

## Ecology of LAC Encephalitis Virus in Western North Carolina: Anthropogenic Effects - Gideon Wasserburg

- 1) Ecological approach
  - a) Look at interactions between ecological systems and infectious agents
  - b) Look at distribution and abundance of disease agents
- 2) Why does disease occur?
  - a) Overlap between disease, agent, host, and vector
  - b) Proper ecological conditions
- 3) Approach is:
  - a) Holistic
  - b) Mechanistic
  - c) Predictive
- 4) Looking for correlates of risk
- 5) Current focus is on how humans affect the environment and the risk of arboviral diseases
  - a) Original study system was cutaneous leishmaniasis
    - i) Rat-sand fly system with humans as an incidental host
    - ii) Study done in Israel
    - iii) Model
      - (1) Increase in soil moisture due to human disturbance
      - (2) Increased abundance of host and vector
      - (3) Spillover into humans
  - b) Current study is LAC encephalitis virus
    - i) Small mammal-mosquito system with humans as an incidental host
    - ii) Vertical and venereal transmission play a factor
    - iii) Study question - Is apparent increase in LAC associated with changes in landscape use?
    - iv) Looking at *Oc triseriatus* and *Ae albopictus*
    - v) Possible mechanisms
      - (1) Effect on vector abundance
      - (2) Effect on vector survival
      - (3) Effect on host abundance
    - vi) Study design
      - (1) 6 historic case sites
      - (2) Sampled mosquitoes using gravid traps
      - (3) Collected resting mosquitoes using an aspirator
      - (4) Egg counts
    - vii) Environmental variables
      - (1) Abundance of containers
      - (2) Plants
        - (a) Type
        - (b) Coverage
        - (c) Size
    - viii) Preliminary results
      - (1) Egg laying

- (a) Increase in number of eggs correlates to an increase in number of water-holding containers
- (b) No difference between number of eggs seen in peridomestic and forest habitats
- (2) Bloodmeal and gravidity vary among species and location
- (3) Additional analyses are forthcoming
- ix) Conclusions to date
  - (1) No clear-cut anthropomorphic effect
  - (2) Definite effect - container abundance