Drug Resistance of Parasites

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Amoebiasis

- ~50 million per year of *E. histolytica*
- Trifluoromethionine
- Cross-resistance, adhesion, and gene targeting
- Resistance mechanism
  - Methionine Ŷ-lyase (MGL) silenced
    - ehMGL
- Engineering a drug
Leishmaniasis

- ~12 million people infected
- Zoonotic and anthroponotic
- Last 20 yrs increased resistance
- Overuse/misuse of antimonial drugs
- Mechanism of resistance unclear
- HIV/VL coinfectected patients possible threat
  - *L. donovani* and *L. tropica*
  - Miltefosine, Paramomycin, and L-AmB
Cestodes and Trematodes

- +100 million cestode cases
  - Echinococcus sp excluded
- ~230 million trematode cases
  - *Paragonimus westermani*
- Resistance mechanism PZQ
  - Unclear
  - $Ca^{2+}$ ions influx, adenosine receptor blockage?
- Lab induced resistance only
Nematodes

- ~650 million symptomatic per year
- ~4,300 million asymptomatic estimated
- MicroRNAs
  - Cancer cell trigger
  - Developmental timing in nematodes
- Concern
  - Livestock
  - Pets
  - Zoonotic opportunities
Pediculosis

- 2-10% of human population infected
- Emerging threat
- 1 case found
  - Pyrethrins resistant
  - 2%5 Permethrin effective dose
- Concern
  - Exponential growth of resistance
  - Host Fitness
    - Chemicals, carcinogens, toxins
Prevention

• Effective treatments
  – Money, availability, education,

• Research
  – Gene targeting
    • Coding, suppression/expression
  – Lab replications
  – Cultured test organisms
  – DNA testing

• Losing battle
Questions?
Sources


http://www.fda.gov/AnimalVeterinary/SafetyHealth/ucm366310.htm

http://www.path.cam.ac.uk/~schisto/general_parasitology/parasitology_general_humaninfections.html


