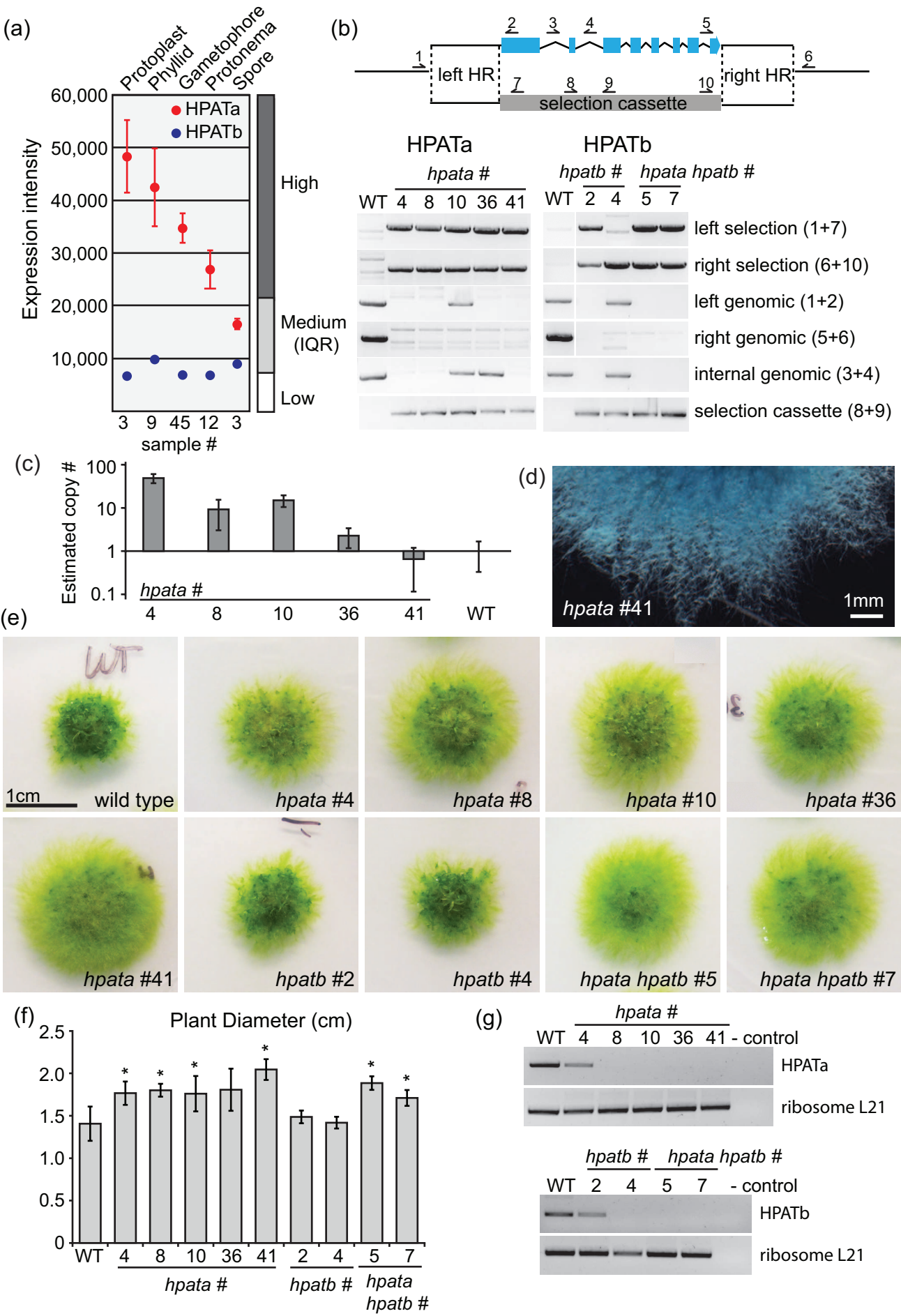
(a)
Protoplast
Phyllid
Gametophore
Protonema
Spore
60,000
50,000
40,000
30,000
20,000
10,000
Expression intensity
HPATa
HPATb
High
Medium
(IQR)
Low
3 9 45 12 3
sample #
(b)
1
2
3
4
5
6
7
8
9
10
left HR
right HR
selection cassette
HPATa
HPATb
hpata #
hpatb #
hpata hpatb #
WT 4 8 10 36 41
WT 2 4 5 7
left selection (1+7)
right selection (6+10)
left genomic (1+2)
right genomic (5+6)
internal genomic (3+4)
selection cassette (8+9)
(c)
Estimated copy #
100
10
1
0.1
hpata #
4 8 10 36 41 WT
(d)
hpata #41
1mm
(e)
1cm
wild type
hpata #4
hpata #8
hpata #10
hpata #36
hpata #41
hpatb #2
hpatb #4
hpata hpatb #5
hpata hpatb #7
(f)
Plant Diameter (cm)
2.5
2.0
1.5
1.0
0.5
0
WT 4 8 10 36 41 2 4 5 7
hpata #
hpatb #
hpata hpatb #
(g)
hpata #
WT 4 8 10 36 41 - control
HPATa
ribosome L21
hpatb # hpata hpatb #
WT 2 4 5 7 - control
HPATb
ribosome L21