



Ivermectin PK/PD

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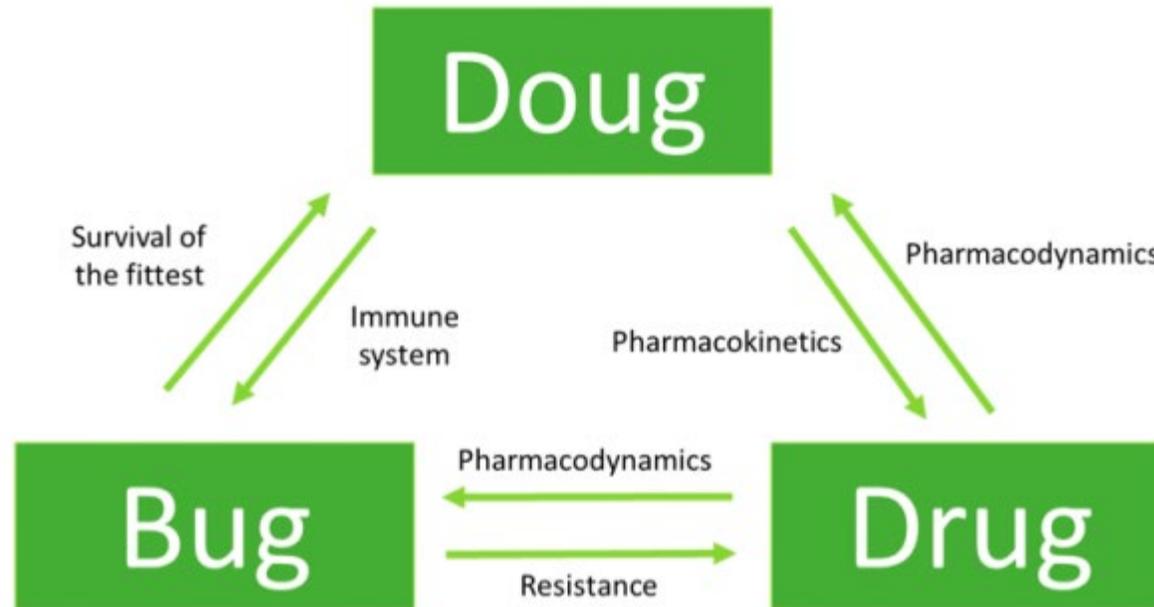
Ivermectin

Antiparasitic agent

Max dose for strongyloidiasis is 200 mcg/kg/dose once daily for 1 two days

16 mg (80 kg) to 40 mg (200 kg)

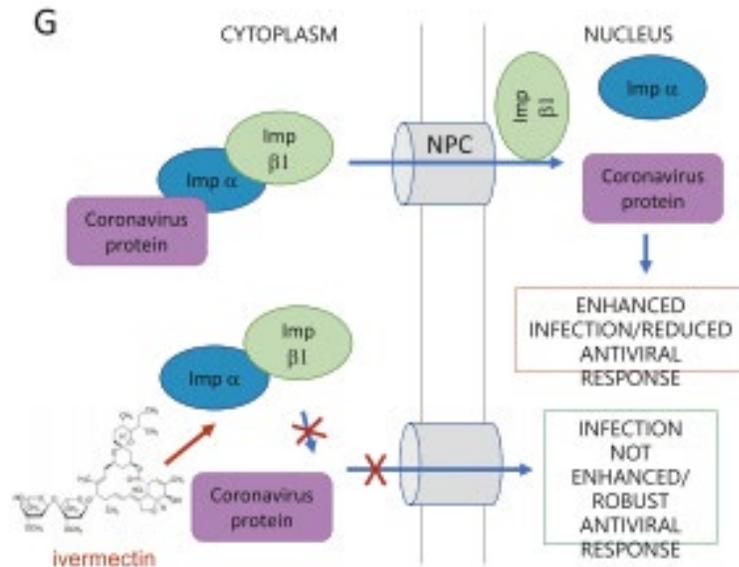
PK/PD of antimicrobials



Viral Diseases and Co-infection

- Pharmacokinetics- effect of body on the drug
 - Absorption, distribution, metabolism, excretion
- Pharmacodynamics
 - Effect of drug on bug
 - Effect of drug on body (toxic effect)
- IC50- concentration needed to reduce viral load by 50 %

Pharmacology against COVID



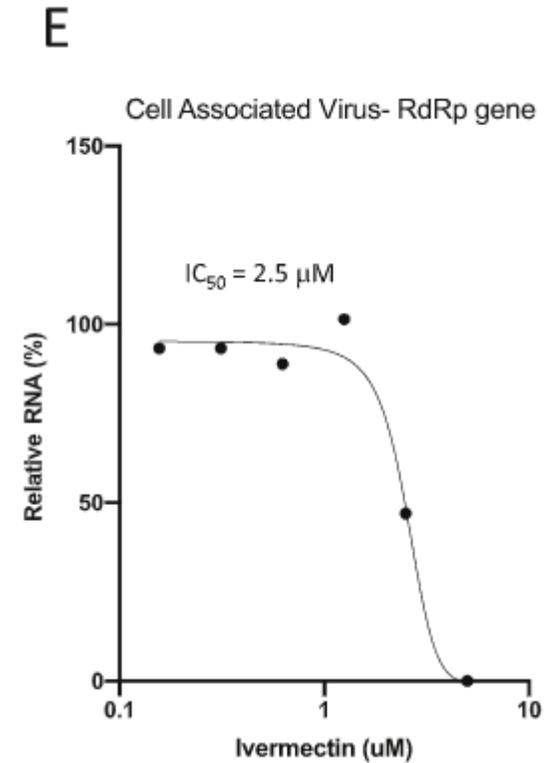
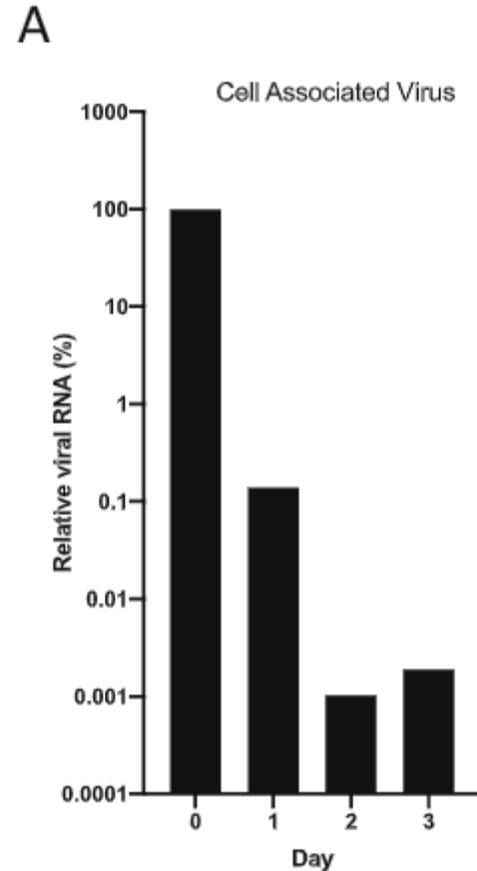
Possibly interferes with importin (IMP) $\alpha/\beta 1$, proteins involved with bringing SARS-CoV-2 proteins into the nucleus

Invitro data

Antiviral activity of ivermectin was analyzed against slam cells for using 5 micromoles of ivermectin

Virus decreased by > 99%

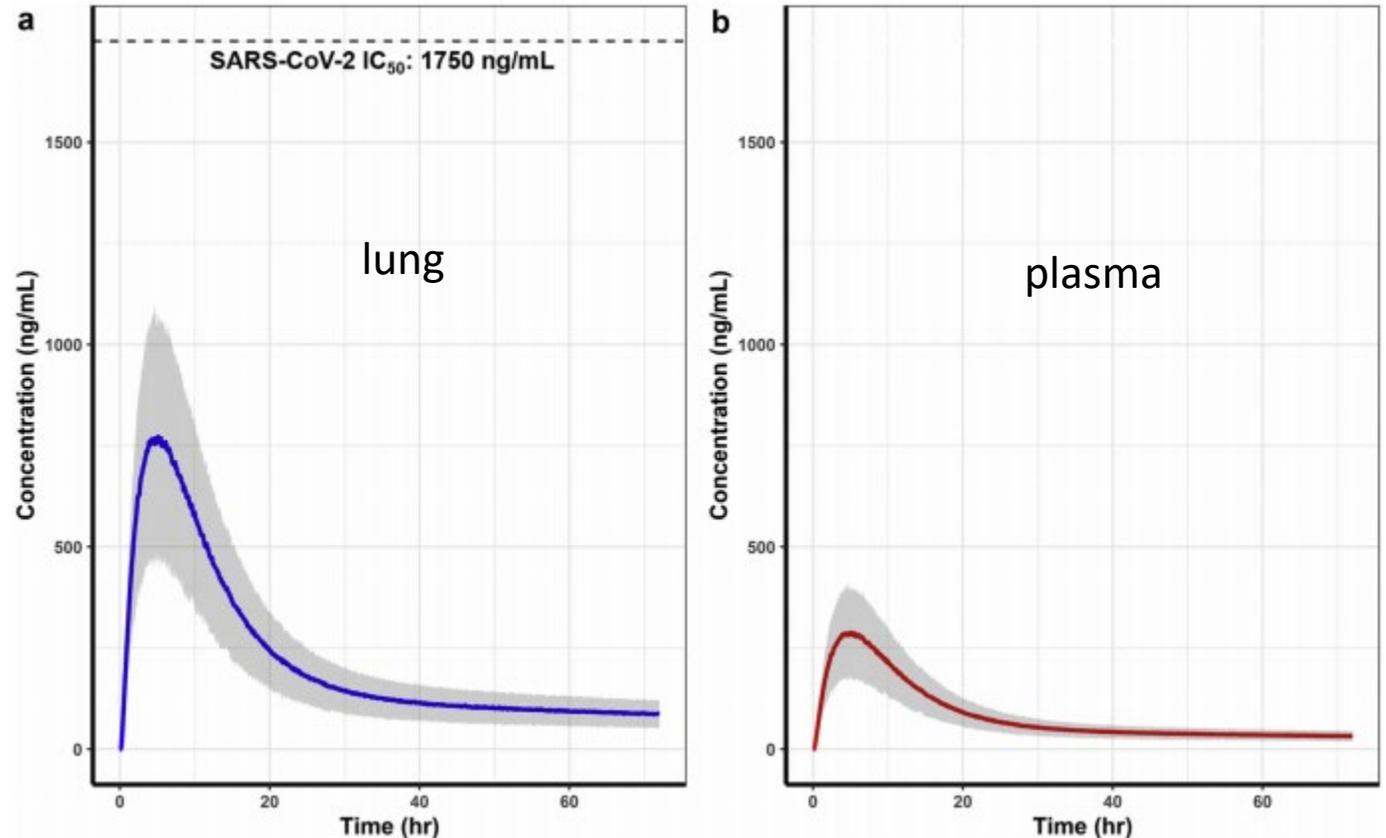
IC50 of 2.5 mmol (2190 ng/ml)



PK model 1

Used human pharmacokinetic data from phase 1 trials and calf data on lung penetration to model ivermectin concentrations

Peak lung concentration of 772 ng/L using 120 mg dose



Various dosing regimens

Another PK model investigated

repeated doses

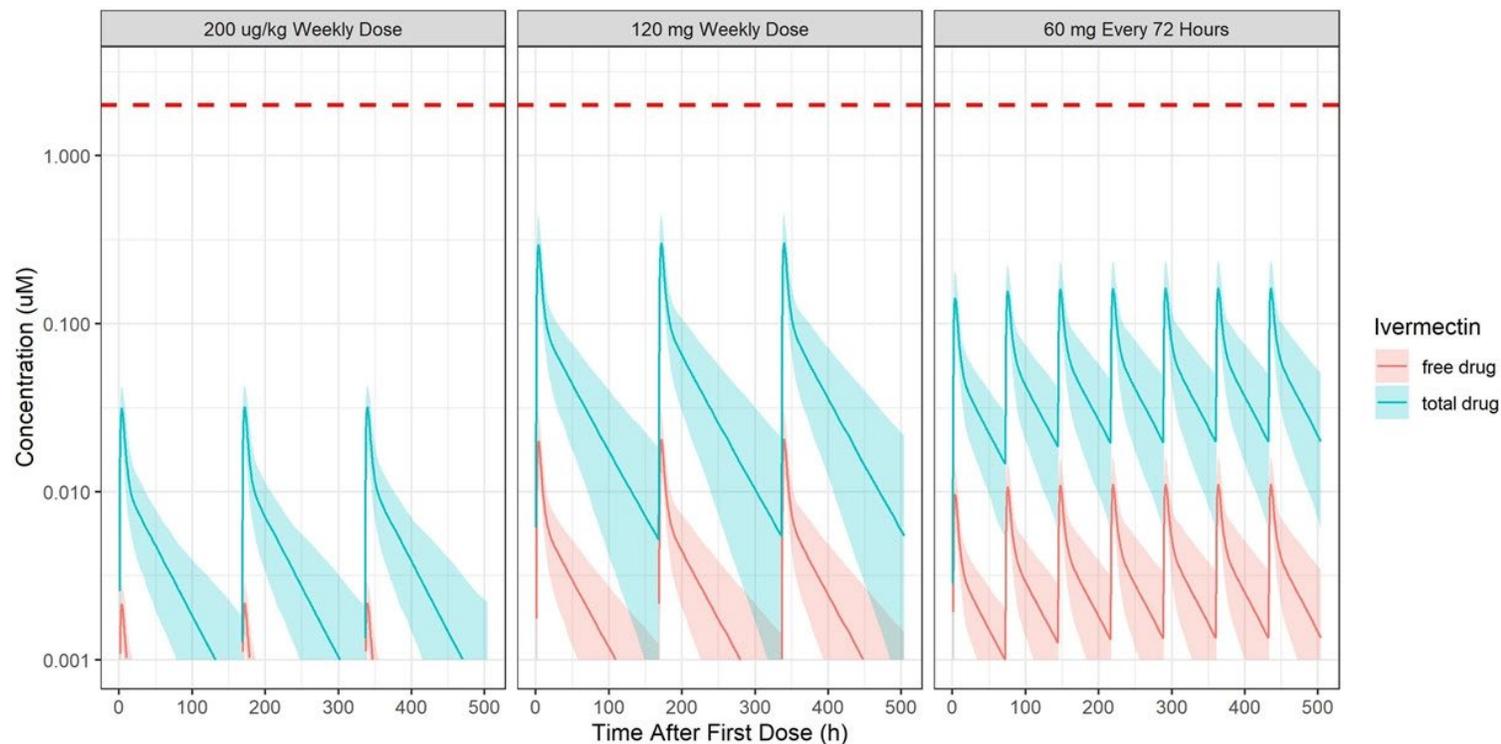
200 mcg/kg weekly

120 mg weekly

60 mg every 72 hours

Similar to previous study-

subtherapeutic levels in lung



PK Conclusion

Need 2190 ng/ml to have antiviral affect of ivermectin

Models of 10 times normal dose show peaks of 772 ng/mL in lung

Only 1/3 of the way there

Limited safety data on higher doses (n=12 in phase 1 trial) on 120 mg

Closing Thoughts

- Ivermectin will not reach the concentrations in humans needed to inhibit SARS-CoV-2
- Concentrations needed require multiple times normally given doses
- As Dr. Scheid will discuss- clinical studies are methodically flawed.
- Not currently recommended by IDSA or NIH
- “ivermectin as an antiviral is in a very early phase – under no circumstances should self-medication be considered without the guidance of a qualified physician, and especially not using therapeutics designed for veterinary purposes!” Dr. Caly

More resources

Society of infectious diseases pharmacists COVID-19
therapeutic reviews

<https://sidp.org/covid19therapeuticreviews>