Figure S1

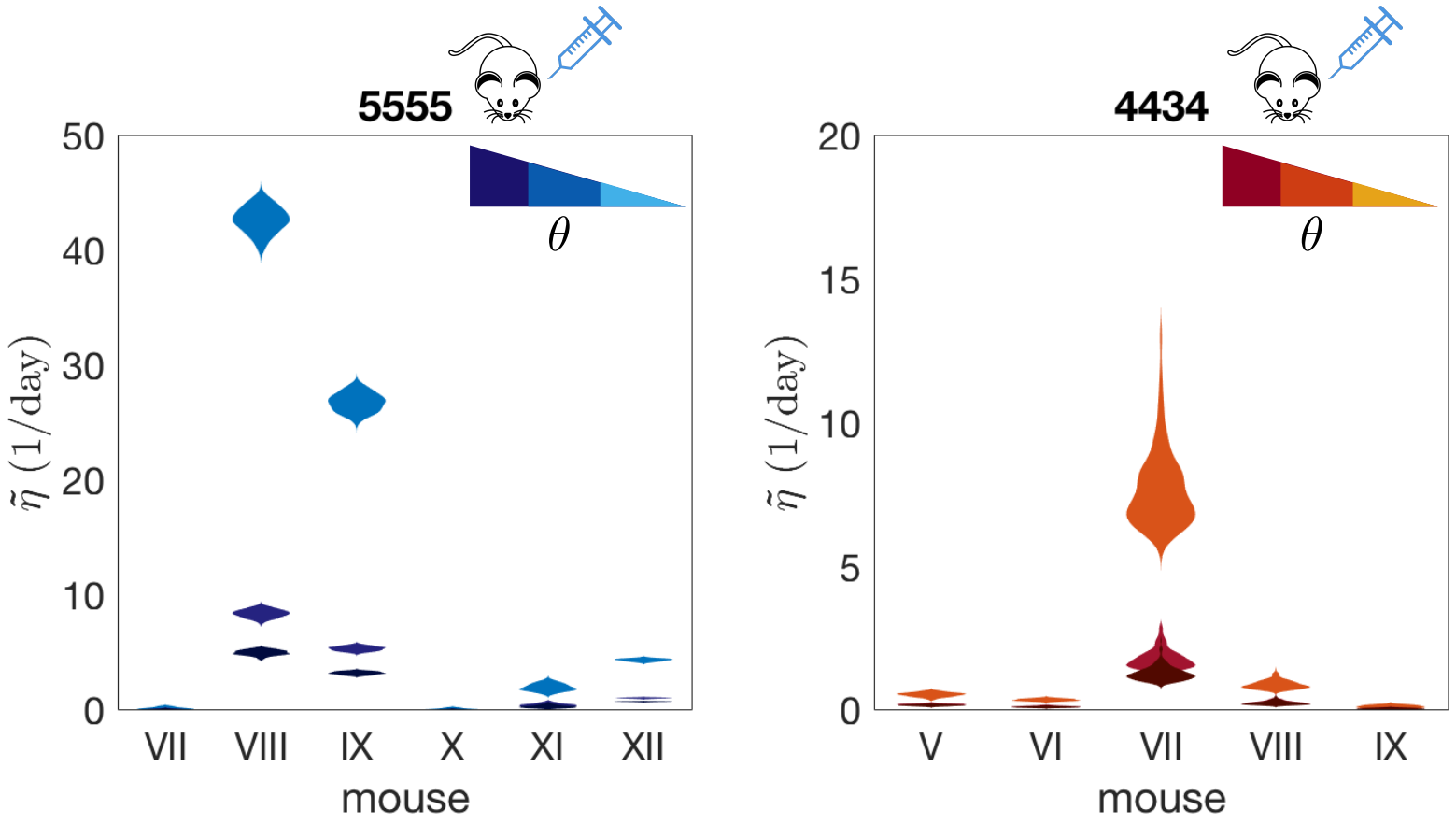

5555
50
40
30
20
10
0
$\tilde{\eta}$ (1/day)
θ
VII
VIII
IX
X
XI
XII
mouse
4434
20
15
10
5
0
$\tilde{\eta}$ (1/day)
θ
V
VI
VII
VIII
IX
mouse

Figure S2

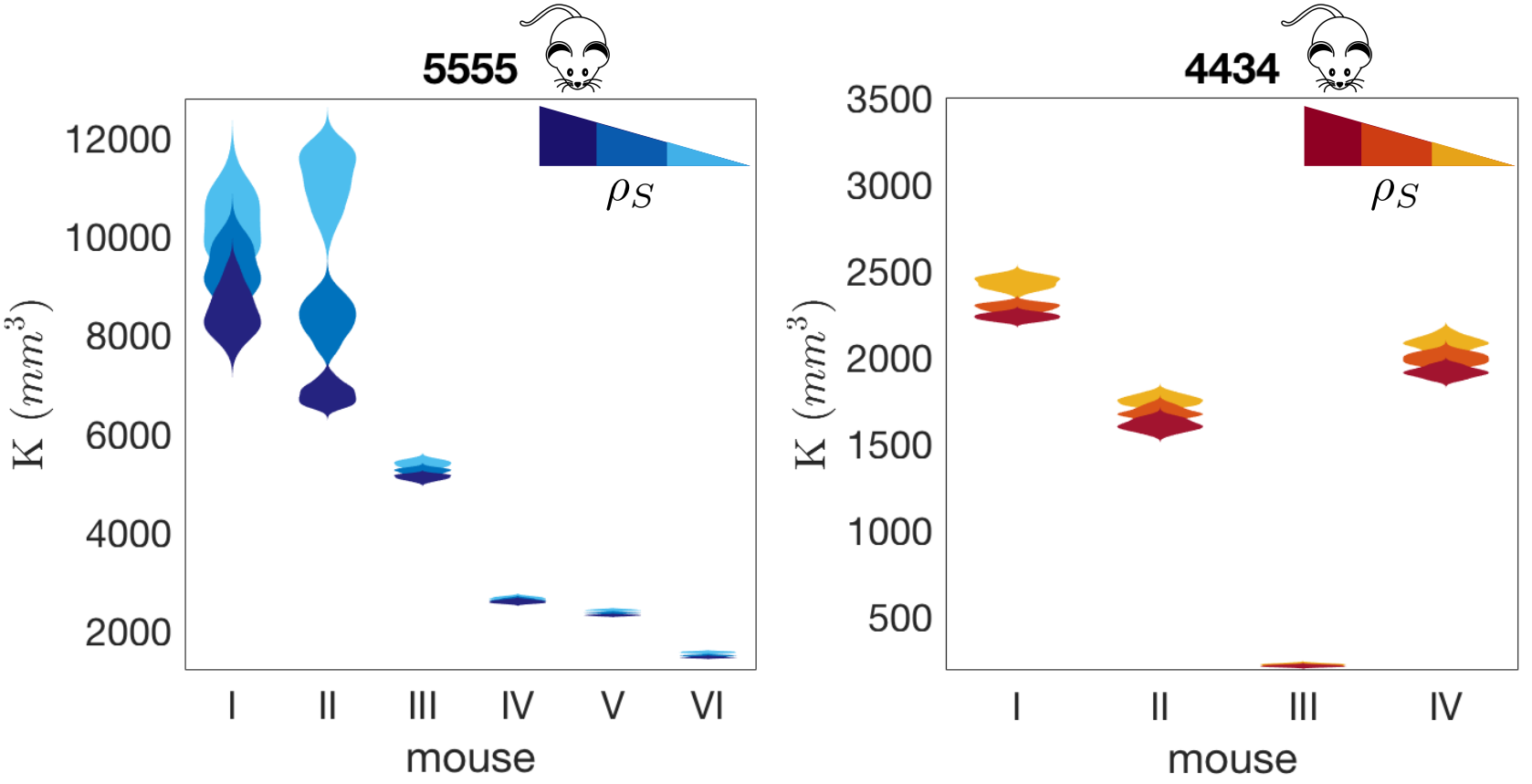

5555
12000
10000
8000
6000
4000
2000
K (mm^3)
ρ_S
I
II
III
IV
V
VI
mouse
4434
3500
3000
2500
2000
1500
1000
500
K (mm^3)
ρ_S
I
II
III
IV
mouse

Figure S3

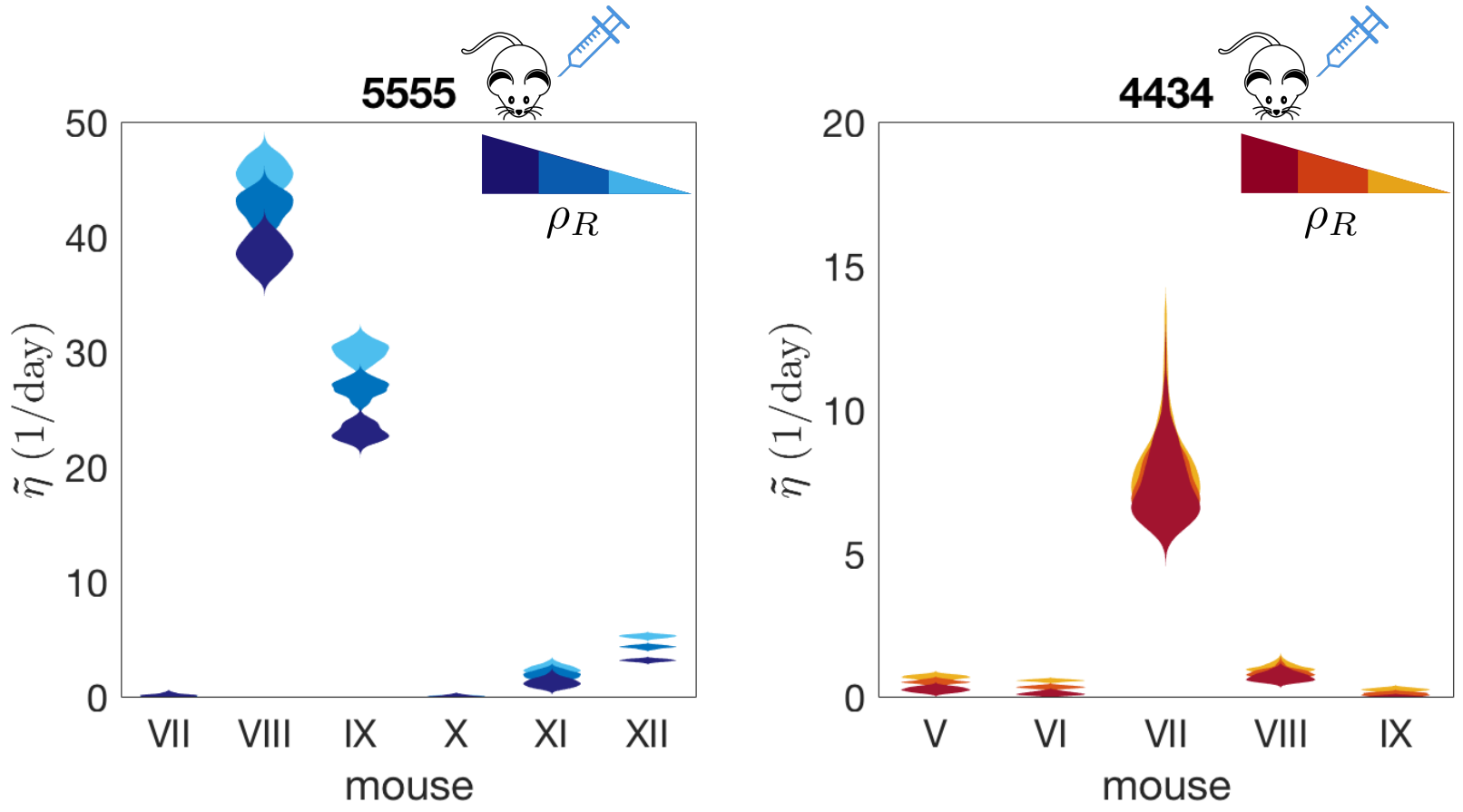

5555
50
40
30
20
10
0
$\tilde{\eta}$ (1/day)
ρ_R
VII
VIII
IX
X
XI
XII
mouse
4434
20
15
10
5
0
$\tilde{\eta}$ (1/day)
ρ_R
V
VI
VII
VIII
IX
mouse

Figure S4

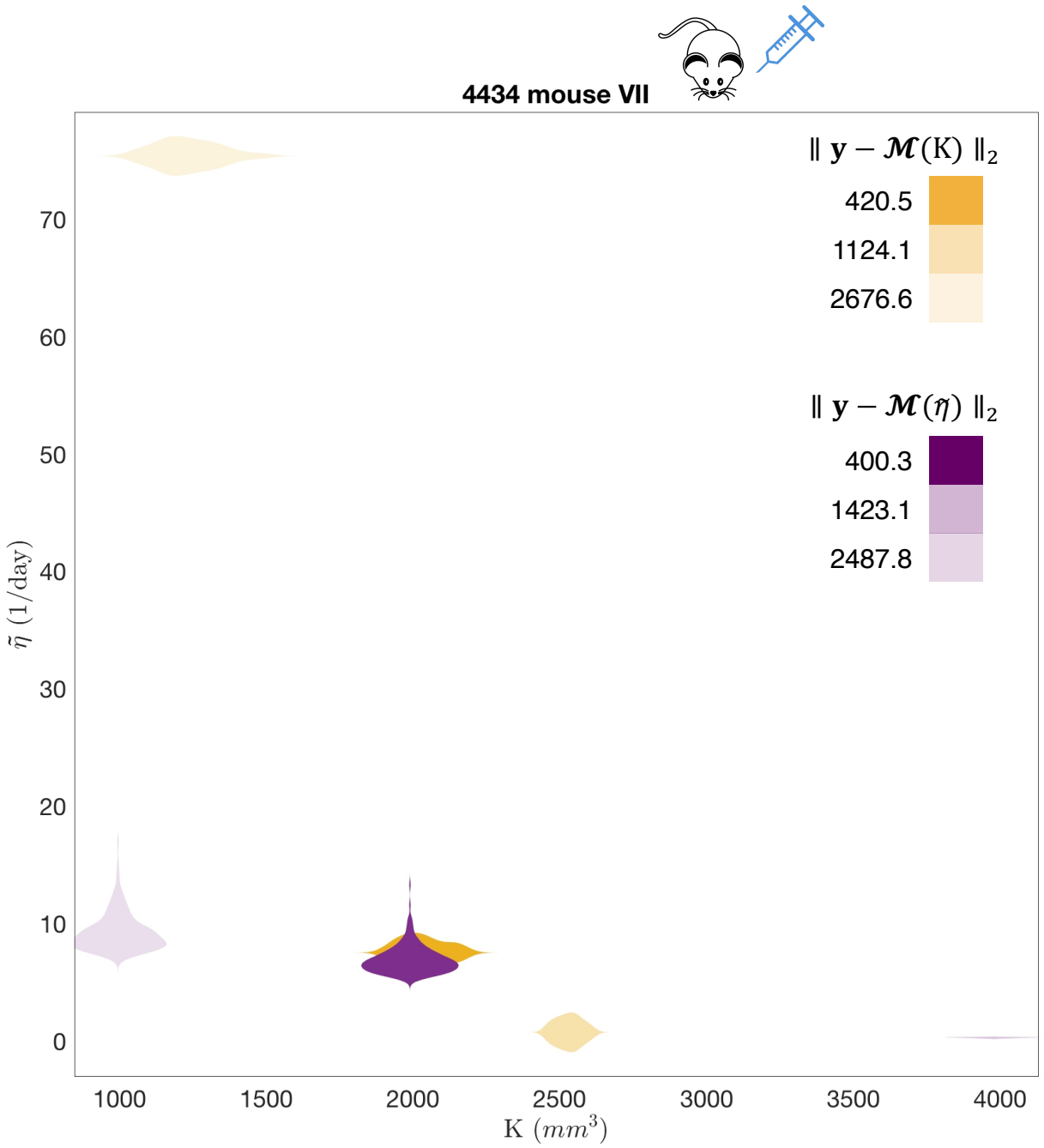

4434 mouse VII
$\| \mathbf{y} - \mathcal{M}(\mathrm{K}) \|_2$
420.5
1124.1
2676.6
$\| \mathbf{y} - \mathcal{M}(\tilde{\eta}) \|_2$
400.3
1423.1
2487.8
$\tilde{\eta}$ (1/day)
0
10
20
30
40
50
60
70
1000
1500
2000
2500
3000
3500
4000
K (mm^3)

Figure S5

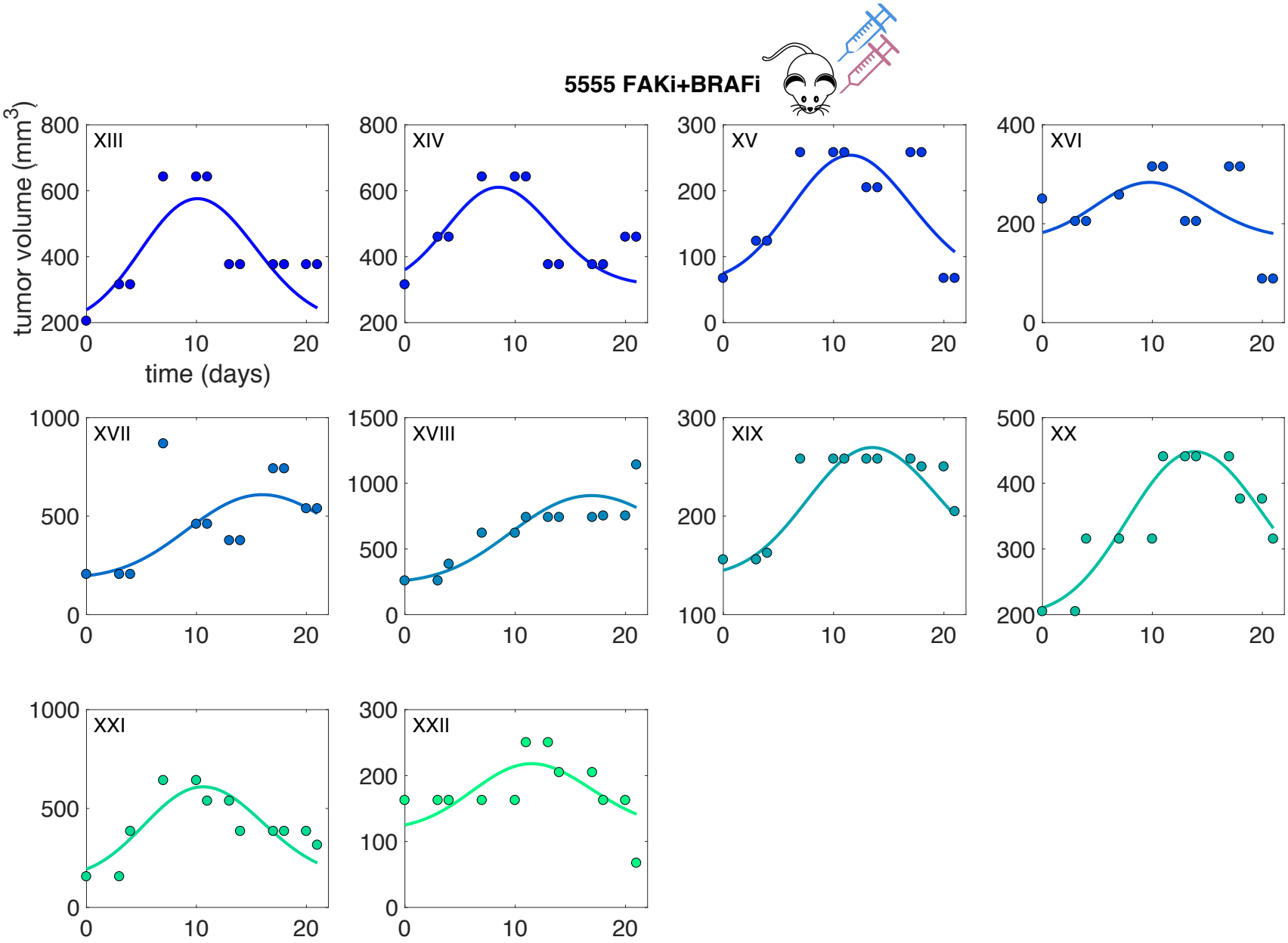

5555 FAKi+BRAFi
tumor volume (mm3)
time (days)
XIII
XIV
XV
XVI
XVII
XVIII
XIX
XX
XXI
XXII

Figure S6

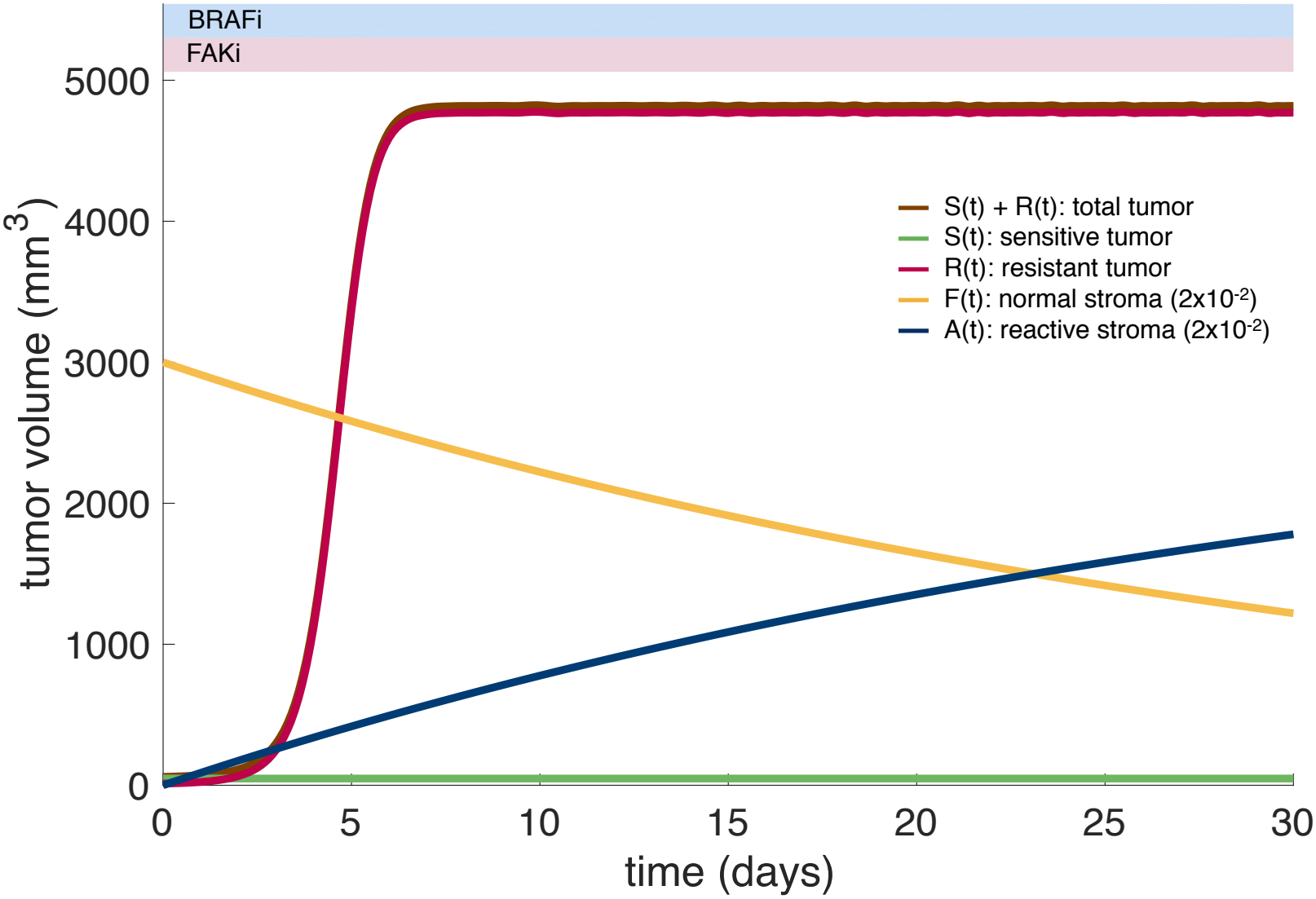
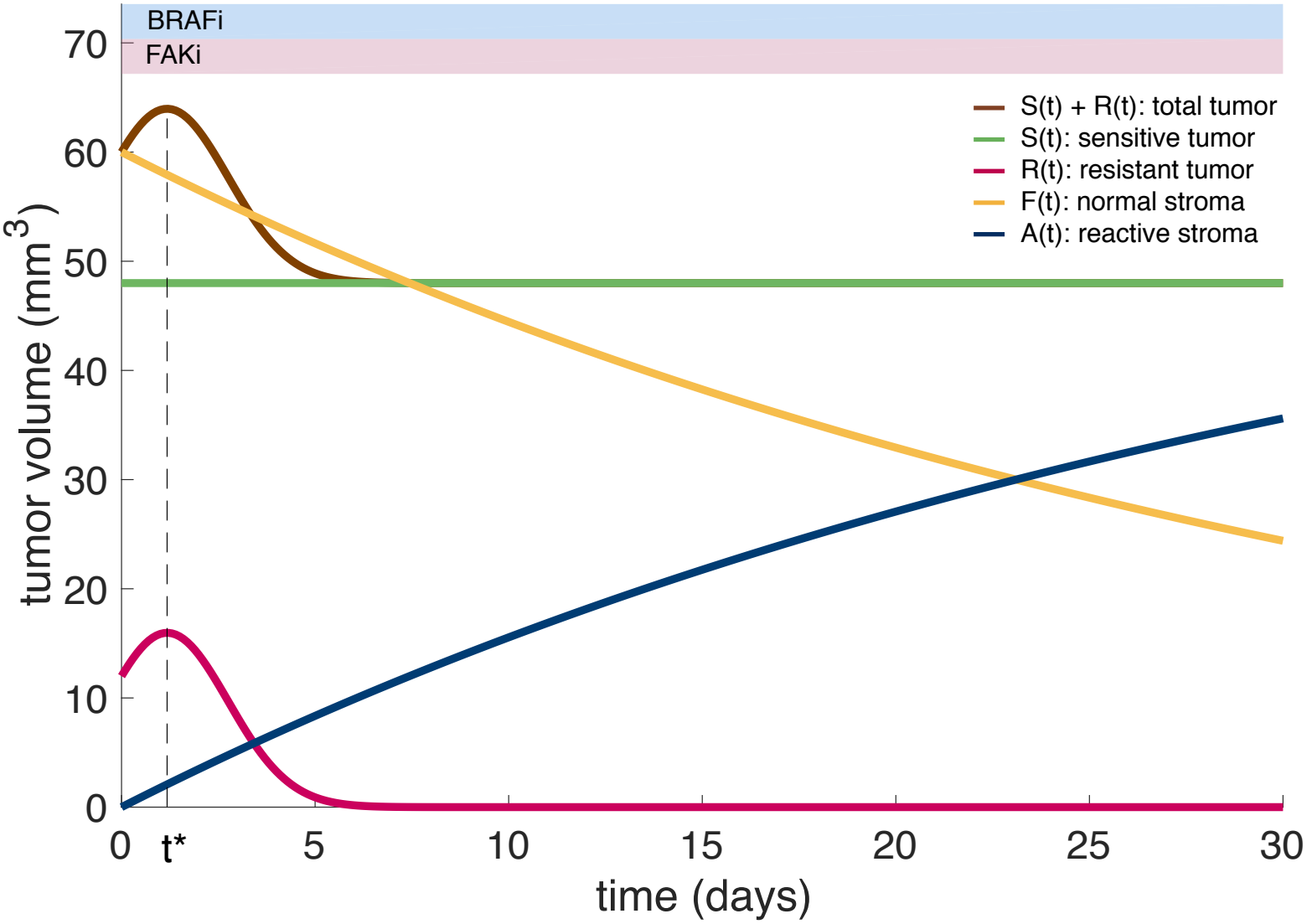

BRAFi
FAKi
5000
4000
3000
2000
1000
0
tumor volume (mm3)
0
5
10
15
20
25
30
time (days)
S(t) + R(t): total tumor
S(t): sensitive tumor
R(t): resistant tumor
F(t): normal stroma (2x10-2)
A(t): reactive stroma (2x10-2)

Figure S7


BRAFi
FAKi
S(t) + R(t): total tumor
S(t): sensitive tumor
R(t): resistant tumor
F(t): normal stroma
A(t): reactive stroma
tumor volume (mm3)
time (days)
0
t*
5
10
15
20
25
30
70
60
50
40
30
20
10
0

Supplemental Figure Legends

Figure S1.
Posterior distribution for $\tilde{\eta}$ as θ is varied, and average ρ_R value from previous estimate (Table 2). The lighter color violin plots correspond to the value used in the estimates reported in Figure 3C ($\theta = 0.03\ 1/day$). The intermediate and darker colored violin plots are obtained with $\theta = 0.165\ 1/day$ and $\theta = 0.3\ 1/day$, respectively.

Figure S2.
Posterior distribution for K as ρ_S is varied within the range of estimates obtained with fit to *in vitro* data of corresponding cell line. The lighter (darker) colored violin plots are obtained with ρ_S value corresponding to the lower (upper) bound of the range reported in Table 2. The intermediate color violin plots correspond to the average ρ_S value, and correspond to those reported in Figure 3B.

Figure S3.
Posterior distribution for $\tilde{\eta}$ as ρ_R is varied within the range of estimates obtained with fit to *in vitro* data of corresponding cell line. The lighter (darker) colored violin plots are obtained with ρ_R value corresponding to the lower (upper) bound of the range reported in Table 2. The intermediate color violin plots correspond to the average ρ_R value, and correspond to those reported in Figure 3C.

Figure S4.
Posterior distribution for $\tilde{\eta}$ as K is varied (purple) and K as $\tilde{\eta}$ is varied (yellow). Mouse VII, cell line 4434, treated with BRAFi. Purple violin plots show probability density functions (x axis) of $\tilde{\eta}$ estimates (y axis) for a given value of K. Yellow violin plots show probability density functions (y axis) of K estimates (x axis) for a given value of $\tilde{\eta}$. The intensity of the color of each violin plot is proportional to the goodness of the fit (norm-2 distance between data and fit). $\theta = 0.03\ 1/day$. ρ_R from previous estimates (Table 2).

Figure S5.
In vivo data and fit for 5555 mice XIII through XXII, treated with PLX4720 (BRAFi) and PF562271 (FAKi). Note different y axis scales. Data from [13].

Figure S6.
Example of case 1. Model parameterized on mouse IX of cell line 5555. $\rho_S = 0.66325\ \ 1/day$, $\rho_R = 0.49543\ \ 1/day$, $K = 4818.62\ \ mm^3$, $\tilde{\eta} = 26.876\ \ 1/day$, $\tilde{\alpha} = 14.4\ \ 1/day$, $\theta = 0.03\ \ 1/day$, $S_0 = 48\, mm^3$, $R_0 = 12\, mm^3$, $F_0 = 60\, mm^3$, $A_0 = 0\, mm^3$. The tumour burden (brown) is monotonically increasing under treatment combination of BRAFi and FAKi.

Figure S7.
Example of case 2. Model parameterized on mouse VII of cell line 5555. $\rho_S = 0.66325\ \ 1/day$, $\rho_R = 0.49543\ \ 1/day$, $K = 4818.62\ \ mm^3$, $\tilde{\eta} = 0.1257\ \ 1/day$, $\tilde{\alpha} = 14.4\ \ 1/day$, $\theta = 0.03\ \ 1/day$, $S_0 = 48\, mm^3$, $R_0 = 12\, mm^3$, $F_0 = 60\, mm^3$, $A_0 = 0\, mm^3$. Under treatment combination of BRAFi and FAKi, the tumor burden (brown) is monotonically decreasing after time $t^* = 1.1771\ day$.