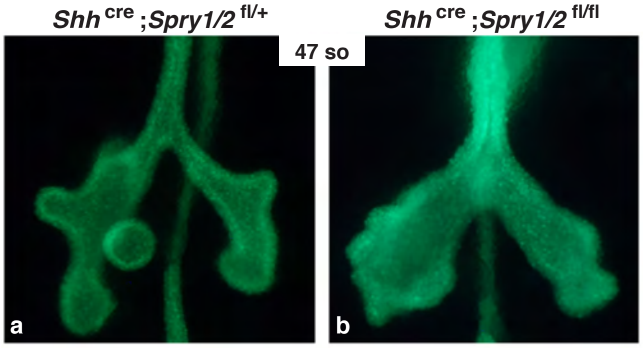
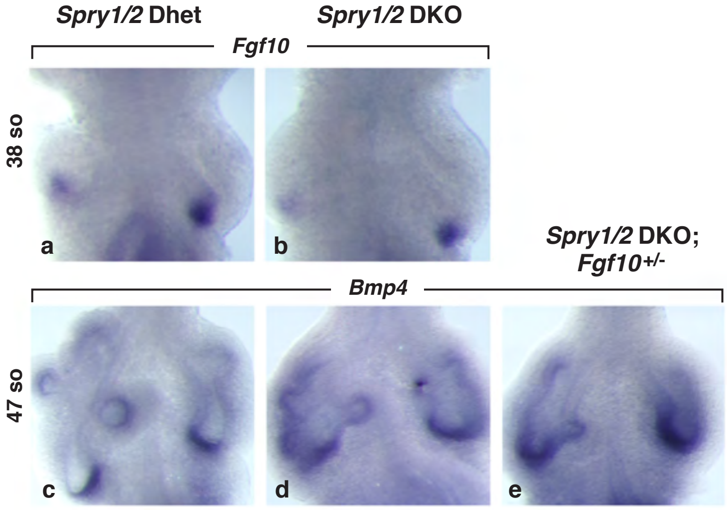
Supplementary Figure 1

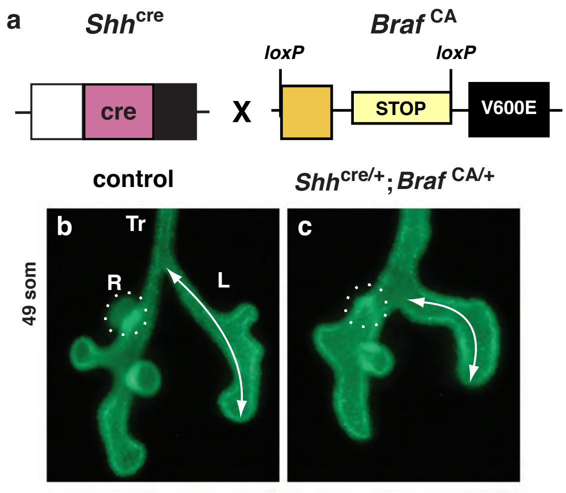


Shh^{cre};*Spry1/2*$^{fl/+}$
47 so
Shh^{cre};*Spry1/2*$^{fl/fl}$
a
b

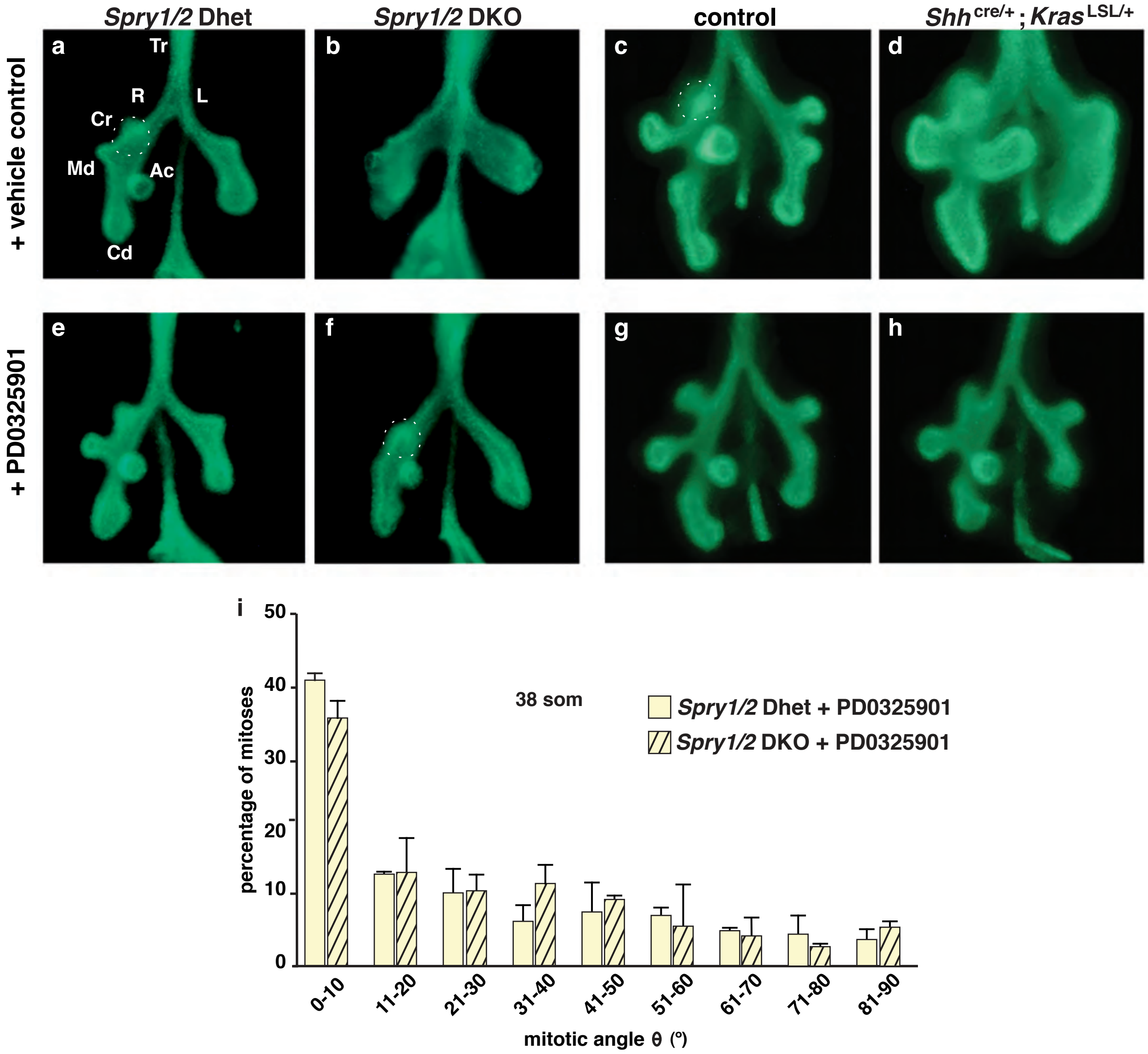
Supplementary Figure 2


Spry1/2 Dhet
Spry1/2 DKO
Fgf10
38 so
a
b
Spry1/2 DKO;
Fgf10+/-
Bmp4
47 so
c
d
e

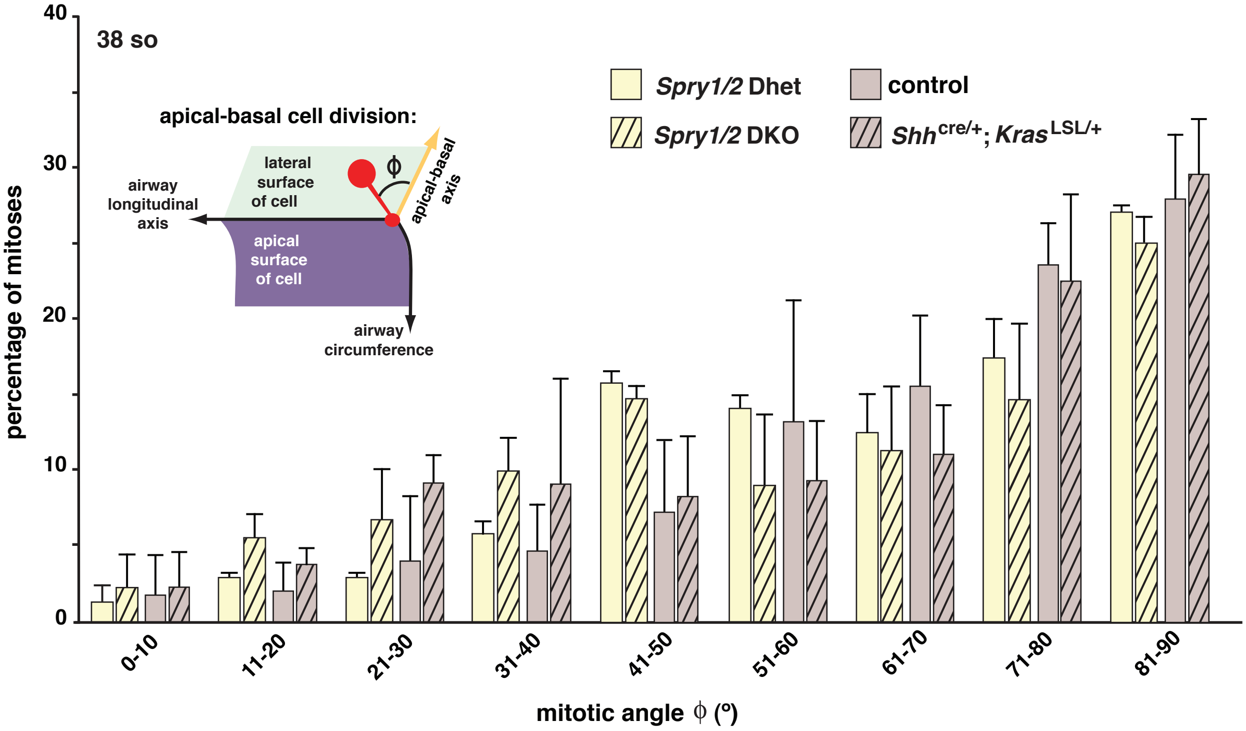
Supplementary Figure 3


a
Shhcre
Braf CA
loxP
loxP
cre
X
STOP
V600E
control
Shhcre/+; Braf CA/+
b
Tr
R
L
49 som
c

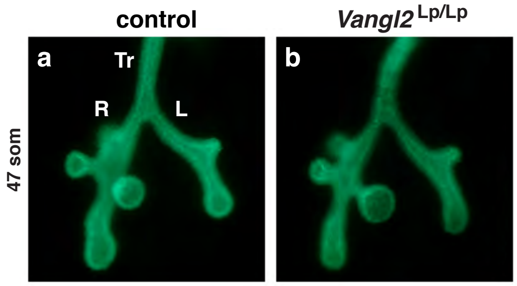
Supplementary Figure 4


Spry1/2 Dhet
Spry1/2 DKO
control
Shh cre/+ ; Kras LSL/+
+ vehicle control
+ PD0325901
a
Tr
R
L
Cr
Md
Ac
Cd
b
c
d
e
f
g
h
i
50
40
30
20
10
0
percentage of mitoses
38 som
Spry1/2 Dhet + PD0325901
Spry1/2 DKO + PD0325901
0-10
11-20
21-30
31-40
41-50
51-60
61-70
71-80
81-90
mitotic angle θ (°)

Supplementary Figure 5



Supplementary Figure 6


control
Vangl2 Lp/Lp
47 som
a
Tr
R
L
b