

NOT TO SCALE

MOUSE  
HIPPO  
DOG

$R_{LEG}$  - RADIUS OF LEG

FORCE  $\propto$  AREA

$$F \propto A$$

$$F = k A^2$$

$$\propto R_{LEG}$$

$R_{BODY}$  - RADIUS OF BODY

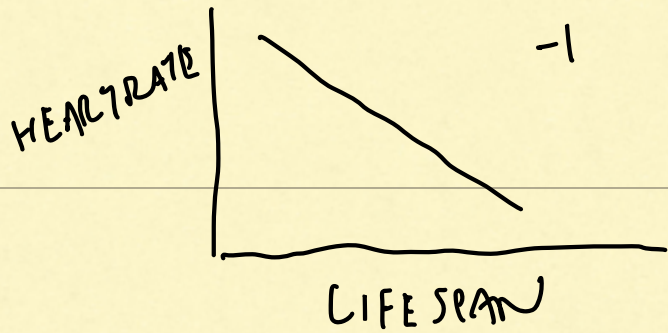
WEIGHT  $\propto$  VOLUME

$$R_{BODY}^3$$



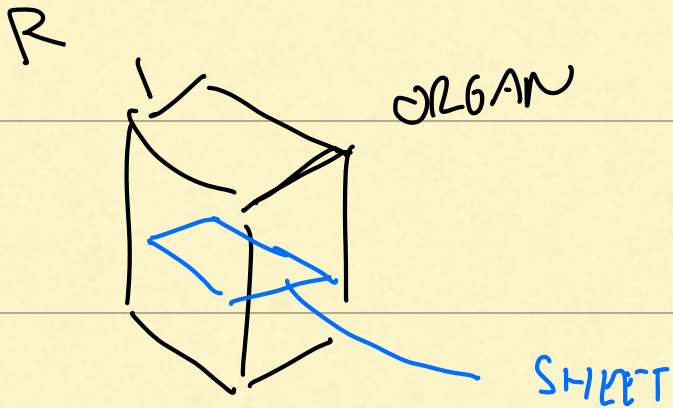
$$R_{LEG} \propto R_{BODY}^{2/3}$$

# ALLOMETRIC SCALING



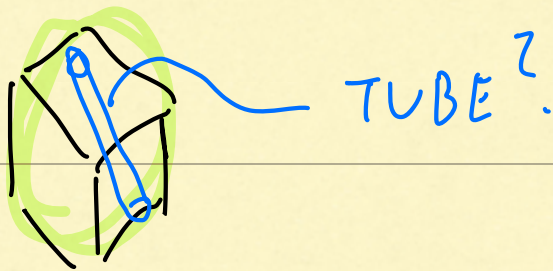
ORGANS: LUNGS, KIDNEY

$C$  - RATE OF REACTION



$$M - \text{MASS} \\ \propto V \propto R^3$$

$$C \propto R^2 \\ \propto M^{2/3}$$

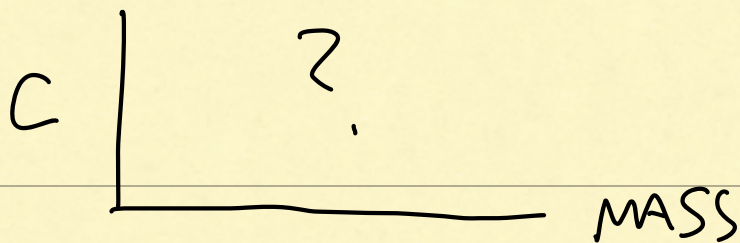


$$C \propto R \\ \propto M^{1/3}$$

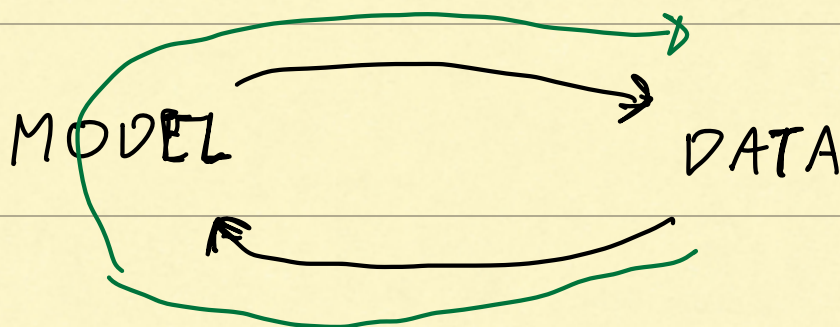


$$C \propto R^3 \\ \propto M$$

# DRUG CLEARANCE RATE C



EXPORT?



$$C \propto M^\alpha$$
$$C = k M^\alpha$$

$$p(C; \theta) = L(\theta; c)$$



MAXIMIZE  $L$



IF  $p \sim$  GAUSSIAN i.i.d.



THEN MAXIMIZE  $L \Rightarrow$

LEAST SQUARES

IF LINEAR IN  $\Theta \Rightarrow$

THEN ORDINARY LEAST SQUARE

OR LINEAR REGRESSION

ANACONDA :

VSCODE : 3 windows  
MAC

RSTUDIO : windows  
MAC