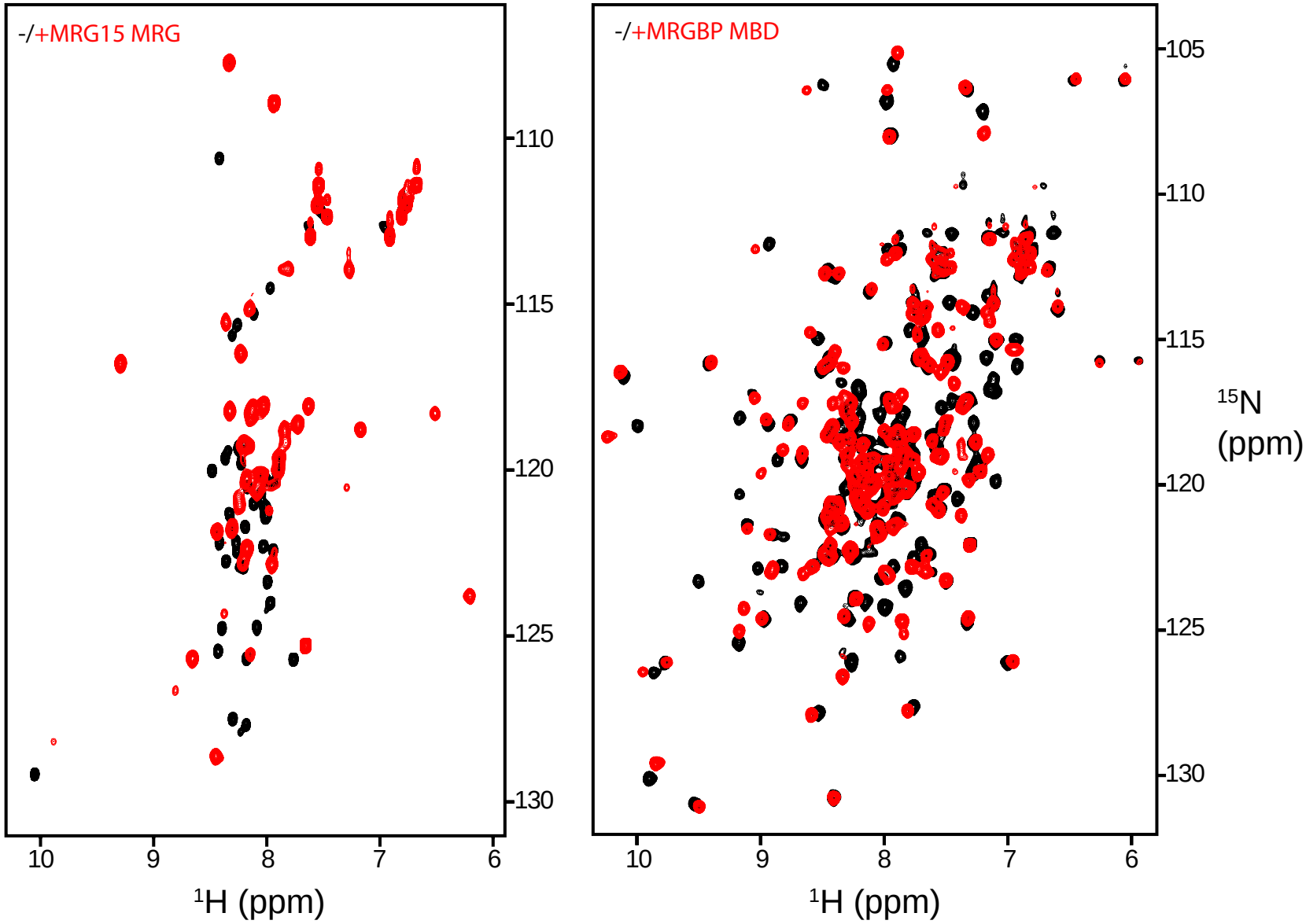
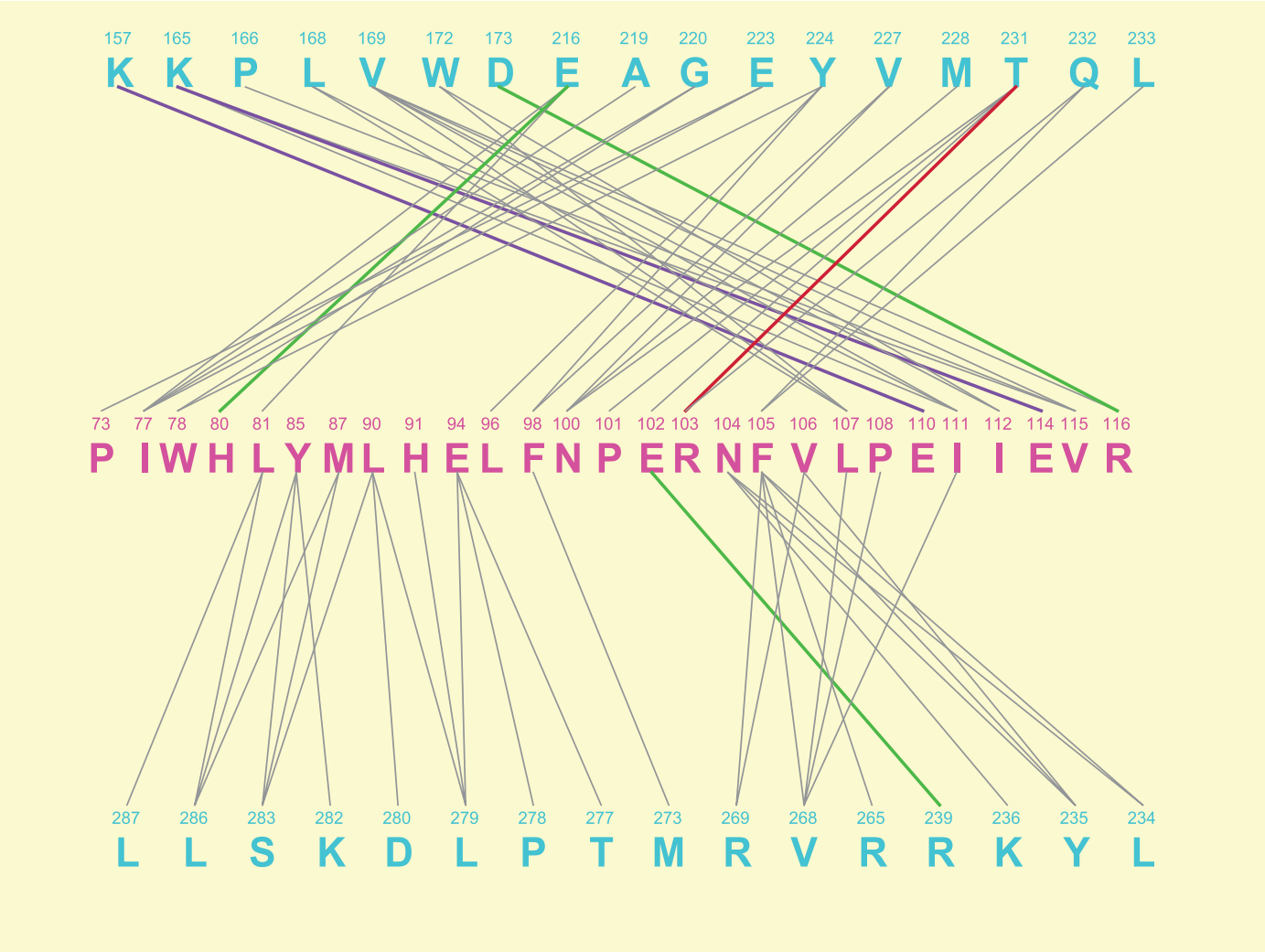

-/+MRG15 MRG
-/+MRGBP MBD
110
115
120
125
130
105
110
115
120
125
130
10
9
8
7
6
10
9
8
7
6
^{1}H (ppm)
^{1}H (ppm)
^{15}N (ppm)

Figure S2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K K P L V W D E A G E Y V M T Q L
73 77 78 80 81 85 87 90 91 94 96 98 100 101 102 103 104 105 106 107 108 110 111 112 114 115 116
P I W H L Y M L H E L F N P E R N F V L P E I I E V R
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L L S K D L P T M R V R R K Y L

Figure S3

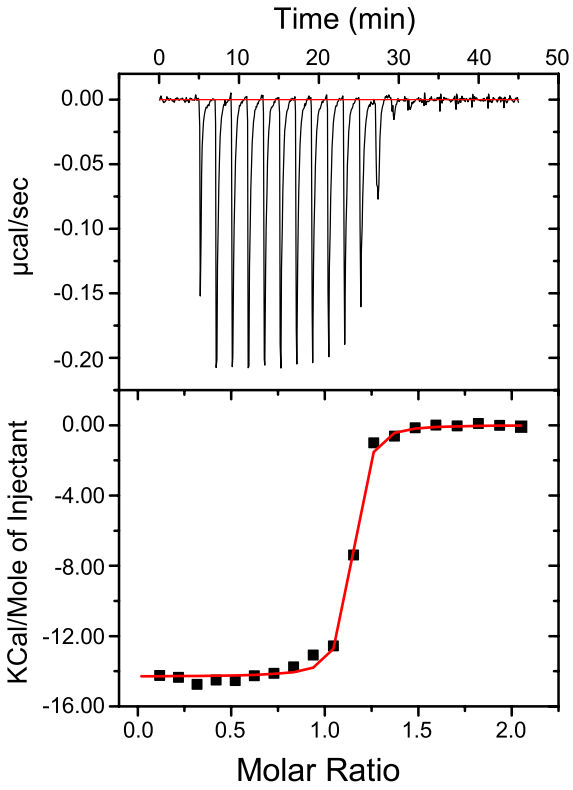
Time (min)
0
10
20
30
40
50
0.00
-0.05
-0.10
-0.15
-0.20
µcal/sec
0.00
-4.00
-8.00
-12.00
-16.00
KCal/Mole of Injectant
0.0
0.5
1.0
1.5
2.0
Molar Ratio

Figure S4

Table S1, related to Figure 3. Equilibrium Dissociation Constants for Various MRG Complexes

Reactants	K_d (μM)
MRG15 MRG + MRGBP MBD	0.058 ± 0.009
MRG15 MRG + MRGBP MBD W78A	–[a]
MRG15 MRG + MRGBP MBD M84A	0.151 ± 0.048[b]
MRG15 MRG + MRGBP MBD F105A	–[a]
MRG15 MRG + MRGBP MBD I112A	0.750 ± 0.210
MRGBP MBD + MRG15 MRG L168A	0.526 ± 0.080[b]
MRGBP MBD + MRG15 MRG W172A	0.424 ± 0.041
MRGBP MBD + MRG15 MRG M273A	0.068 ± 0.016
MRGBP MBD + MRG15 MRG L287A	0.133 ± 0.025
MRG15 MRG + PALB2 MBD	0.022 ± 0.004

[a]: could not be reliably quantified due to poor binding

[b]: average values from two independent measurements; all others from three independent measurements