

Root straight-line length from top to tip (cm)

8
6
4
2
0

straightLen: Root straight-line length from top to tip

FDR threshold
*** $p < 0.001$
** $p < 0.01$
* $p < 0.05$

PENN ***

IL7-5
IL2-3
IL1-1
IL2-4
IL6-1
IL7-4-1
IL9-3-1
IL2-2
IL8-2-1
IL12-3
IL9-3
IL7-5-P75
IL7-4
IL5-3
IL4-1
IL1-1-2
IL8-3-1
IL1-1-3
IL11-2
IL2-1-1
IL9-2-6
IL11-1
IL8-1-1
IL11-4
IL7-3
IL1-4-18
IL4-3-2
IL4-3
IL4-2
IL7-5-5
IL12-1-1
IL1-1-4
IL5-5
IL5-2
IL1-3
IL6-2
IL2-6-5
IL3-4
IL12-4
IL6-3
IL5-1
IL8-2
IL10-3
IL2-1
IL9-1
IL9-3-2
IL11-3
IL12-3-1
IL8-1
IL7-5-P5
IL3-1
IL10-2
IL6-4
IL3-5
IL10-2-2
IL3-2
IL2-5
IL12-1
IL10-1
IL7-1
IL1-4
IL5-4
IL8-1-5
IL8-3
M82
IL4-4
IL9-1-2
IL7-5-1
IL9-1-3
IL10-1-1
IL12-4-1
IL9-2-5
IL7-2
IL11-4-1
IL9-2
IL12-2
IL2-6

Root length from top to tip (cm)

10
8
6
4
2
0

rootLen: Root length from top to tip

FDR threshold
*** p < 0.001
** p < 0.01
* p < 0.05

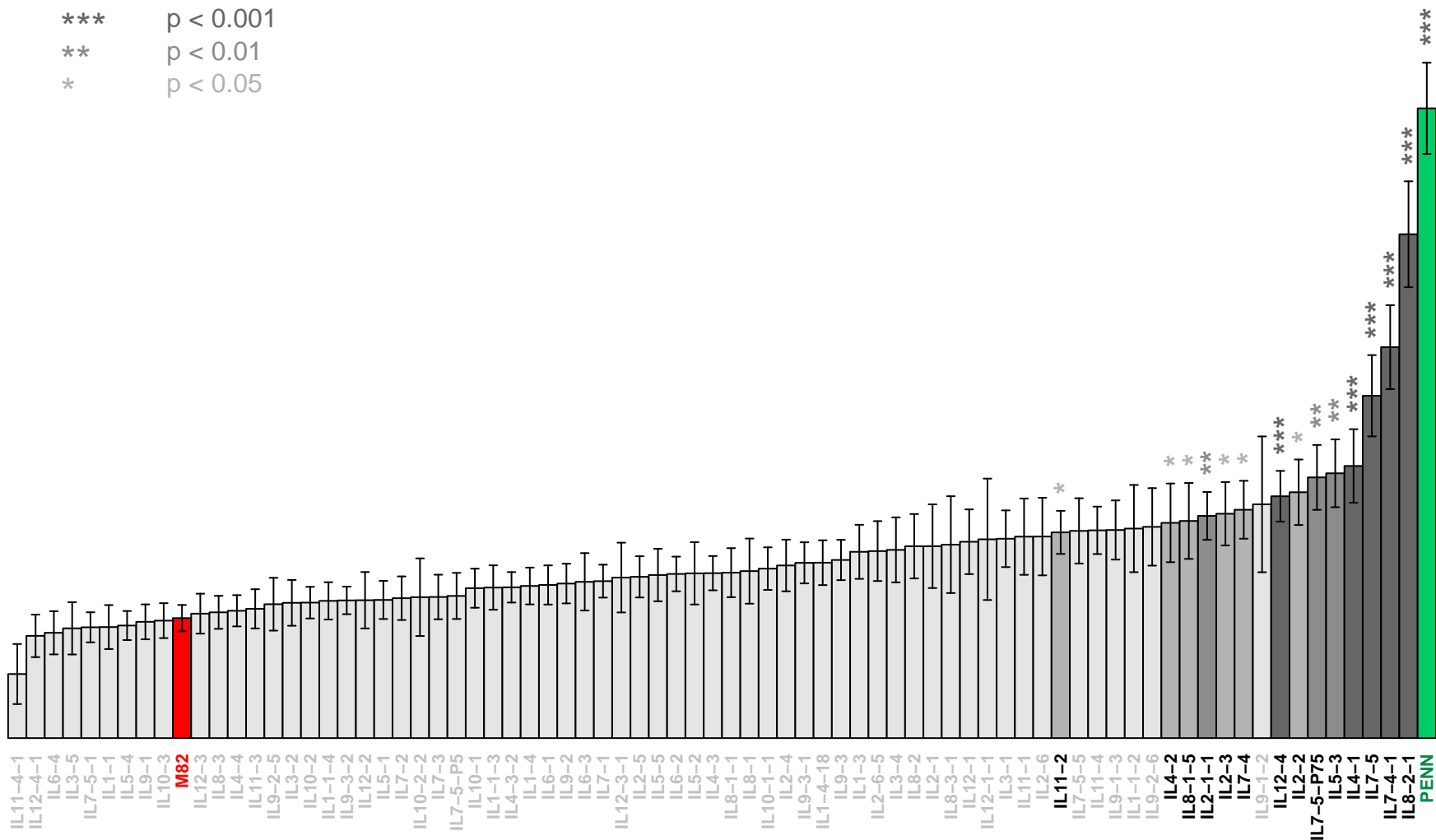
PENN
IL2-3
IL7-5
IL1-1
IL2-4
IL9-3-1
IL6-1
IL2-2
IL7-4-1
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IL12-3
IL9-3
IL5-3
IL1-1-3
IL7-5-P75
IL7-4
IL9-2-6
IL1-1-2
IL2-1-1
IL11-2
IL4-1
IL8-3-1
IL4-3
IL4-3-2
IL8-1-1
IL7-3
IL4-2
IL6-2
IL1-3
IL11-4
IL1-4-18
IL11-1
IL1-1-4
IL2-6-5
IL3-4
IL5-1
IL6-3
IL5-5
IL12-3-1
IL2-1
IL9-1
IL10-3
IL5-2
IL7-5-5
IL12-4
IL8-2
IL10-2
IL3-5
IL9-3-2
IL7-5-P5
IL11-3
IL2-5
IL10-2-2
IL10-1
IL5-4
IL3-1
IL1-4
IL12-1
IL6-4
IL8-1
IL4-4
IL9-1-2
M82
IL8-3
IL12-1-1
IL7-5-1
IL7-1
IL8-1-5
IL3-2
IL10-1-1
IL9-2-5
IL7-2
IL12-2
IL11-4-1
IL9-1-3
IL12-4-1
IL2-6
IL9-2

Angle of tip of root (degrees)

50
40
30
20
10
0

tipAng: Angle of tip of root

FDR threshold
*** p < 0.001
** p < 0.01
* p < 0.05



Average of absolute value of angle along entire root (degrees)

avgAbsAng: Average of absolute value of angle along entire root

FDR threshold
*** p < 0.001
** p < 0.01
* p < 0.05

60
50
40
30
20
10
0

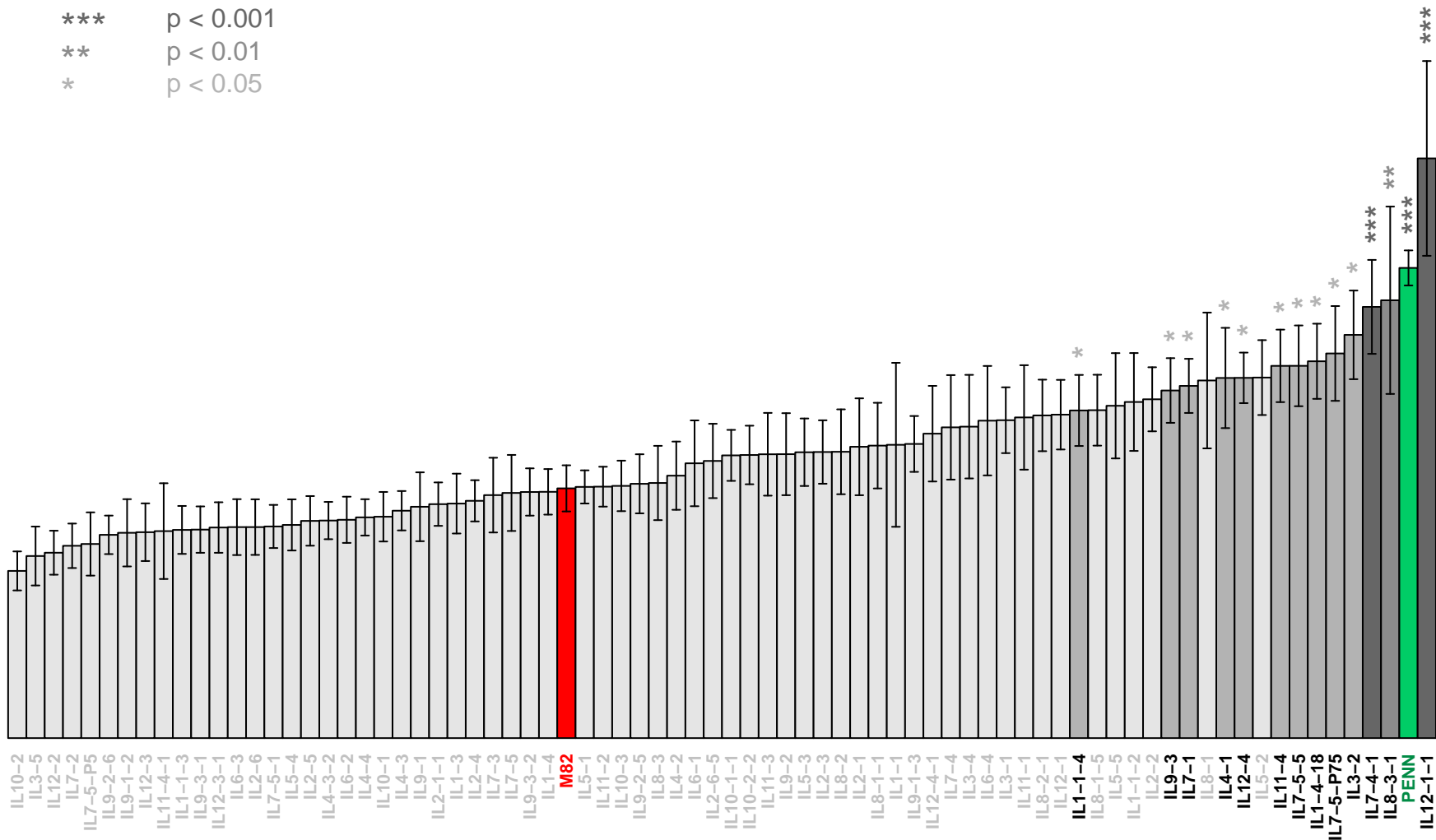
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IL11-4-1
IL3-5
IL12-2
IL7-2
IL5-4
IL7-5-1
IL12-3
IL7-5-P5
IL12-3-1
IL4-4
IL4-3-2
IL1-1-3
IL10-1
IL10-3
IL6-3
M82
IL9-3-2
IL12-4-1
IL8-3
IL6-2
IL2-6
IL9-2-6
IL5-1
IL9-1
IL2-5
IL1-4
IL1-3
IL9-3-1
IL9-2
IL11-3
IL4-3
IL2-1-1
IL9-1-2
IL9-2-5
IL11-2
IL7-3
IL10-2-2
IL2-4
IL6-4
IL2-6-5
IL1-1
IL6-1
IL2-1
IL4-2
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IL9-1-3
IL1-1-4
IL8-2
IL3-4
IL8-1-5
IL7-1
IL5-2
IL5-5
IL3-1
IL8-1
IL9-3
IL12-1
IL2-3
IL7-4
IL3-2
IL5-3
IL1-4-18
IL7-5
IL1-1-2
IL7-5-5
IL4-1
IL12-4
IL2-2
IL7-5-P75
IL8-3-1
IL11-4
IL8-2-1
IL12-1-1
IL7-4-1
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Average of absolute value of angle along first third root (degrees)

0 20 40 60 80 100

first3rdAng: Average of absolute value of angle along first third root

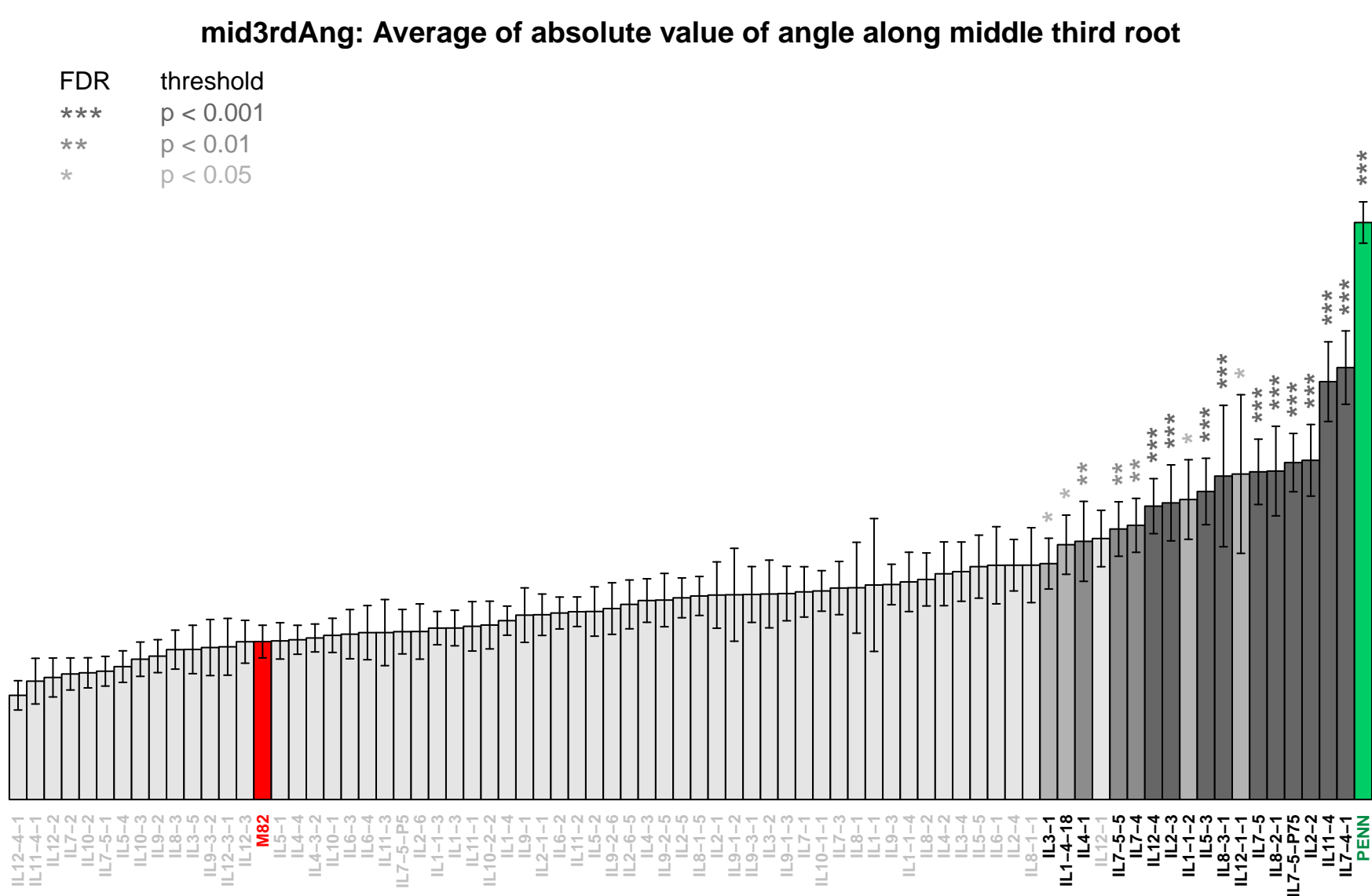
FDR threshold
*** p < 0.001
** p < 0.01
* p < 0.05



Average of absolute value of angle along middle third root (degrees)

mid3rdAng: Average of absolute value of angle along middle third root

FDR threshold
*** $p < 0.001$
** $p < 0.01$
* $p < 0.05$



Average of absolute value of angle along last third root (degrees)

last3rdAng: Average of absolute value of angle along last third root

FDR threshold
*** p < 0.001
** p < 0.01
* p < 0.05

50
40
30
20
10
0

IL11-4-1
IL12-4-1
IL5-4
IL11-3
M82
IL12-3
IL10-3
IL3-5
IL10-2
IL1-1
IL7-5-1
IL4-4
IL9-3-2
IL6-4
IL8-3
IL10-1
IL9-2
IL4-3-2
IL1-1-4
IL9-2-5
IL7-2
IL5-1
IL1-4
IL7-1
IL7-5-P5
IL3-2
IL1-1-3
IL6-1
IL12-2
IL12-3-1
IL8-1
IL9-1
IL6-2
IL2-1
IL5-2
IL11-1
IL6-3
IL10-2-2
IL2-5
IL8-1-1
IL5-5
IL3-4
IL2-6-5
IL11-2
IL1-3
IL9-3
IL10-1-1
IL7-3
IL4-3
IL2-4
IL9-2-6
IL12-1
IL8-1-5
IL1-4-18
IL2-1-1
IL2-6
IL4-2
IL8-3-1
IL3-1
IL9-3-1
IL9-1-3
IL8-2
IL7-5-5
IL9-1-2
IL11-4
IL7-4
IL12-1-1
IL2-3
IL12-4
IL1-1-2
IL5-3
IL7-5-P75
IL2-2
IL4-1
IL7-5
IL7-4-1
IL8-2-1
PENN
